James J. Johnston's

Apparatus for Treating Hydro Carbon Oils.

PATENTED JUL 25 1871

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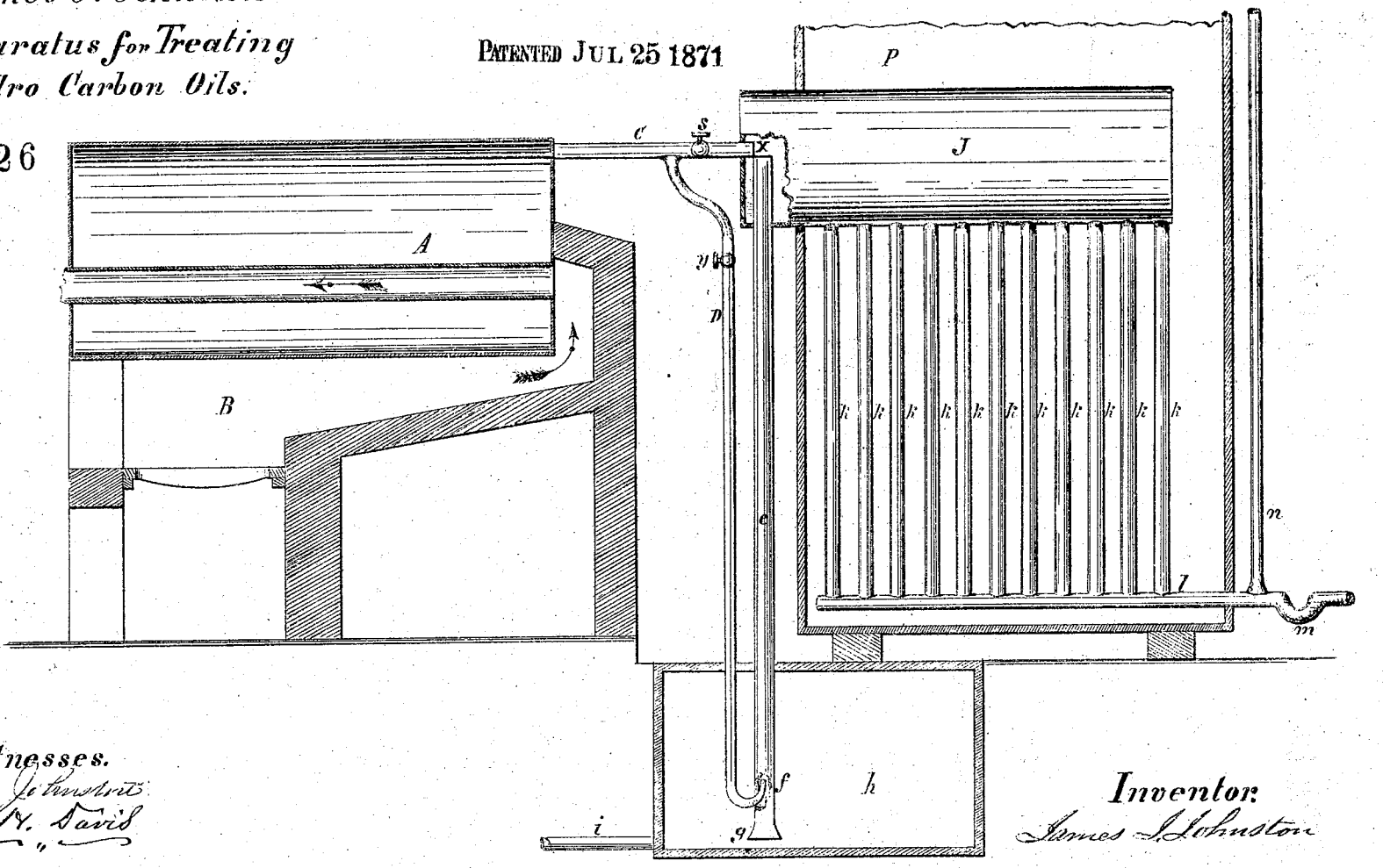

Witnesses.

A. Le. Johnston

Jos. H. Davis

Inventor.

James J. Johnston

UNITED STATES PATENT OFFICE.

JAMES J. JOHNSTON, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN PROCESSES AND APPARATUS FOR TREATING HYDROCARBON OILS.

Specification forming part of Letters Patent No. 117,426, dated July 25, 1871; antedated July 13, 1871.

To all whom it may concern:

Be it known that I, JAMES J. JOHNSTON, of the city and county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement for Treating Hydrocarbon Oils; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of my invention consists in treating hydrocarbon oils by the action of steam, through the medium of the apparatus hereinafter described, for the purpose of washing, purifying, deodorizing, and increasing the fire-test of said oils.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawing which forms part of my specification, A and B represent a vertical and longitudinal section of an ordinary steam-boiler and its furnace. To the steam-boiler A is attached a pipe, C, from which a pipe, D, projects downward into an oil-reservoir, *h*, and enters a pipe, *e*, as indicated at *f*, the lower end of which is bell-mouthed, as at *g*, and extends from near the bottom of the reservoir *h* to the lower edge and end of the pipe C, within the chamber J, to which is attached a number of pipes, *k*, the lower ends of which are connected with a pipe or chamber, *l*, the outlet of which is provided with a trap, *m*, and a pipe, *n*. The greatest portion of the chamber J, and all of the pipes *k* and pipe or chamber *l*, are immersed in water held in a tank or reservoir, P. The ends of the pipes C and *e* within the chamber J are arranged at right angles with each other, as indicated at *x*. The apertures or outlets at *x* of the pipes C and *e* should be made so that the steam and oil flowing from the pipes and apertures will be spread out in a broad thin sheet. The pipe C and its branch pipe D are provided with valves *s* and *y* for the purpose of regulating the flow of steam through them, and steam and oil through the pipe *e*.

As the construction and arrangement of the several parts of my improvement, and the relation that the various parts bear to each other, will be readily understood from the foregoing description and by reference to the accompanying drawing, I will therefore proceed to describe the operation, which is as follows: Steam flows from the boiler A through pipe C, the valves *s* and *y* are opened, giving the steam the lead in pipe D by opening the valve *y* a little in advance of valve *s*, the steam flowing from pipe C across the upper end of pipe *e*, and the steam flowing upward in pipe *e* from the pipe D will cause the oil in the reservoir *h* to be drawn up in pipe *e*, where it will be heated and thoroughly mixed with the steam and then pass out at the upper end of pipe *e*, where it comes in contact with the steam flowing out at the end of pipe C, which will spread the mixed steam and oil out into a thin sheet of fine spray or vapor, which, coming in contact with the sides of the chamber J and the pipes connected thereto, will be condensed, and the water and oil, the product of condensation, will flow out through the trap *m* of the chamber or pipe *l* into a suitable vessel or reservoir, where it is allowed to remain until the oil and water become separated from each other. The fixed gases common to the oil pass off through the pipe *n*. The oil may flow from the condenser connected with the still through pipe *l* into the reservoir, from which it is drawn up for treatment, as herein described. By subjecting distilled or crude hydrocarbon oils to the action of steam in the manner and by the means hereinbefore described it will heat it and divide it into a fine spray or vapor, so that each minute globule or particle of oil will be submitted to the solvent property of the steam, which will wash, purify, clarify, deodorize, and separate the oil from its inflammable gases, increasing the fire-test of the oil and also its burning qualities. By treating oil as hereinbefore described the use of alkali and acid is avoided, and by dispensing with the use of alkali and acid the cost of refining hydrocarbon oil will be greatly diminished and the product of refined oil increased.

I wish it clearly understood that I do not claim, broadly, subjecting oil to the action of steam.

Having thus described the nature, construction, and operation of my improvement, what I claim as of my invention is—

The combination of the pipes C, D, and *e*, constructed and arranged with relation to each other and a condenser, substantially as herein described and for the purpose set forth.

JAMES J. JOHNSTON.

Witnesses:
A. C. JOHNSTON,
JOS. H. DAVIS.