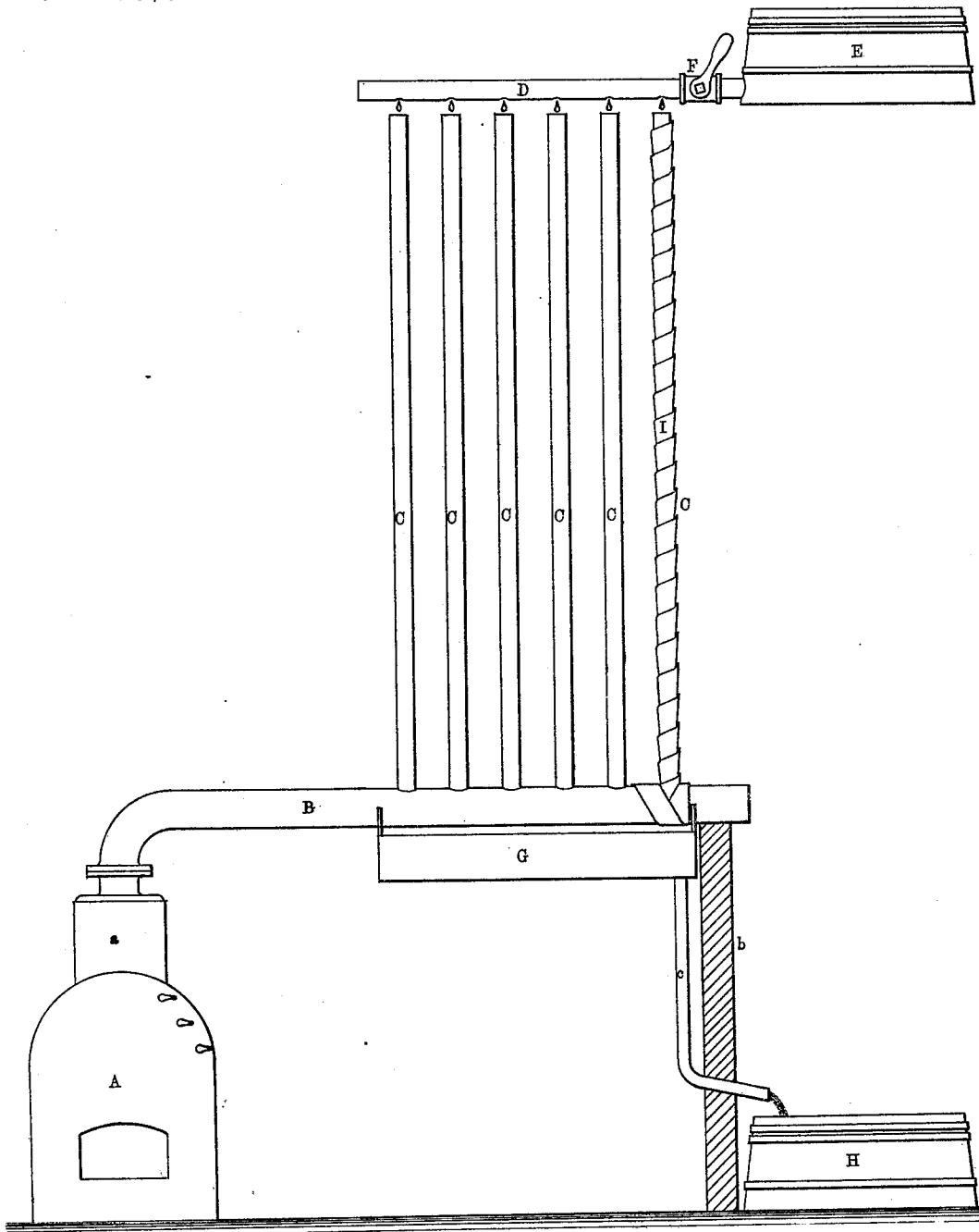


W. H. BIRGE.

APPARATUS FOR INCREASING THE DENSITY OF OILS, &c.

No. 175,014.

Patented March 21, 1876.



—WITNESSES—

Wm. W. Townson

W. H. Wharton

—INVENTOR—

William H. Birge,

by G. H. W. Howard,
his atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. BIRGE, OF FRANKLIN, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR INCREASING THE DENSITY OF OILS, &c.

Specification forming part of Letters Patent No. **175,014**, dated March 21, 1876; application filed February 7, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. BIRGE, of Franklin, Venango county, Pennsylvania, have invented certain new and useful Improvements in Apparatus for Increasing the Density of Hydrocarbon Fluids, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and the letters of reference marked thereon.

My invention relates to means for increasing the specific gravity or density of the crude hydrocarbons, by the evaporation of a portion of the lighter constituents of the fluid in its passage from a reservoir to a tank or other receptacle, as hereinafter fully described.

In the drawing, forming a part of this specification, A represents an ordinary steam-boiler, and B a steam-pipe, secured to the top of the steam-drum *a* of the boiler, and closed at the outer end, which is supported by a wall, *b*. C C are pipes, closed at their upper ends, and extending vertically, or nearly vertically, from the pipe B to near a pipe, D, leading from the crude-oil reservoir E. The pipe D is provided with a cock or valve, F, to regulate the flow of the crude oil from the reservoir, and perforated on the under side thereof directly over the closed ends of the vertical pipes C. G is a tray or trough placed under the main steam-pipe B, with a discharge-pipe, *g*, leading therefrom to the tank H. I is a strip of flexible and porous material wrapped around the pipes B and C, for purposes hereinafter described.

The steam-pipes B and C are heated by steam generated in the boiler A, the water

resulting from the condensation of steam flowing back to the boiler to maintain the proper water-level therein. Upon the opening of the cock F, the only escape for the crude oil, the end of the pipe D being closed, is through the perforations in the under side thereof, from which perforation it drops or flows to the top of the pipes C. The wrapping of the steam-pipes with flexible and porous material, as before alluded to, is to spread the oil over the heated surface and retard its progress down the pipe; it also increases the effective heating-surface. The size of the apertures or perforations in the pipe D, and the diameter and height of the pipes C, are so arranged and proportioned as to deliver the oil to the tray at the required density, and in a condition ready for shipment.

Although I have described my invention as applied to the manipulation of petroleum, it is applicable to any liquid the density of which is to be increased, among which may be mentioned sea-water in the production of salt.

I claim as my invention, and desire to secure by Letters Patent of the United States—

The boiler A, closed-ended pipes B and C, wrapped with porous flexible material, as described, the perforated closed-ended reservoir, discharge-pipe D, and trough G, leading to the condensed-oil tank, all combined substantially as and for the purpose specified.

In testimony whereof I have hereunto subscribed my name this 20th day of December, A. D. 1875.

WILLIAM H. BIRGE.

Witnesses:

THOS. ELLIS,

JOHN R. McCAUGHTRY.