

HENRY H. EDGERTON.

Apparatus and Process for Separating Vapors from Gasses.

No. 117,998.

Patented August 15, 1871.

Fig. 1.

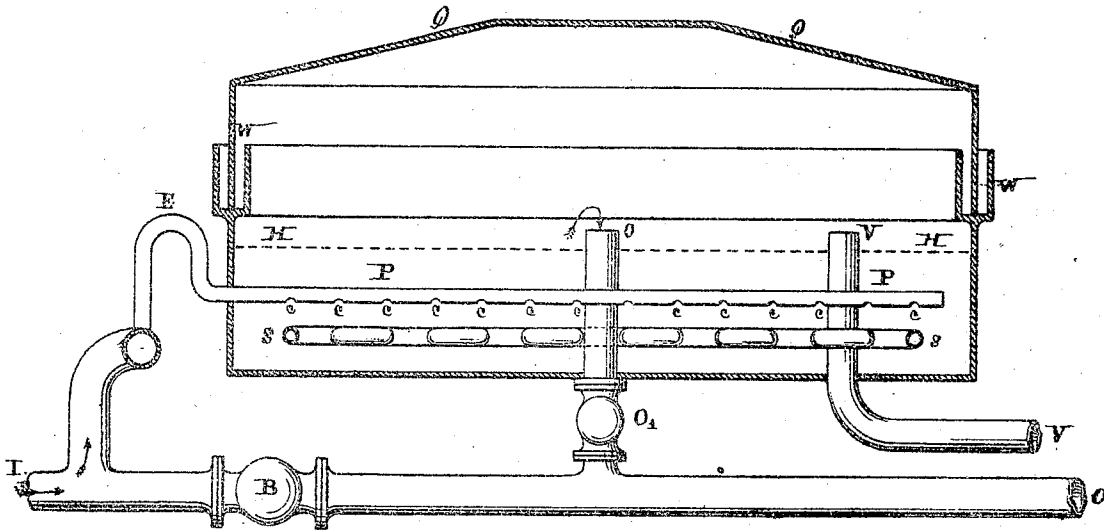
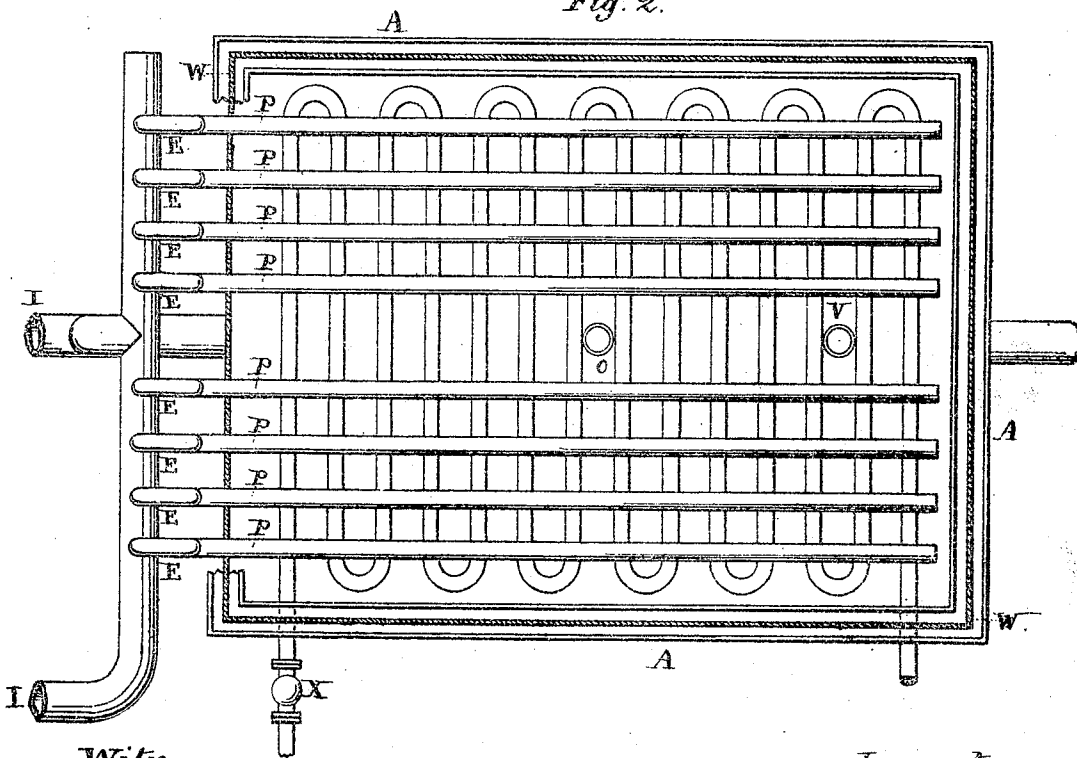


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY H. EDGERTON, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN METHODS AND APPARATUS FOR SEPARATING CERTAIN HYDROCARBON VAPORS FROM ILLUMINATING-GASES.

Specification forming part of Letters Patent No. 117,998, dated August 15, 1871.

To all whom it may concern:

Be it known that I, HENRY H. EDGERTON, of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in, or Method of, and Apparatus for Washing Gases; and I hereby declare the following to be a full, clear, and exact description of the same.

The object of this invention is to remove from rich illuminating-gases, such as hereinafter referred to, certain hydrocarbon vapors, the presence of which prevents the gases from burning without emitting greater or lesser volumes of smoke, or without necessitating the admixture of an excessive quantity of air; and I have accomplished my object by forcing such gases through or over certain hydrocarbon liquids denuded of their more volatile constituents, substantially as hereinafter shown and described.

To enable others to make and use my said invention, I shall now describe the manner in which the same is or may be carried into effect.

Referring to the accompanying drawing—in which Figure 1 is a sectional elevation, and Fig. 2 a plan view of an apparatus constructed in accordance with my invention—

A is a rectangular reservoir, covered with the cover Q, dipping into a water-seal, W, as in an ordinary gas-purifying box. This box is fitted with a gas-inlet, I, and outlet O, with a by-pass valve, B. The gas is distributed in the washing-pan by the pipes P, of which eight are represented in plan, the section showing the elbow E above the level of the washing-liquid H, and the small apertures *c* below the level of the washing-liquid. A gridiron of steam-pipes, S, lying on or near the bottom of the pan, with its inlet-valve X, completes the apparatus.

The washing-liquid is any hydrocarbon boiling at a suitably high temperature, generally above 200° Fahrenheit, (in winter 250° to 300° Fahrenheit will do better.) It is important that the liquid contains no element boiling below 200° Fahrenheit, though lower than that will answer in a degree. It is recommended to use crude petroleum from which all volatile hydrocarbons are expelled, with superheated steam at 300° or steam under pressure of forty-five to sixty pounds. Such liquid is introduced to a suitable level, H. The by-pass valve B being then closed, the gases pass, by the holes or perforations *c*, through the washing-

liquid, and are then deprived of any excess of hydrocarbon vapors, whereby the gases may be afterward burned in suitable burners without smoke. This system of washing is more particularly applicable to naphtha or petroleum-gases, which contain so large a proportion of hydrocarbon vapors as to be burned with difficulty, in many cases necessitating an admixture of air to clear the flame of smoke, to the great detriment of the illuminants. The use of air is clearly detrimental; the smoking of the burner is equally detrimental; but by using this washer a sufficient quantity of the richer hydrocarbon vapors is retained to enable the gas to be burned pure in a suitable burner. The use of the steam-pipes S in this machine is for the purpose of driving off the volatile hydrocarbons through the vapor-pipe V, which pipe connects with some suitable condenser or refrigerator.

The operation of driving off the volatile hydrocarbons is performed by opening the by-pass B, closing the valve O, and allowing steam to pass by the valve X through the gridiron steam-pipes S, and opening a valve in the vapor-pipe V. When the hydrocarbons vaporizing below 200° to 300° Fahrenheit are vaporized the steam may be shut off, cold water may be passed (if expedient) through the pipes S by an independent connection, and the by-pass B being closed, the gas again passes through the washing-pan. It would be advisable to use an alternate washing-pan.

I am aware that gases are passed at present through dense hydrocarbon liquids, viz., through the hydraulic main of coal-gas works, but not for the purpose of condensation or washing, but for the purpose of sealing the gas and preventing its return, and the incidental condensation or washing that there occurs is ineffective. It is not necessary to state that it is an object of importance generally in the production of gases to retain such hydrocarbon vapors with the gas until it be consumed, and to prevent all condensation or abstraction of vapors, except the more dense coal-tar vapors. For this purpose I would point out that, in cold climates, gas-holders are frequently covered. I would also point out that with coal-gas the best authorities are of accord that condensation must not be carried too low. In the production of naphtha or petroleum-gases, however, the reverse is true—that is, all hydrocarbon vapors it is desirable to remove. The illu-

minant gases of a permanent nature, as olefiant and butylene gases, are in such quantity that any hydrocarbon vapors present tend to make the gas smoke, but by removing them the flame is at once cleared of smoke. These vapors are not readily removable by condensation, but by this novel plan of washing nearly all are removed.

I am aware that gases are brought in contact with hydrocarbon liquids to increase the illuminating power. This, of course, is separate and distinct from my plan of washing, though after carbureting gas has taken place to a certain extent, and all the lighter vapors are carried off, a reverse process sets in, by which the passing gases are denuded of portions of their vapor and impoverished, yet, in the case of carbureting, the intent is exactly the reverse of my plan of washing, though absorbing the vapor previously present in the gases may incidentally occur.

It is plain that trays or shelves may be arranged within my washing-pan, over which may be layers of cotton saturated with hydrocarbon liquids, accomplishing the same purpose, though in a less

perfect degree. This plan may be adopted when it is required to run without any back pressure caused by the gas bubbling through the petroleum. The steam in this case should be let directly into the body of the pan for the purpose of vaporizing the light hydrocarbon vapors absorbed by the petroleum.

Having thus described my invention, I claim—

1. As an improvement in the manufacture of naphtha, petroleum, or other rich illuminating-gases, the forcing the same through or over petroleum or other hydrocarbon liquids denuded of their more volatile constituents, for the purpose of absorbing any hydrocarbon vapors that may be present.

2. The herein-described apparatus, arranged for operation substantially in the manner and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

Witnesses: HENRY H. EDGERTON.

A. A. ALVORD,

B. F. LEE, JR.