

(No Model.)

C. W. BLODGET.

APPARATUS FOR SIMULTANEOUSLY SCRUBBING, PURIFYING, AND
CONDENSING GAS.

No. 516,344.

Patented Mar. 13, 1894.

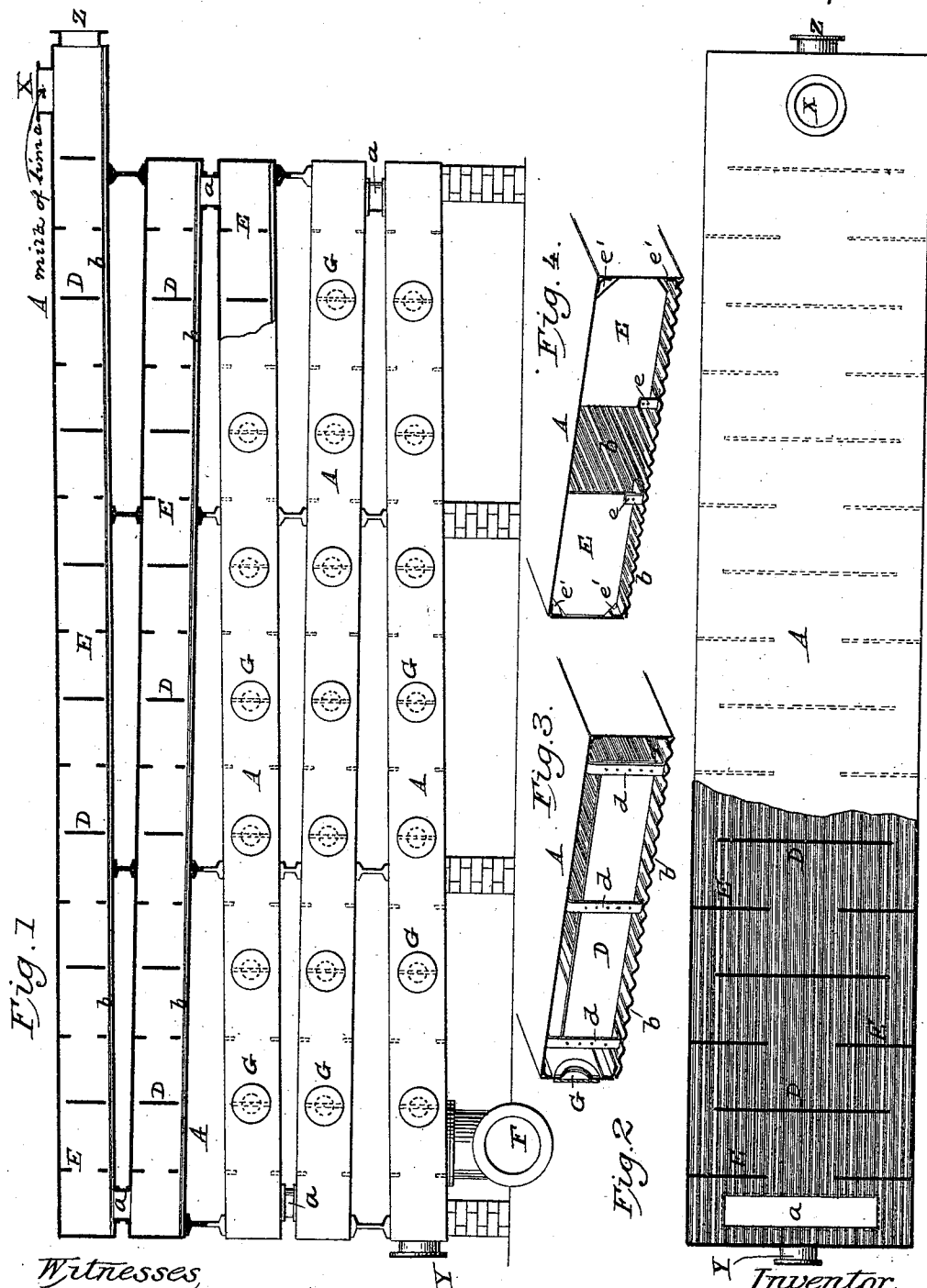


Fig. 1

Fig. 4.

Fig. 3.

Fig. 2

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SIMULTANEOUSLY SCRUBBING, PURIFYING, AND CONDENSING GAS.

SPECIFICATION forming part of Letters Patent No. 516,344, dated March 13, 1894.

Application filed May 12, 1893. Serial No. 474,020. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLIAMS BLODGET, a citizen of the United States, residing at New York, in the county and State of New York, have invented an Improvement in Apparatus for Simultaneously Scrubbing, Purifying, and Condensing Gas, of which the following is a specification.

My invention relates to the treatment of gas produced by the distillation of carbonaceous matter, as coal or oil, or by the well known process in which steam is used in contact with incandescent carbonaceous matter.

In my invention I purpose accomplishing the scrubbing, purifying and condensing of such gas simultaneously and thereby affecting a material economy in the production, both in the running expense and cost of the plant.

The improved apparatus by which I purpose practicing my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation partly in section of a combined scrubber, purifier and condenser; Fig. 2 a plan view also partly broken away, and Figs. 3 and 4 are respectively detailed perspective views showing the alternately arranged solid or continuous diaphragms and deflecting diaphragms having central openings and the longitudinal corrugated bottom of the trough in which they are arranged.

The apparatus as shown is composed of a series of alternately reversely inclined closed troughs A, five being shown, arranged one above another and connected alternately at opposite ends where they converge by passages a. The bottoms of the troughs are longitudinally corrugated as indicated at b, but are left unobstructed so that the tar or other matter thrown down from the gas, as well as the purifying fluid, for instance milk of lime, may flow continuously therethrough from one trough to another and be discharged from the lower end of the bottom one. The gas, however, is caused to pursue a devious course, by means of a series of transverse diaphragms or partitions D E. The diaphragms are arranged in alternation within the troughs which are provided with apertures closed by suitable covers G, and placed at proper intervals to afford access for cleaning, &c. The dia-

phragms D are shown as constructed of oblong plates secured to bars or crossstraps d in such manner as to leave a free space around all four edges through which the gas may flow after impinging against the plates. The alternate partitions E are shown as divided centrally, and supported by straps or braces e, and with their upper and side edges relatively close to or against the top and sides of the troughs, leaving a space or passage at the bottom for the flow of the tar and purifying liquid and also a space at the center through which the gas passes and impinges against the adjoining solid partitions as above mentioned. The outer corners of the plates forming the diaphragm E are clipped diagonally as shown so as to leave spaces e'. The gas passing through the apparatus passes around the edges of the plates D and through the central openings in the partitions E, and impinging as it does against the solid plates D is thrown laterally against the walls of the trough and passes around the edges of the partition and through the central apertures in the perforated partitions. The impingement of the gas against the surfaces, and its friction thereon break up the globules of tar and the tar is thrown to the bottom of the trough along which it flows, being finally discharged at F. The milk of lime is admitted to the higher end of the upper trough at X and flows successively through the troughs, its even distribution in a film or layer of the proper thickness being insured by the longitudinal corrugations b. The gas may be admitted at Y at the lower end of the bottom trough and pass up successively through the troughs and be finally discharged purified and with the tar eliminated at Z. It might, however, be admitted at Z and pass through the apparatus in the same direction as the purifying liquid and be drawn out at Y. The tar thrown down from the gas, as above stated, flows down through the troughs as it is separated from the gas, and is discharged with the milk of lime at F. The tar being heavier than the milk of lime will naturally form the lower strata and flow in contact with the corrugated bottoms while the milk of lime being lighter will flow over the tar and in contact with the gas. At the same time the gas is condensed and is discharged

from the apparatus relatively reduced in volume, the heat thereof having been materially absorbed by the purifying liquid, which enters the apparatus cold or at normal temperature.

The method of operation, as well as the organization of the apparatus, will be plain from the foregoing description.

I am enabled by this invention at one operation to eliminate the tar from the gas, purify and condense it. Any desired number of troughs A may be used to accomplish the thorough separation of the tar and the complete purification of the gas.

The apparatus herein described is substantially like that shown in my patent, No. 460,300, granted September 29, 1891, with the exception of the corrugated bottom. This makes an important difference in the operation, however. My patent did not contemplate the use of a purifying liquid, and even if it had, the operation of that apparatus would differ from my present method in that the tar and purifying liquid would have flowed in a confused mixture over the plane bottom of the troughs, while in my present process, the tar, by reason of its greater specific gravity sinks into the furrows of the corrugations, and is covered by the purifying liquid which flows over it in a continuous stream.

In my improved apparatus, the gas, the tar and the purifying liquid all continuously traverse a series of inclined troughs of substantially uniform dimensions and escape at the ends only; nothing either entering or escaping from the troughs laterally. Moreover, the tar and purifying liquid traverse a uniform path while the gas impinges against the solid partitions and flows around them laterally, inwardly and outwardly, as well as upwardly and downwardly, thus attaining the maximum degree of travel practicable, affording greater time of exposure, and encountering a greater degree of condensing surface than would be possible in passing directly

through perforated partitions. The gas also impinges or is deflected directly down upon the purifying liquid at frequent intervals instead of merely flowing over and parallel with its surface. I am moreover enabled by my improvements to dispense with all jets, spraying devices, fans, pumps, pipes, seals, and such-like complicated apparatus, which is liable to get out of order, and requires power and expense to operate it; as well as with outside connecting pipes and valves except those at each end of the trough.

I do not broadly claim herein either the method of purifying gas by causing it to flow through an inclined trough; or the use of transverse deflecting-plates.

Having thus fully described my improvement, what I claim as new and of my own invention is—

The hereinbefore described gas condenser, purifier and scrubber, consisting of a series of superposed, continuous, closed troughs alternately inclined in opposite directions, having inlet and outlet openings for the gas and purifying liquid and connected at their approximating ends by pipes or ducts, each trough having a longitudinally corrugated bottom, and a series of transverse diaphragms arranged in alternate set or series one set being continuous with openings around all its sides, and the other open at the center and bottom but closed at the sides and top, as set forth, whereby the gas impinges at frequent intervals upon the deflecting-plates, as well as upon the top of the trough and upon the purifying material flowing over the corrugated bottom and the tarry matters which flow down in the depressions of the corrugations.

In testimony whereof I have hereunto subscribed my name.

CHARLES WILLIAMS BLODGET.

Witnesses:

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