

D. W. HUNT.
 Process for the Manufacture of Illuminating Gas.
 No. 207,420. Patented Aug. 27, 1878.

Fig. 1

Fig. 2

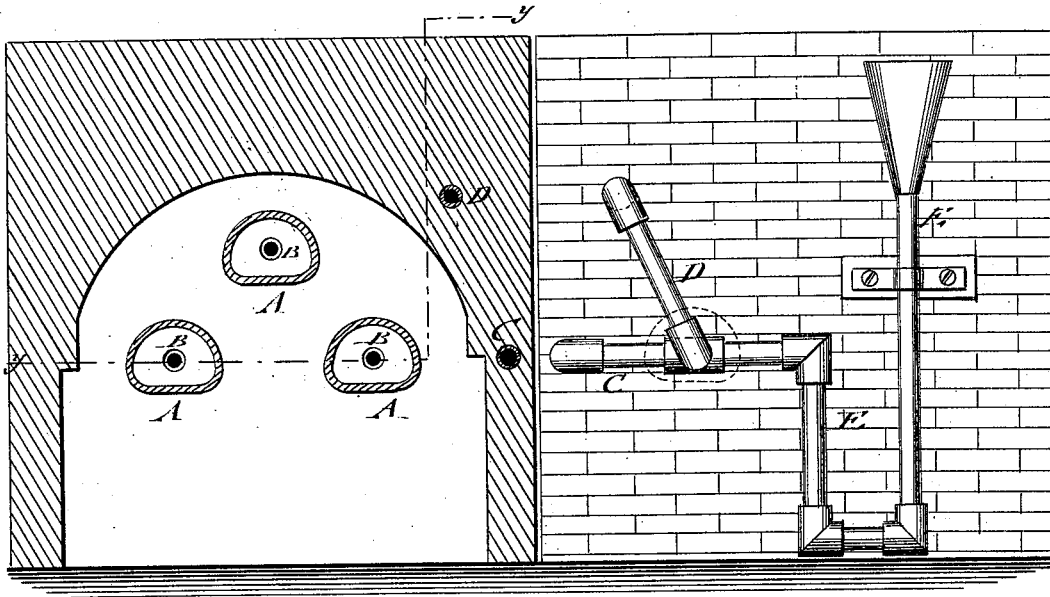
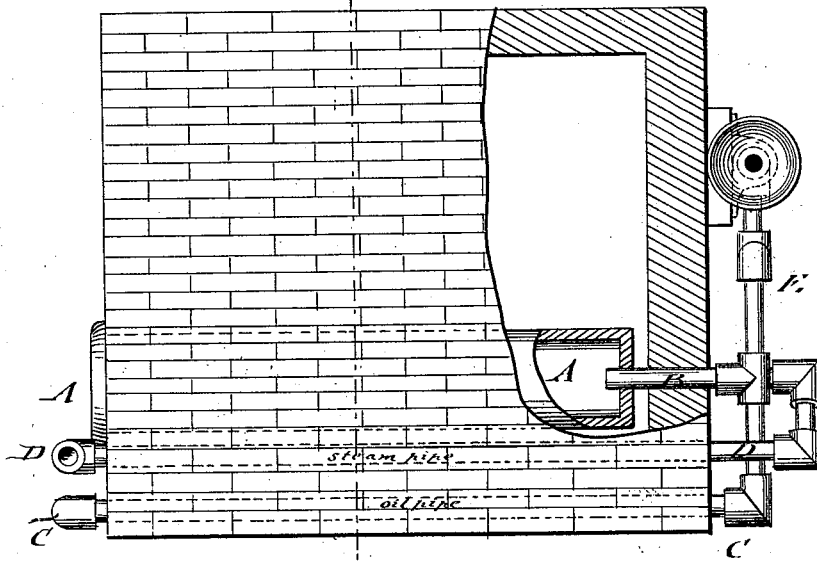


Fig. 3



WITNESSES:
C. Veroux
G. Sedgwick

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UNITED STATES PATENT OFFICE.

DANIEL W. HUNT, OF OSKALOOSA, IOWA.

IMPROVEMENT IN PROCESSES FOR THE MANUFACTURE OF ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **207,420**, dated August 27, 1878; application filed April 8, 1878.

To all whom it may concern:

Be it known that I, DANIEL W. HUNT, of Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Improvement in the Manufacture of Illuminating-Gas, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical transverse section on line *x x*, Fig. 3; Fig. 2, a rear elevation of the bench; and Fig. 3, a top view, partly in horizontal section on line *y y*, Fig. 1, of a bench of retorts with my improved pipe attachment for supplying steam, petroleum, and coal-tar to the same.

Similar letters of reference indicate corresponding parts.

The invention consists in utilizing coal-tar by distilling it, together with petroleum and steam, and converting the mixture into a fixed gas in a separate hot retort, and mixing this gas while hot with ordinary coal-gas, as hereinafter more fully described.

The vapors of the oil and tar mingle with the gas from the coal and with the decomposed steam, and unite and form a fixed gas of a higher illuminating-power.

Referring to the drawing, A represents a bench, which is arranged, for the purpose of illustration, with three retorts only, of which one or more, as the necessities of the work may require, are provided at the rear part with a supply-pipe, B, that branches out into three separate pipes, C, D, and E, of which pipe C extends from the front of the bench through the wall of the same, sidewise of the retorts, to the rear, and supplies the petroleum or other hydrocarbon, while the second pipe, D, extends through the bench and supplies steam, and a third pipe, E, in connection with a funnel, supplies a certain quantity of coal-tar.

The vertical arm of the siphon-shaped pipe E extends far enough above the inlet-pipe B of the retort that the columns of tar in the pipes below are overbalancing the back-pressure.

The quantity of tar is regulated by being dripped into a top funnel of the siphon-shaped pipe E from a pipe leading to a tar-tank, which is supported at any convenient place.

The oil-pipe is made to pass through the bench sufficiently near to the fire to be kept at about red heat, so that the oil is converted into vapors, and thrown with considerable

force with the steam into the retort, the steam and vapors taking up and carrying along the tar at the point of junction of the pipes, so as to throw it jointly with the steam and oil vapors into the retort.

In a bench of three retorts two are charged with coal in the ordinary way, while the other is conveyed by separate pipes the steam, oil, and tar, said pipes meeting in one before reaching the retort. At this junction the mixture takes place, which is now forced into the rear end of the retort. The gas which is then produced in this retort, and is one of great illuminating-power, is mingled with that flowing from the two coal-retorts as the gases pass through the exhauster to the condenser and through the purifying-boxes.

The common coal-gas made in the retorts is enriched by the supply of petroleum, coal-tar, and steam, that are jointly thrown into the retort, where the same is decomposed and the hydrogen of the steam united with the surplus carbon of the tar, so as to add thereby to the volume of illuminating-gas.

By adding about half a gallon of petroleum to form a thousand cubic feet of gas, the coal-tar obtained in a gas-factory may be added and utilized in effective manner, and thereby a richer illuminating-gas at less cost obtained.

The chief value of my invention consists in utilizing gas-tar (a waste product) for the purpose of enriching common coal-gas.

I introduce tar, petroleum, and steam to one of the heated retorts that is without coal, the others being charged with coal, as usual.

Too much steam with the gas will cause it to blow, and too little to smoke. By test the true quantity of steam is determined, and a governor set accordingly.

The relative quantity of oil to tar is as one to ten; but this small quantity is absolutely necessary to convert the tar into a fixed gas.

What I claim is—

In the manufacture of illuminating-gas, the process of utilizing coal-tar, which consists in distilling it, together with petroleum and steam, and converting the mixture into a fixed gas in a separate hot retort, and mixing this gas while hot with ordinary coal-gas, substantially as described.

DANIEL W. HUNT.

Witnesses:

GEO. GUTHRIE,
GEO. J. SERRELL.