

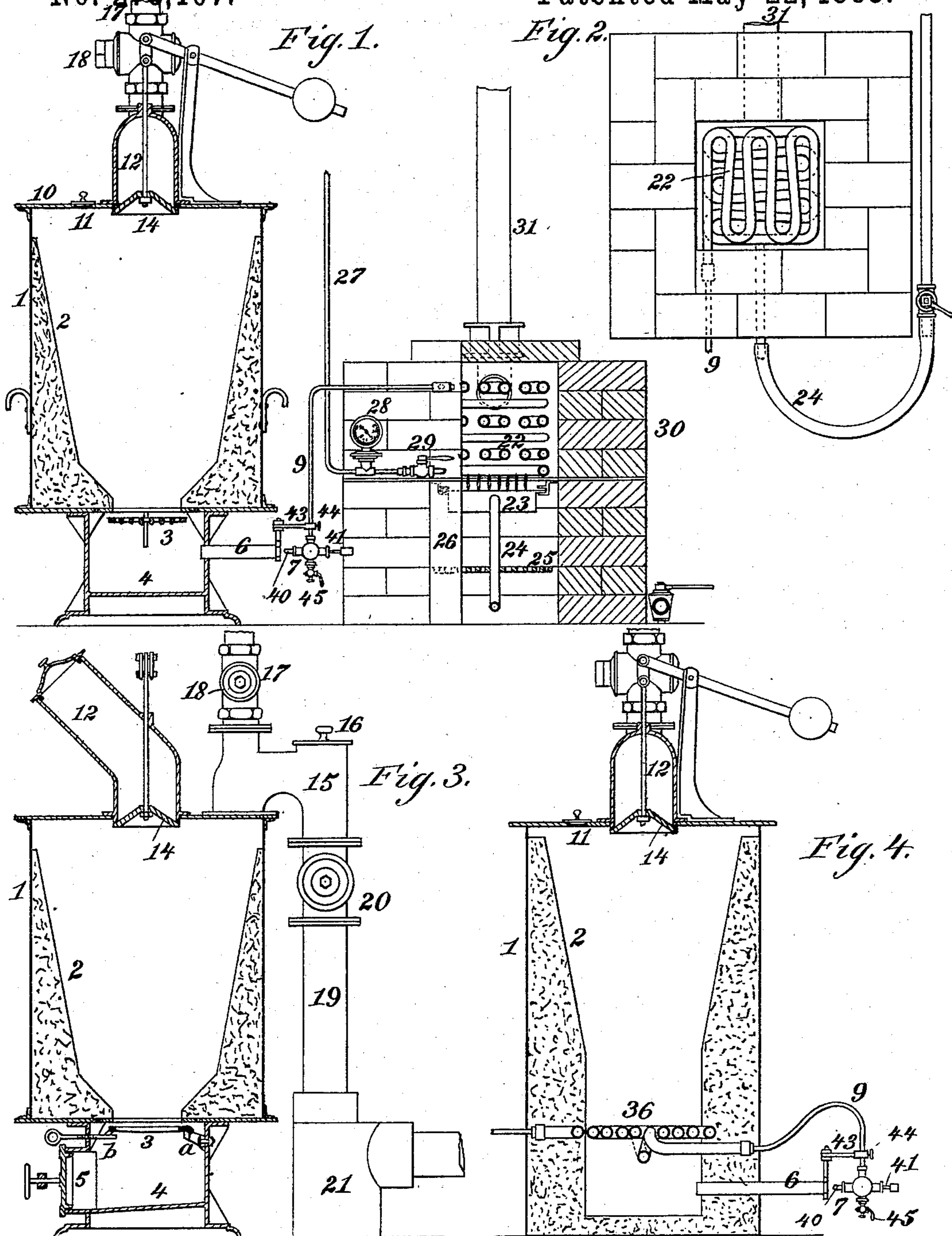
(No Model.)

J. E. DOWSON.

APPARATUS FOR THE MANUFACTURE OF GAS.

No. 278,107.

Patented May 22, 1883.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR THE MANUFACTURE OF GAS.

SPECIFICATION forming part of Letters Patent No. 278,107, dated May 22, 1883.

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*To all whom it may concern:*

Be it known that I, JOSEPH EMERSON DOWSON, of Westminster, London, England, have invented certain new and useful Improvements in Apparatus for the Manufacture and Treatment of Gas, of which the following is a full, clear, and exact description.

This invention relates to improvements in the manufacture and treatment of non-luminous heating-gas made by passing steam and air, or steam only, through incandescent carbonaceous fuel, and the improvements chiefly refer to apparatus for making such gas; but some of them may be used for other purposes also.

The accompanying drawings are intended to illustrate practical modes of carrying the invention into effect; but the precise forms and details of construction may be varied without departing from the general nature of the invention.

Figure 1 is a part elevation and part sectional view of a gas-generator and steam-superheater, and Fig. 2 is a plan view of the superheater. Fig. 3 is another part elevation and part sectional view of the gas-generator shown in Fig. 1. Fig. 4 is a vertical section of a gas-generator with a grate formed of hollow tubes.

The gas-generator shown in Figs. 1 and 3 consists of a metal casing, 1, cylindrical or otherwise, with a lining, 2, of ganister or other refractory material, a circular swing-grate, 3, with broad hinge and holding-up pin, a closed ash-box, 4, provided with a suitable door, 5, an air-induction pipe, 6, a steam-injector, 7, steam-pipe 9, leading to injector 7, a top or cover, 10, provided with a stoke-hole and cap, 11, a feeding-tube, 12, with loose faced lid, a valve, 14, with weighted lever to regulate the admission of fuel, a gas-outlet, 15, with cleaning-door 16, a chimney or waste pipe, 17, with suitable valve or cock, 18, a down-pipe, 19, with suitable valve or cock, 20, and a siphon or cleaning-box, 21, with outlet leading to gas-holder.

The steam producer or superheater shown in Figs. 1 and 2 consists of a zigzag coil of pipe, 22, a gas-burner, 23, a pipe, 24, to convey gas from the gas-holder to the burner 23,

a grate, 25, to receive a fire when there is no gas available for heating the coil, a door, 26, a pipe, 27, to convey water or steam into the coil 22, a pressure-gage, 28, a steam-cock, 29, a casing, 30, of brick-work or other suitable material, made solid, as shown on drawings, or made hollow, if preferred, to receive water to be heated before passing into the coil, a chimney-pipe, 31. The tubular boiler or superheater is used for producing steam to be decomposed in the gas generator or retort.

The gas-generator shown in Fig. 4 is similar to the generator shown in Figs. 1 and 3, except that it is provided with a hollow tubular grate, 36, in which steam is produced by the heat derived from the fire resting on the tubes. The top or cover and the fittings attached to it are similar to those shown in Figs. 1 and 3, or may be of any other convenient form. It will be seen that in this case the tubular grate takes the place of and dispenses with the separate steam producer and superheater shown in Figs. 1 and 2. The grate 36 can be made of hollow bars attached to a cross-tube at each end, and in a variety of other ways.

In some cases it may be desirable to produce the steam in a separate apparatus, and then ordinary fire-bars or any other suitable kind of grate may be substituted for the tubular grate 36. The grate may be made in halves, each half being supported by two spindles resting on bearings and held up on the opposite sides by pins.

The injector 7 consists of a hollow sphere provided with a nozzle, 40, for the outlet of steam, and a pin, 41, passing through a stuffing-box for the purpose of clearing the nozzle of obstructions. It has also a blow-off cock, 45. The nozzle is set opposite the air-induction pipe 6, and is held in position by a vertical support attached to the end of the pipe 6, this support carrying a horizontal piece, 43, which has a hole at one end, and an eye with a set-screw, 44, at the other. The eye is slipped over the steam-pipe 9, and is held firmly by the set-screw. The piece 43 is passed over the upper end of the vertical support, and is secured by a nut. The end of the pipe 6 may be provided with a movable cap, nozzle, or other

suitable contrivance for regulating the quantity of air to be admitted or to exclude air altogether.

In some cases it is desirable to use two injectors and two air-pipes. One injector would then be placed over the other, and in order that, when required, the lower one shall not pass steam and the air-pipe opposite to it shall not allow any escape outward from the generator, this air-pipe may be furnished with a movable disk which can be placed over the end of the pipe between it and the nozzle of the injector. A loose nut or covering-piece of tube which has been previously screwed onto the nozzle can then be unscrewed until it binds against the before-mentioned disk and causes the latter to be firmly fixed.

The gases resulting from the decomposition of steam passed through incandescent carbonaceous fuel, with or without air, have very little smell when the sulphureted hydrogen has been removed in the purifier; and when such gases are used, and it is desirable to detect any escapes or leaks, I pass such gases, having little or no smell, through one or more layers of naphthaline sublimed or otherwise suitably prepared, in order to give such gases an additional smell, and for this purpose I expose naphthaline in or on perforated trays or cells in a gas-tight vessel, and allow the gas to pass over until it is sufficiently impregnated with naphthaline.

Having thus fully described my invention, I

claim as new and desire to secure by Letters Patent—

1. In a gas-generator, the combination, with a casing, 1 2, provided with a grate in its bottom, and a feed-tube having a weighted valve, and a chimney with a valve in its top, of gas-outlet 15, provided with the cleaning-door 16, the down-pipe 19, provided with the valve 20, and the cleaning-box 21, substantially as herein shown and described.

2. In a gas-generator, the combination, with the casing 1, provided with the air-induction pipe 6, of the injector 7, the steam-pipe 9, the support 43, and set-screw 44, substantially as herein shown and described.

3. In a gas-generator, the combination, with the casing 1 2, provided with the induction-pipe 6, and the injector 7, of the tubular grate 36 and the steam-pipe 9, leading from the grate to the injector, substantially as herein shown and described.

The above specification of my new and improved apparatus for the manufacture and treatment of gas signed by me this 9th day of November, 1882.

JOSEPH EMERSON DOWSON.

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