(No Model.) 2 Sheets—Sheet 1.

# T. & S. ALEXANDER & R. PATERSON

## APPARATUS FOR MAKING OIL GAS.

No. 419,098. Patented Jan. 7, 1890.

FIG. 2.

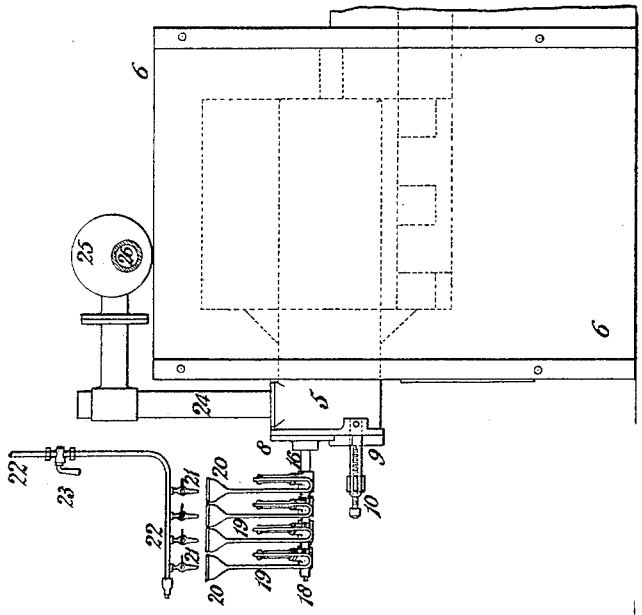
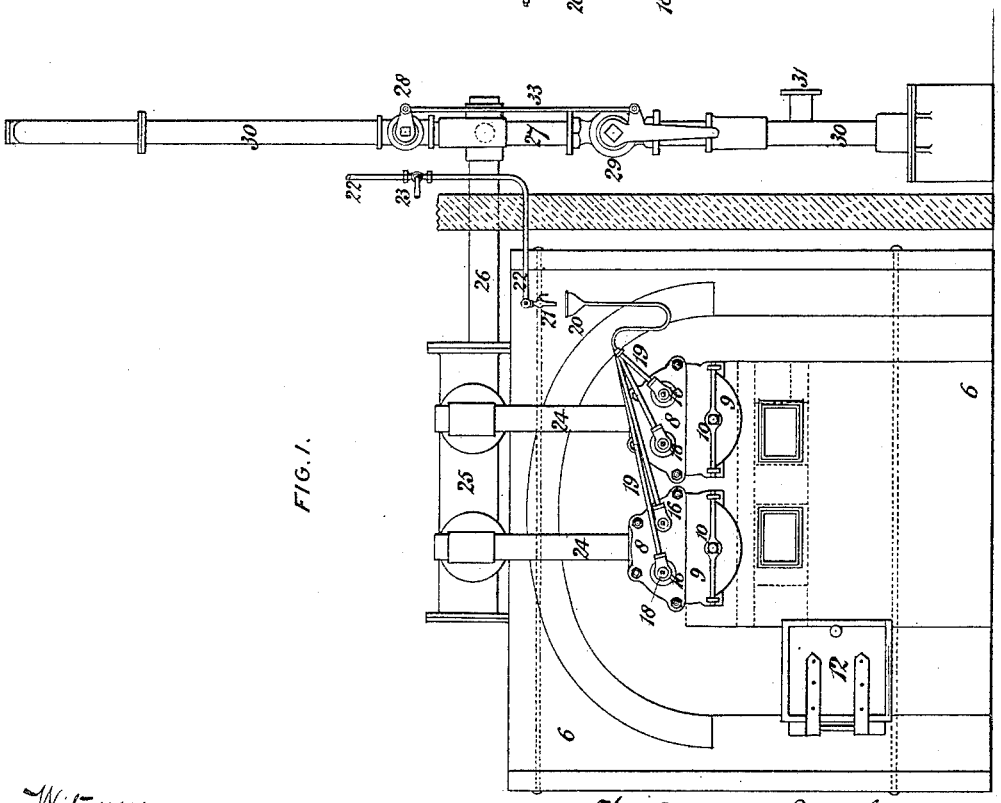



FIG. 1.




Witnesses.
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Geo. W. Kline

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(No Model.) 2 Sheets—Sheet 2.

# T. & S. ALEXANDER & R. PATERSON.

## APPARATUS FOR MAKING OIL GAS.

No. 419,098. Patented Jan. 7, 1890.

FIG. 4.

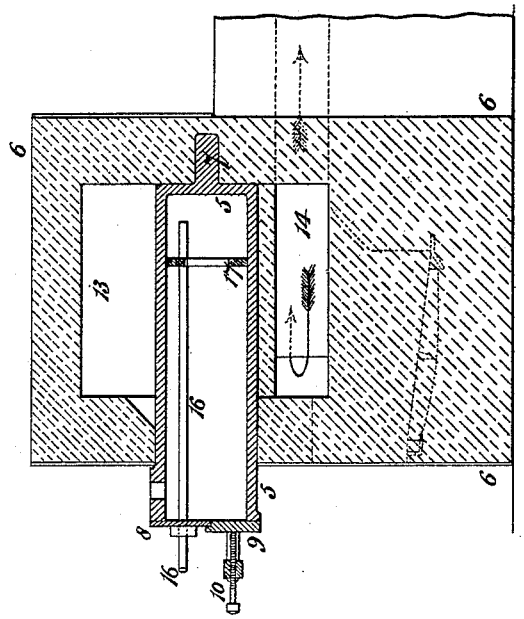
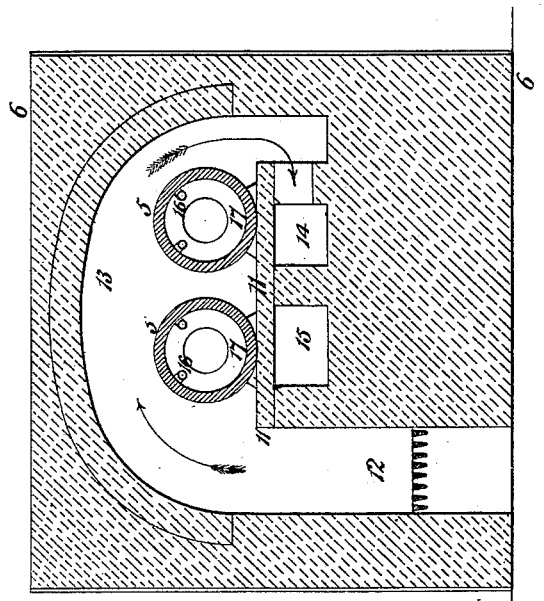



FIG. 3.

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# UNITED STATES PATENT OFFICE.

THOMAS ALEXANDER AND SAMUEL ALEXANDER, OF KIRKINTILLOCH, COUNTY OF DUMBARTON, AND ROBERT PATERSON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

## APPARATUS FOR MAKING OIL-GAS.

SPECIFICATION forming part of Letters Patent No. 419,098, dated January 7, 1890.

Application filed June 21, 1888. Serial No. 277,710. (No model.) Patented in England March 14, 1885, No. 3,323.

*To all whom it may concern:*

Be it known that we, THOMAS ALEXANDER and SAMUEL ALEXANDER, residents of Kirkintilloch, county of Dumbarton, Scotland, and ROBERT PATERSON, a resident of Glasgow, county of Lanark, Scotland, all subjects of the Queen of Great Britain and Ireland, have invented Improved Apparatus for Making Oil-Gas, (for which we have obtained British Letters Patent, dated March 14, 1885, No. 3,323,) of which the following is a specification.

Our invention has for its object, by improved, simple, and easily-managed apparatus, to make gas of good quality from oil.

Our improved apparatus is specially designed for use at country houses or in connection with works or other buildings where gas is made on the premises.

In carrying out our invention we employ one or more horizontal retorts of a cylindrical form arranged in a building with a fire-grate and flues suitable for heating the retorts with ordinary fuel. The oil to be converted into gas, and which is by preference purified petroleum or mineral oil, is led into each retort by two or more straight horizontal pipes placed near the inner surface of the retort, by preference at the upper part, and extending from the front end of the retort nearly to the back end, the inner ends of the pipes being open. The oil is partly converted in passing along the horizontal pipes and issuing from their inner ends. The vapor or gas is further acted on by the heat in passing from the back to the front end of the retort, at which latter part the outlet is situated.

Minor improved details, upon which the practical success of the apparatus largely depends, are hereinafter described.

In the accompanying drawings, Figures 1 and 2, Sheet 1, are front and side elevations; and Figs. 3 and 4, Sheet 2, are vertical sections as at right angles to each other.

In our improved apparatus two cylindrical iron retorts 5 are placed in a brick building 6, the back ends of the retorts being formed with studs 7, by which they are supported in the back wall of the building. The front ends of the retorts project through the front wall of the building 6, and each retort is fitted with two end covers 8 9, each upper cover 8 being bolted to the retort in a comparatively permanent manner, while each lower half 9 is held in place by a common bridle and screw 10, so that it can be easily opened for cleaning out the retort. Within the building 6 the retorts 5 rest on a horizontal fire-clay slab 11, and the fire-place 12 is made at one side and communicates with an upper oven-space 13, in which the retorts are situated. The fire-gases pass over the retorts 5 and have free access to their sides, and then pass downward at the side farther from the fire-place 12 and enter through ports into a flue 14, extending under one of the retorts. From the front end of the flue 14 the fire-gases enter a flue 15 under the other retort and proceed along it to a chimney at the back, (but not shown.)

Through the top front cover 8 of each retort 5 two pipes 16 are fixed so as to extend along inside the retort, near its upper internal surface, to within a short distance of the inner end of the retort. These pipes 16 have their inner ends open, and are supported near their inner ends by a ring 17, placed inside of the retort, and which ring divides the retort into oil or gas chambers. The pipes 16 are made quite straight to facilitate the cleaning of them, and each is fitted with a screw-plug 18 at its front end, which can be withdrawn to admit a cleaning-instrument. The oil is led into each pipe 16 at one side, near its outer end, by a pipe 19, made with a siphon-bend and provided with a funnel 20 at its outer end. Each retort-pipe 16 is separately supplied with oil, the several funnels 20 being for convenience arranged in a horizontal row beneath separate stop-cocks 21 upon a main supply-pipe 22, fitted with a main stop-cock 23 and connected with an oil-tank, (which is not shown, but which should be placed at a level a little higher than the stop-cocks 21.) The total supply of oil can be regulated by the main stop-cock 23, while the portion of the supply alloted to each retort-pipe 16 can be separately regulated by the branch stop-cocks 21. The gas formed in the retorts 5 passes off by ascension-pipes 24, connected to

their front ends at the tops, into a main 25, and thence by a pipe 26 into a vertical pipe 27, which is provided with two stop-cocks 28 29, one above and the other below the junction of the pipe 26. The upper stop-cock 28, when open, communicates directly with the atmosphere, and the lower one 29 communicates with an ordinary assemblage of pipes 30, known as an "air-condenser," (the set of these pipes 30 being supposed to be seen in edge view in Fig. 1 and to be extending backward.) A branch pipe 31 (shown in Fig. 1) is at the back end of the condenser, and is for the attachment of a pipe leading to a gas-holder of any convenient kind. The lever-handles of the two stop-cocks 28 29 are connected by a rod 33 in such way that the action opening one closes the other. When freshly starting to make gas, the upper stop-cock 28 may be opened to allow the gas or vapor first formed, and which is mixed with air, to escape to the atmosphere, instead of mixing with any good gas there may be in the condenser and gas-holder. The gas-holder drum is counterbalanced by weights made sufficiently heavy to raise it and produce a partial vacuum inside of it for the purpose of drawing the gas from the retorts and through the condenser and piping. This arrangement makes it necessary to provide the two connected stop-cocks 28 29, hereinbefore described, and the closing of the lower one 29 when the upper one 28 is open prevents air from being drawn in by the action of the partial vacuum.

Our improved apparatus, as hereinbefore described, is such as to allow of the action being easily and satisfactorily regulated and controlled, without which good gas cannot be formed economically and the apparatus cannot be kept in good order. With a suitable regular heat in the oven or flue space 13, it is essential for good working that neither more nor less than the proper supply of oil should be maintained. By opening the stop-cock 28 and allowing gas to issue from it its color will afford a means of judging whether the action is going on properly, and the attendant can adjust the supplies of oil or the heat from the furnace accordingly.

What we claim as our invention is—

1. The combination, with a furnace having a fire-space located to one side thereof and retorts in said furnace located wholly to one side of the fire-space, of flues beneath the retorts communicating with each other and the retort-chamber, whereby a single continuous circuit for heat and products of combustion is produced and all parts of the retorts heated, substantially as set forth.

2. A retort provided with an interior ring-plate having a central opening dividing the retort into communicating oil and gas chambers, an oil-pipe leading through both chambers and in open communication with the oil-chamber independent of the central opening of the ring-plate, and a gas-outlet pipe leading from the gas-chamber, substantially as set forth.

3. The combination, with a furnace-chamber, of a retort located therein, a ring-plate having a central opening located within said retort and dividing the latter into communicating oil and gas chambers, a straight pipe leading into the oil-chamber independent of the central opening in the ring-plate, a screw-plug closing the outer end of said straight pipe, and a siphon oil-supply connected to said straight pipe, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS ALEXANDER.
SAMUEL ALEXANDER.
ROBERT PATERSON.

Witnesses:
EDMUND HUNT,
JAMES DONALD.