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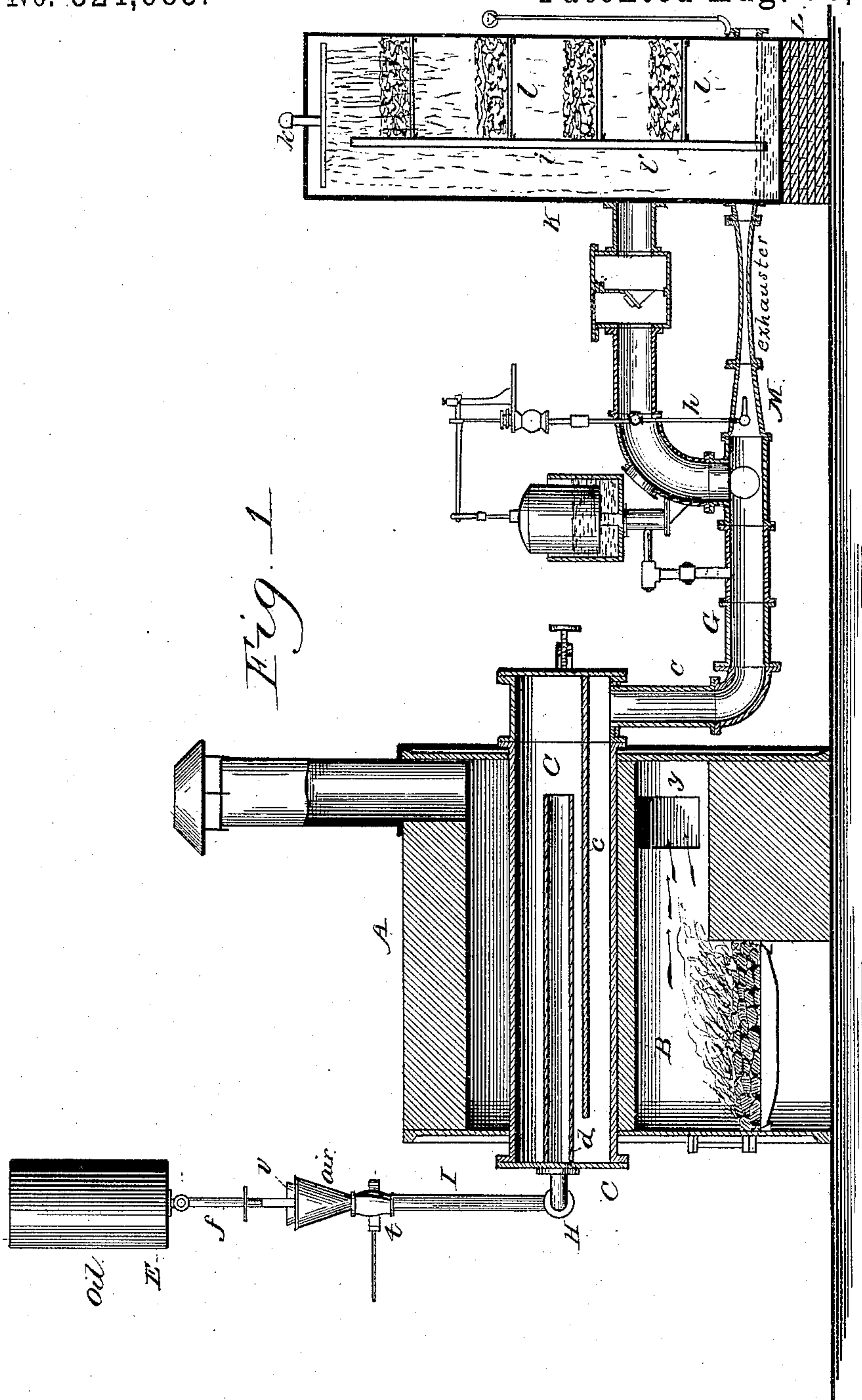
3 Sheets—Sheet 1.

J. HANLON.

APPARATUS FOR GENERATING HYDROCARBON GAS.

No. 324,685.

Patented Aug. 18, 1885.



WITNESSES:

*J. M. Reynolds*  
*J. J. White*

INVENTOR.

*John Hanlon*

BY

*O. E. Duff*

ATTORNEY





(No Model.)

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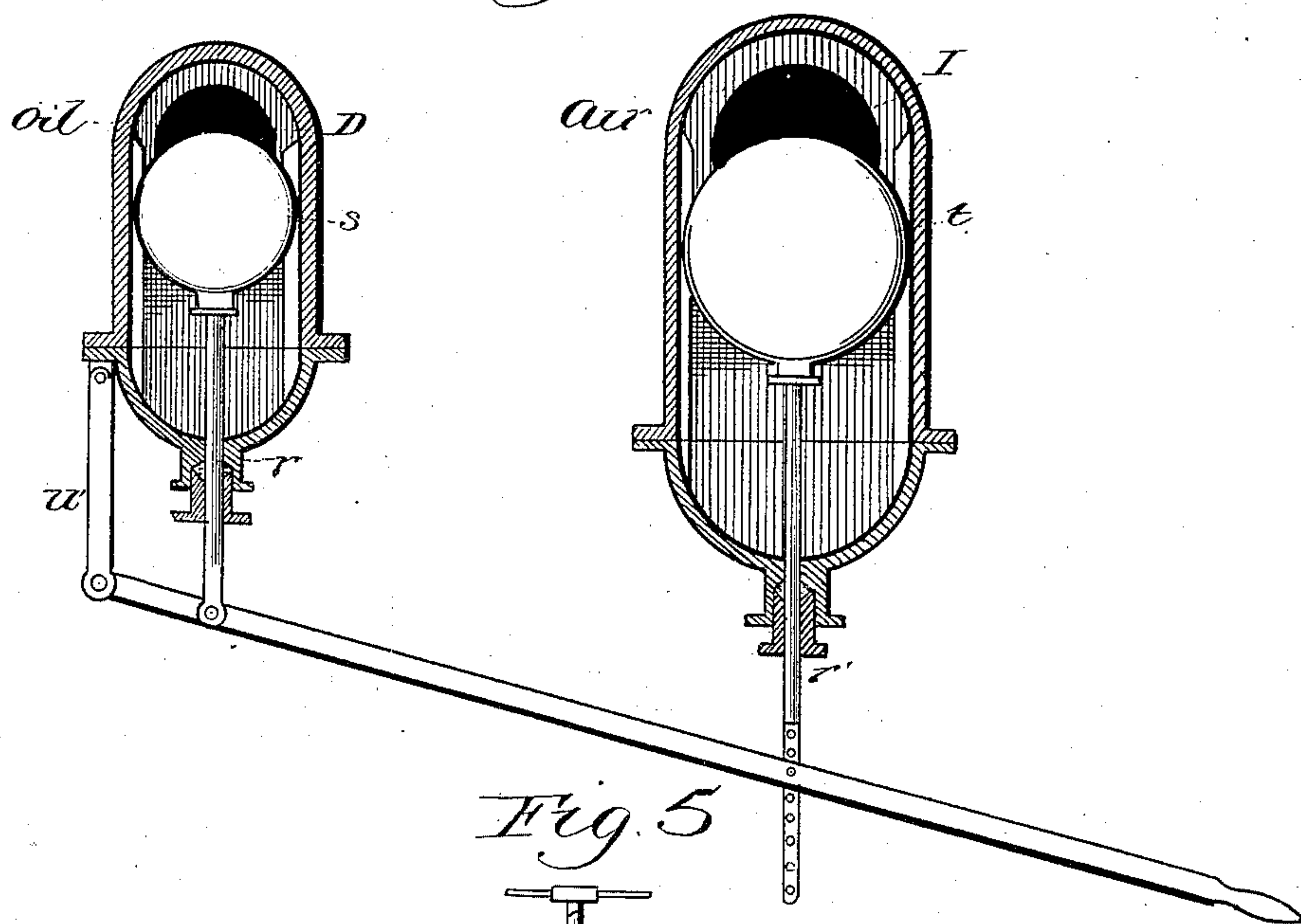
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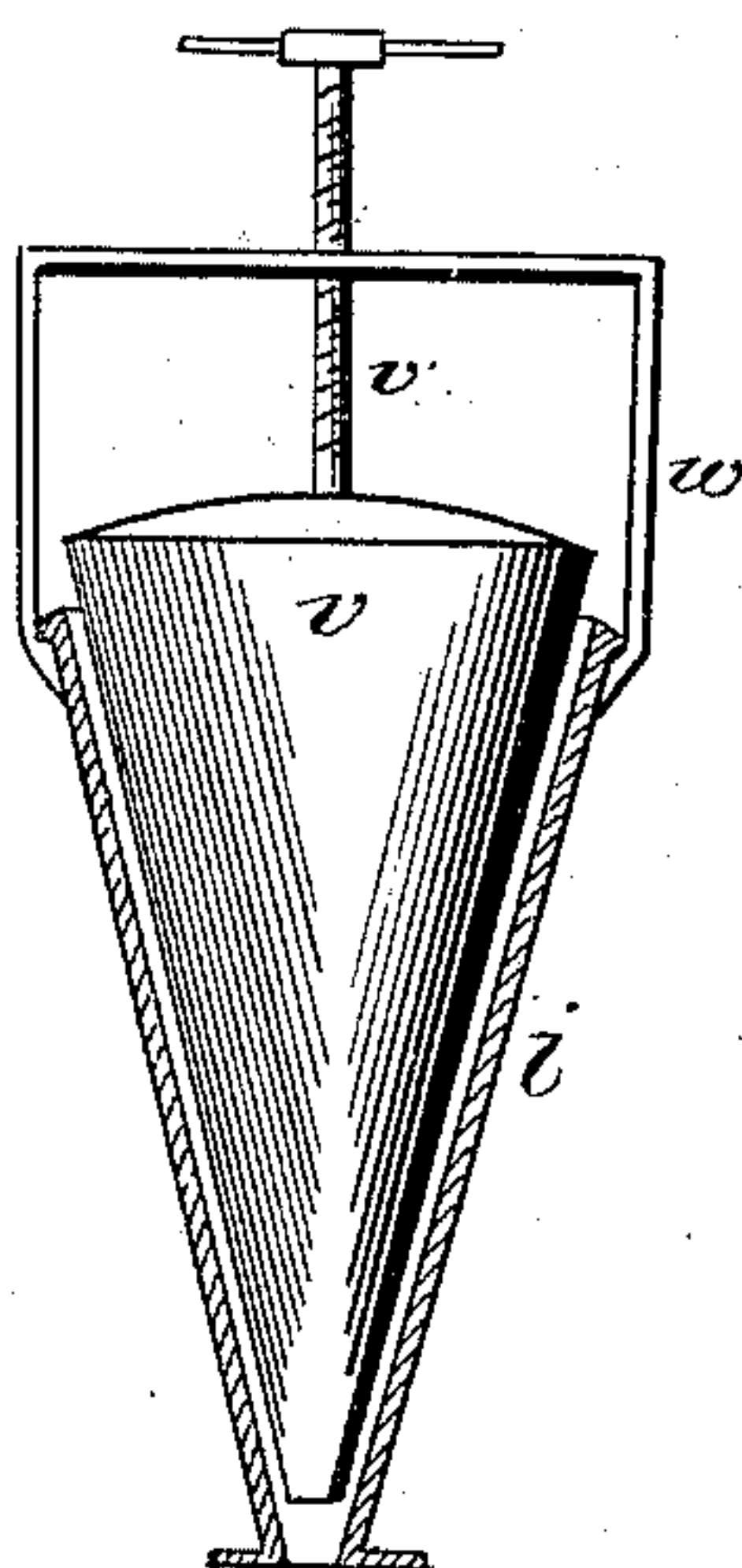
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*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

JOHN HANLON, OF NEW YORK, N. Y.

## APPARATUS FOR GENERATING HYDROCARBON GAS.

SPECIFICATION forming part of Letters Patent No. 324,685, dated August 18, 1885.

Application filed December 31, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HANLON, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Generating Hydrocarbon Gas; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to apparatus for manufacturing illuminating-gas from hydrocarbon or other oil in conjunction with a suitable quantity of air, the oil and air being subjected to heat together in the generating-retort, whereby the oil-vapors are intimately and uniformly mixed with the air and a fixed gas formed.

The object of the invention is to provide a simple and economical apparatus for generating gas on a comparatively small scale, and which is particularly adapted to supply gas to hotels, factories, or small towns.

The principal features of the invention are the means for accurately supplying the oil and air in proper quantities and in suitably-regulated proportions to each other to the generating retort or retorts.

The invention includes other features and combinations of parts, hereinafter described, and particularly pointed out in the claims.

My invention is illustrated by the accompanying drawings, in which Figure 1 represents a vertical longitudinal section of the apparatus with some of the parts in elevation. Fig. 2 represents a front elevation. Fig. 3 represents a vertical cross-section of the retort and furnace. Fig. 4 represents a horizontal section of the oil and air regulating valves on an enlarged scale; and Fig. 5 represents on an enlarged scale a sectional view of a controlling-valve used in air-pipe.

The retort-furnace A is built in most respects in the ordinary way, with a fire-chamber, grate, ash-pit, retort-oven, and a chimney, and has the usual fuel and ash doors. A fire-clay tile, B, separates the fuel-chamber from the retort-oven, and flues or ports *y*, for products of combustion, connect the rear end of

the fire-chamber on each side with the oven above, below the division plates or flanges *b*, extending from each side of the retort and resting on lugs or ledges *a*, extending from the side walls of the furnace. The flanges *b* and ledges *a* form a horizontal partition dividing the oven into two chambers, and are provided with openings on each side of the retort near the front end of the furnace, so that the flame and hot products of combustion after passing back under the retort are compelled to pass forward and backward on each side of the retort, and thereby uniformly and highly heat it.

The retort C rests upon the protecting-tile B, and projects at both ends through the furnace walls, the ends being closed by removable caps or lids, and it is provided with a horizontal partition-plate, *c*, extending from the rear to near the front end. It is also provided with a vaporizing-tube, *d*, passing through the front lid and extending above plate *c* to near the rear end. The oil and air inlet pipe H connects with the front end of tube *d*, and the oil-supply pipes N D and the air-supply pipe I connect with pipe H. Pipe D connects directly with pipe F, leading from oil-tank E, while pipe N, bent to form a trap, is provided with a funnel, *e*, and valve *e'*, at its upper end, and receives oil from drip-pipe *f*, having valve *n* and connecting with pipe F.

The pipes D and I are provided at the same height with gate-valves *s* and *t*, the stems *r r'* of which are pivoted to lever *u*, and this lever is pivoted to the swinging link *u'*, which is pivoted to the valve-casing on the oil-pipe. (See Fig. 4.) The valve-stems *r r'* pass through packing-boxes in the casings, and ground-seats are provided in the casings for making tight joints when the valves are closed. The outer end of stem *r'* is provided longitudinally with a number of perforations, whereby it may be coupled at any desired point to the lever *u*. The location of air-valve *t* with relation to oil-valve *s* may thereby be varied at will, so that it may be opened more or less when the oil-valve *s* is opened a certain distance, and the proportion of the air to the oil admitted thus increased or diminished, according to the richness of gas and quality of flame required.

The valves being properly adjusted to admit oil and air in suitable proportions to make the quality of gas desired, they are operated.



simultaneously by lever *u*, so as to regulate the feed of both oil and air and admit such quantity of the combined fluid as the heat on the retort will convert into a fixed gas. The upper end of air-pipe *I* is provided with a funnel-shaped mouth, *i*, forming a valve-seat for the conical controlling-valve *v*, which is adjusted to or from its seat by the screw-threaded stem *v'*, passing through yoke *w*.

The gas-take-off pipe *G* connects at the lower side with the rear end of the retort, and connects with an exhaustor, *M*, which opens into the base of scrubber and washer *K*. The exhaustor is provided with a steam-jet pipe, *h*, and is of the ordinary kind found in the market, and therefore needs no further description. Any well-known steam-jet exhaustor may be used.

The scrubber is provided with a vertical partition, *l'*, and with grates *l*, for supporting coke or other porous material, and has at the top a spray-head, *k*, for showering water over the porous material. The exit-pipe *L* leads from the base of the scrubber.

The pipe *N* is for supplying the initial charge of oil to the retort before the regular gas-making operation is commenced. The object of such initial charge of oil is to fill the joints and seams of the retort and connecting-pipes with carbon for preventing subsequent leakage of gas. Pipe *N* may also be used for admitting an additional quantity of oil while making gas, when the valves *s* and *t* are adjusted to admit certain proportions of oil and air, and when it is desired to increase the candle-power of the gas.

The exhaustor serves the usual purpose of exhausting the gas from the retort so as to relieve it of undue pressure, and also to draw air in with the oil, whereby it may be heated and intimately mingled with the oil, vapor, and gas.

In starting a new apparatus the retort is heated to or above a cherry red. Then the oil alone is at first admitted through pipe *N* till the joints and seams of the retort and pipes are tightly sealed with carbonaceous deposits, when the supply through pipe *N* is shut off, and the valves *s* and *t* are adjusted in the proper relation to each other and sufficiently opened to admit the requisite quantity of oil and air. The oil is vaporized in tube *d*, the air is expanded therein and mingled with the oil-vapor, and the mixture is converted into a fixed gas by passage through the upper and lower compartments of the retort. During the generation of gas the steam-jet exhaustor is kept in

operation, producing a partial vacuum in the retort and forcing the gas into the scrubber, where it is washed and purified of any condensable matter it may contain. The air flowing into the retort serves to prevent any formation and deposit of lamp-black and to dilute the rich oil-gas to the proper standard for illuminating purposes.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The retort having a horizontal division-plate extending from the rear end to near the front end, and the vaporizing-tube extending from the front end to near the rear end above the division-plate, in combination with the oil and air inlet pipe connecting with said tube, and the gas-take-off pipe connecting with the rear end of the retort below the division-plate, for the purpose described.

2. In combination with the generating-retort, the pipe *H*, oil-pipe *N*, having a trap and funnel, oil-pipe *D*, connecting with the supply-tank, and air-supply pipe *I*, for the purpose described.

3. In combination with the generating-retort, the oil and air inlet pipes provided with valves, the gas-take-off pipe, and a connected exhaustor, for the purpose described.

4. In combination with the generating-retort, the oil and air inlet-pipes provided with valves pivotally connected to a single operating-lever, whereby the supply of oil and air may be simultaneously increased or diminished and the proper proportions thereof maintained.

5. In combination with the generating-retort, the oil and air supply pipes, the valves thereof pivotally connected to a single operating-lever, and means for varying the connection of the air-valve stem with such lever, whereby the air-valve may be connected to open more or less in proportion to the oil-valve and the relative proportion of oil and air supplied to the retort changed as desired.

6. The combination of the generating-retort, the oil and air supply pipes provided with valves pivotally connected to a single operating-lever, the gas-take-off pipe, and a connected exhaustor, for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN HANLON.

Witnesses:

E. EVERETT ELLIS,  
O. E. DUFFY.