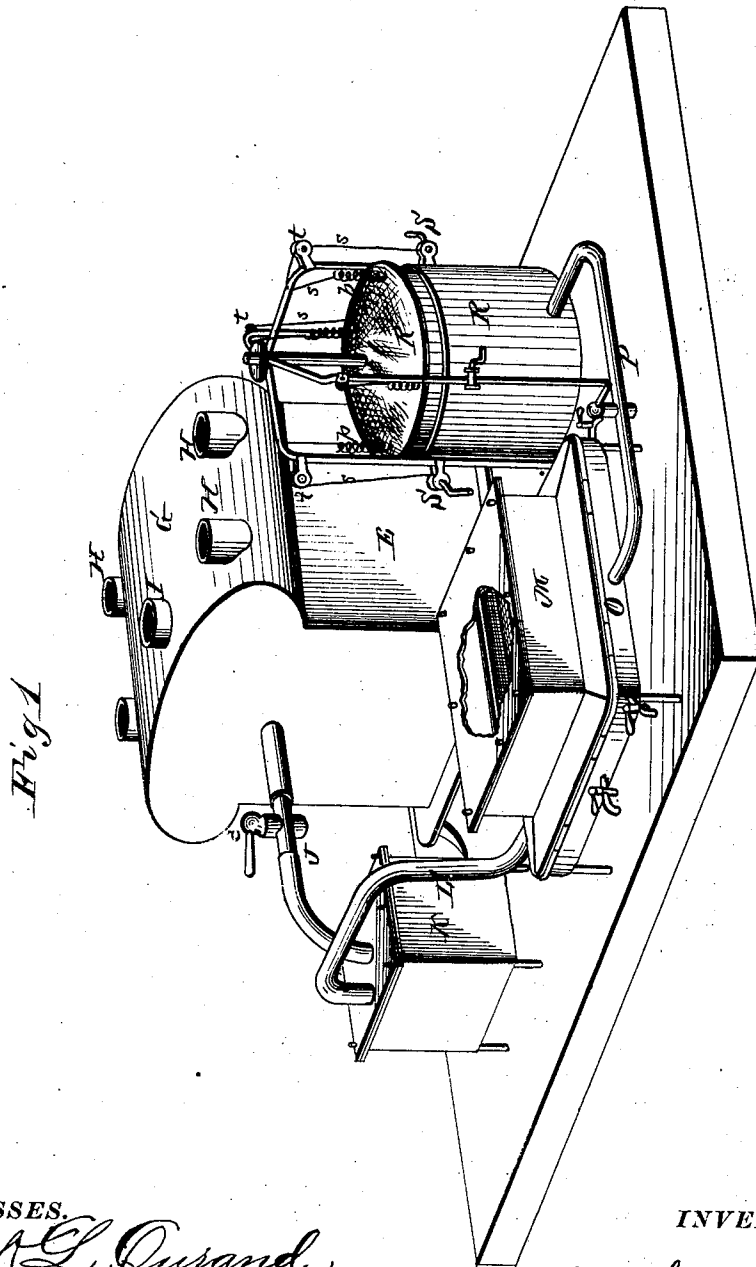


D. H. IRLAND.
Gas-Machines.

No. 155,310.

Patented Sept. 22, 1874.



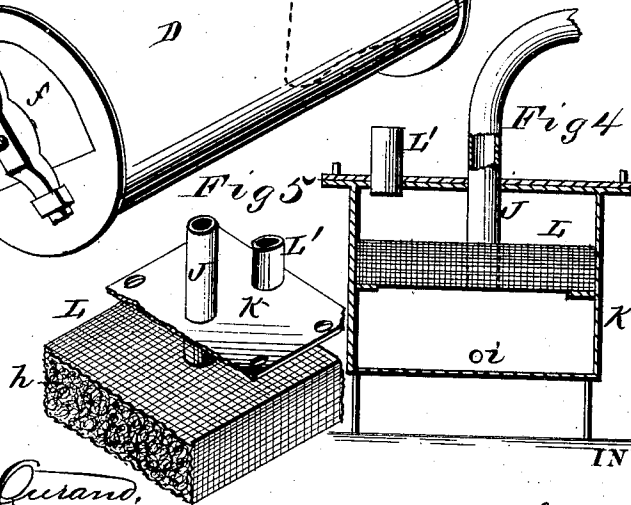
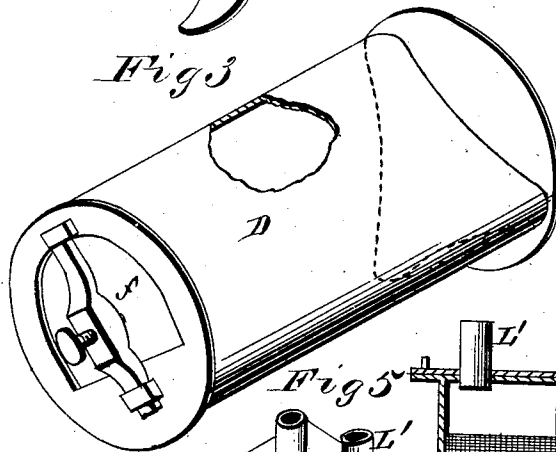
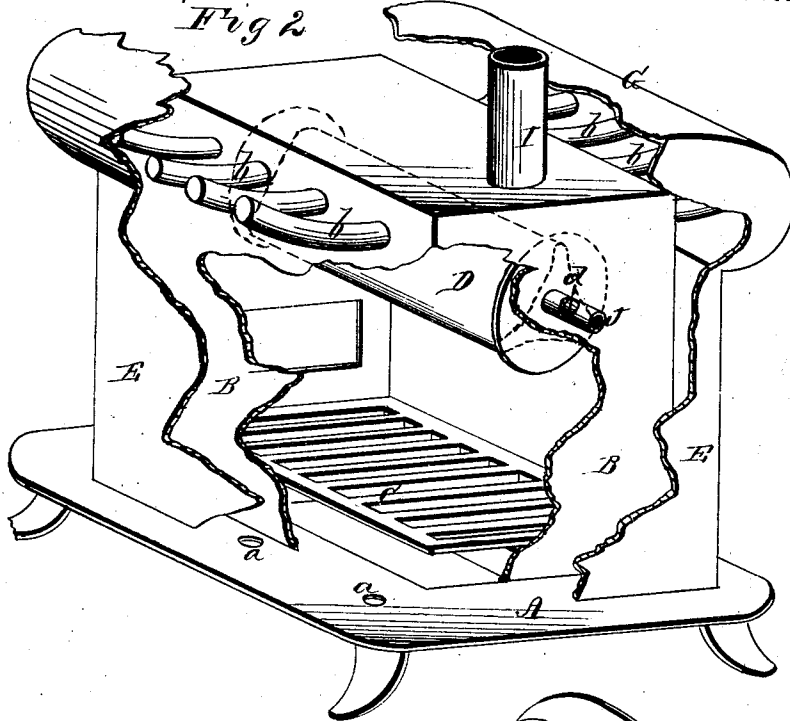
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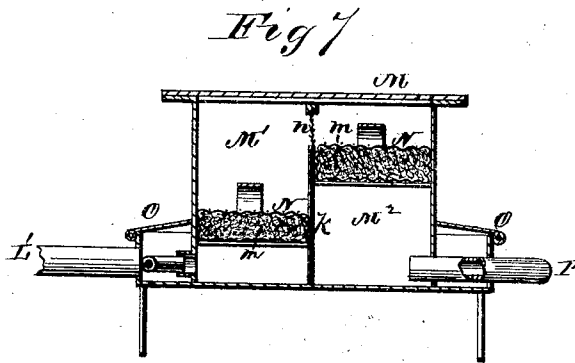
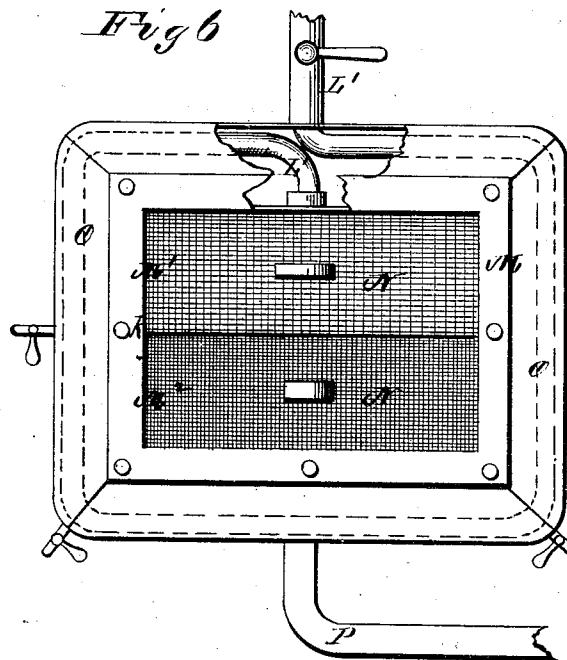
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UNITED STATES PATENT OFFICE.

DAVID H. IRLAND, OF NEW YORK, N. Y., ASSIGNOR TO A. LINCOLN BLAKE
AND JAMES W. GUERNSEY.

IMPROVEMENT IN GAS-MACHINES.

Specification forming part of Letters Patent No. **155,310**, dated September 22, 1874; application filed
June 5, 1874.

To all whom it may concern:

Be it known that I, DAVID H. IRLAND, of New York, in the county of New York and in the State of New York, have invented certain new and useful Improvements in Gas-Machine; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a gas-machine, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a perspective view of my machine. Fig. 2 is a perspective view of the furnace, the shells of the same being broken open to show the interior thereof. Fig. 3 is a perspective view of the retort. Fig. 4 is a longitudinal section of the condenser. Fig. 5 is a perspective view of the screen therein. Fig. 6 is a plan view of the purifier with the lid removed, and Fig. 7 is a transverse vertical section of the same.

A represents the base of my furnace, with fire-box B placed thereon. C is the grate in the bottom of the fire-box, with suitable ash-pit below. In the upper part of the fire-box is located the retort D. The whole fire-box is surrounded by an exterior shell or jacket, E, the upper part of which forms a dome, G. In the base A, between the fire-box B and exterior shell E, are apertures *a a*, for the admission of cold air from underneath, which air becomes heated by contact with the heated surface of the fire-box, and passes out through pipes H H in the top of the dome G. The heated air may be carried through suitable pipes to various apartments and be distributed by registers in the usual manner.

To increase the heating-surface over which the air passes, the upper part of the fire-box is, on each side, provided with curved pipes *b b*, the outer ends of which extend to the sides of the dome, and are closed, their inner

ends opening into the fire-box, so that the heat and smoke may circulate in said pipes. I is the smoke-pipe from the fire-box. The retort D is made triangular in its cross-section, and provided at its rear end with a central tube, *d*, which is inserted in a tube, J, extending from the rear of the fire-box through the shell. The tube *d* forms the rear journal, upon which the retort revolves, the front journal being formed by a shoulder on the circular head attached thereto. In the front end of the retort is a man-hole, closed by a suitable door, *f*.

The triangular form of the retort D allows of either side being used downward, so as to prevent its being burned out too rapidly, and the retort will last much longer. An ordinary retort will last only about one year, while by making it triangular, and shifting it as often as is necessary, it may be made to last fully three years. The retort need not necessarily be made to turn in its bearings, but only so that it can be taken out and shifting it either side down, making it a portable retort. The sides of the retort are made more or less concave on the outer side, whereby the heating-surface is increased without diminishing the capacity of the retort to any extent.

The gas from the retort passes through the pipe J into the condenser K, the flow of gas being regulated by a stop-cock, *e*, in the pipe. Within the condenser K is a double wire-cloth screen, L, filled with cotton *h*, as shown particularly in Fig. 5. The pipe J passes down through this screen, so that the gas will enter the condenser below the screen, and, rising, pass through the same and through a pipe, L', to the cooler and purifier. As the gas passes through the cotton *h* in the screen, all the heavy substances are absorbed by the cotton and afterward drop down into the bottom of the condenser, from which they may be drawn off through a stop-cock or faucet, *i*. M represents the purifier-box, divided by a partition, *k*, into two compartments, M¹ and M², each containing a wire-cloth screen, N, filled with cotton, *m*. In the compartment M¹ the screen is placed near the bottom, and the space above the screen filled or nearly filled with lime. In the compartment M² the screen is

placed near the top, and lime is placed below. In the upper part of the partition *k* is a screen, *n*, extending the entire length of the partition, as shown. The purifier-box M is placed in a pan, O, which extends up a suitable height, and the top of the pan around the sides of the purifier closed by hinged covers or other suitable means, as desired. The pipe L', from the top of the condenser, passes into the pan O on one side and around the purifier, and then enters the compartment M¹ below the screen therein. The pan O is to contain water, so as to cool the gas during its passage through the pipe; or a stream of water may be kept running through the pan, as may be required to properly cool the gas. The pan or cooler O is provided with suitable faucets at different height, to allow the water to stand therein at any desired height. The gas, entering through this pipe into the compartment M¹ below the screen, rises through said screen and cotton filling and the lime above it; then through the screen *n* in the partition *k*, into the compartment M², above the screen therein. The gas then passes down through this screen and its cotton filling and the lime below it, and out from the bottom of the compartment M² through a pipe, P, to the gasometer R. During its passage through the double purifier thus constructed, the gas is perfectly purified, so as to enter the gasometer as pure illuminating-gas. The gasometer R is constructed in the usual manner, and supported by or suspended from springs *p p*, each spring being attached to a cord or chain, *s*, which passes over a pulley, *t*, and is attached to a windlass, S, whereby the tension of the springs is readily regulated. The object of suspending the gasometer from springs is to relieve the pressure upon the retort, which is especially of advantage in portable gas-works while the gasometer com-

mences to fill. Afterward the gas itself will sustain the gasometer.

I am aware that a triangular retort having flat sides is not new.

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

1. The triangular retort D, having its sides made concave on the outside, substantially as herein set forth.

2. In combination with a condensing-chamber, K, provided with interior ledges, the removable wire box L, filled with cotton, and the pipe J, conducting the gas from the retort into the condenser, through and below the box L, all substantially as set forth.

3. The double purifier M¹ M², provided with double removable screens N N, filled with cotton, in combination with the screen *n* in the partition *k*, the purifier being filled with lime or its equivalent above one screen and below the other, so that the gas will pass in both compartments, first through the screens and then through the lime, all arranged substantially as and for the purposes herein set forth.

4. The combination of the double purifier M¹ M², the cooling-chamber O, entirely surrounding the bottom thereof, and the pipe L', passing entirely around within the same, all substantially as set forth.

5. The springs *p p* and wires or chains *s s*, in combination with the gasometer, for the purpose of relieving the pressure in the retort, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of June, 1874.

D. H. IRLAND.

Witnesses:

J. M. MASON,
W. T. JOHNSON.