W. S. HILL.

APPARATUS FOR MANUFACTURING ILLUMINATING GAS.

No. 193,407. Patented July 24, 1877.

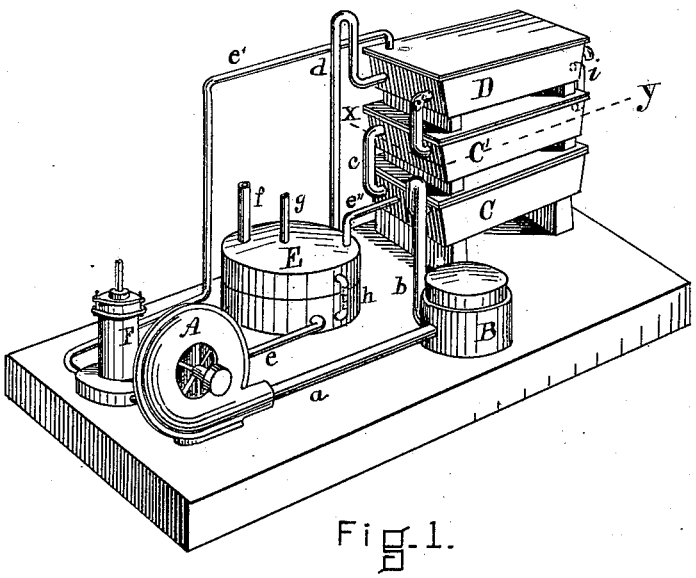

Fig. 1.

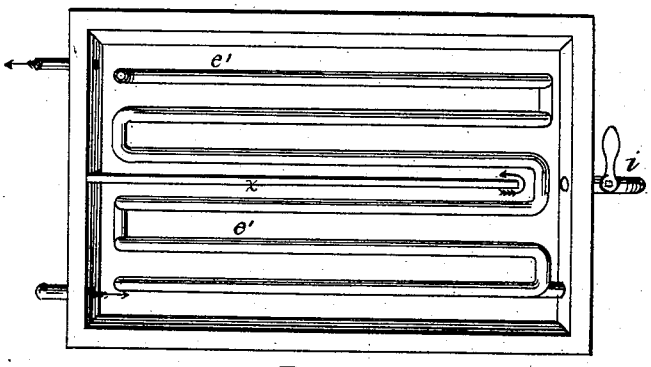

Fig. 2.

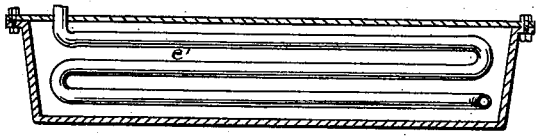

Fig. 3.

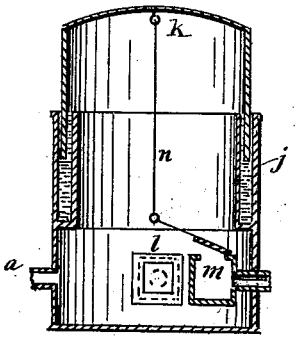

Fig. 4.

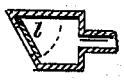

Fig. 5.

WITNESSES

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IMPROVEMENT IN APPARATUS FOR MANUFACTURING ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **193,407**, dated July 24, 1877; application filed March 9, 1877.

To all whom it may concern:

Be it known that I, WARREN S. HILL, of Hyde Park, county of Norfolk, and State of Massachusetts, have invented a new and useful Improvement in Apparatus for the Manufacture of Illuminating-Gas from Gasoline, of which the following is a full and exact specification:

This invention relates to certain improvements in apparatus for the manufacture of illuminating-gas from gasoline or naphtha; and consists of certain combinations and appliance of devices not new in themselves, but which, by such combinations, are made to produce a new and useful result. It is designed more especially to be used in factories or other places where steam or other power is employed.

The first part of my invention consists of the employment of a rotary pressure-blower driven by steam or other power operating in combination with an automatic regulating-receiver, to produce and deliver to the carbureting-tanks a steady current of air at the required pressure.

The second part of my invention consists of the employment of a plunger or suction pump, connected by pipes with the reservoir containing the gasoline, and the carbureting-tanks, the reservoir being placed beneath the tanks, and so arranged that the gasoline will be carried by the action of the pump from the reservoir to the carbureting-tanks above, and that when the tanks are filled to the required level the overflow will be carried back to the reservoir again. Besides keeping the tanks constantly filled to the required level, the gasoline can by this arrangement be kept in constant circulation, and thus prevent the heavier particles of the gasoline from settling to the bottom and forming a residuum of so heavy grade that it will not give off its vapor sufficiently free to be taken up by the air in the quantity required to make good gas.

The third part of my invention consists of the employment of the pipe through which the gasoline is conveyed from the reservoir to the carbureting-tanks, in combination with a suitable vessel to form a condensing-chamber, through which the gas shall pass, for the purpose of removing by condensation any surplus of moisture it may contain.

The chamber may be of the same form as the carbureting-tanks, and contains a coil of pipe, through which the gasoline passes on its way to the carbureters. It may be placed over or near the carbureters, and connected therewith by suitable pipes, so that the gas from the carbureters is delivered into the chamber, and in contact with the pipes made cold by the circulating gasoline. A division nearly across the chamber causes the gas to traverse the entire surface of the condensing-chamber in its passage to the outlet-pipe. A cock is provided to draw off the condensed matter.

The arrangement and operation of my invention will be readily understood by reference to the drawing accompanying this specification.

Figure 1 is a perspective view, showing all the different parts in position. A is the blower, with the air-pipe *a* connecting it with the automatic receiver B. *b* is the air-pipe connecting the receiver with the carbureting-tank C, which is connected with carbureting-tank C′ by pipe *c*. Pipe *c′* connects carbureting-tank C′ with the condensing-chamber D, and pipe *d* connects the condensing-chamber D with the main. E is the reservoir containing the supply of gasoline. *e* is a pipe leading from the reservoir E to the pump F. *e′* is a pipe running from the pump F, through the condensing-chamber D, to the carbureting-tank C′. *e″* is a pipe connecting carbureting-tank C with the reservoir E. *f* is a pipe through which the reservoir may be filled, and *g* is a pipe to provide a vent while filling the reservoir.

Fig. 2 is a plan of the condensing-chamber with the cover removed. The pipes *e′* are a continuation of the pipe connecting the pump F and the carbureting-tanks. *x* is a partition extending nearly across the chamber D, causing the gas to flow round in the direction shown by the arrow. A draw-off cock is shown at *i*.

Fig. 3 is a section showing the course of the pipes *e′* in the condensing-chamber.

Fig. 4 shows a vertical section of the automatic receiver. The annular space *j* is filled

with water, and forms a packing for the movable dome *k*. *a* is the inlet-pipe. *l* is the outlet-valve, connecting with the pipe *b*. *m* is the escape-valve, connected by the chain *n* to the movable dome *k*.

Fig. 5 is a side view of the valve *l*, the valve opening as indicated by the dotted line.

The disposition of the parts considered most suitable for the perfect operation of my invention is to put the carbureting-tanks, reservoir, and the automatic receiver in a suitable apartment by themselves, at such distance from the building to be lighted as will secure safety from fire, and to put the blower and pump in the building to be lighted, or where it will be accessible to steam or other power by which it is to be driven, connection with the other parts being made by pipes running under the ground. The method which I have practiced, and which I prefer, is to provide a small engine to take its steam from the boilers already in use; or, if the factory is driven by water-power, a small water-wheel may be used, thus making the gas apparatus independent of the power used for other purposes.

The operation of my invention is thus described: A rapid motion being imparted to the blower by any suitable power, air is driven through the pipe *a* into the automatic receiver B, and thence through the valve *l* and pipe *b* to the carbureting-tanks C C′ and condensing-chamber D to the main. The pressure of the air in the receiver will cause the dome *k* to rise in the liquid packing until, by means of the chain *n*, the valve *m* is raised enough to allow the surplus of air not needed to keep up the supply of gas in the main to escape. The dome *k* may be weighted, so as to give any degree of compression to the air that may be required. The pressure in the receiver will be communicated, through the valve *l*, carbureters, mains, and pipes, to the burners, and if no gas is being consumed, the entire amount of air carried into the receiver will go to waste through the escape-valve *m*; but when any number of burners are lighted, just as much air will go to the carbureters as is needed to make good the amount of gas consumed, thus insuring at all times a steady and uniform supply of air at the required degree of compression.

The reservoir E being filled with gasoline, the pump F is put in motion, when the gasoline is carried through the pipes *e* and *e′* to the upper carbureting-tank C′, filling it to the level of the pipe *c*, as shown by dotted line *x y* in Fig. 1, when it flows through the pipe *c* into carbureting-tank C, filling this to a similar level, or to the pipe *e″*, through which it flows to the reservoir again. The pump may be kept in motion continuously, and thus, besides keeping the gasoline always at the required level in the carbureting-tanks, the gasoline will be kept in constant circulation, and any tendency of the gasoline to separate, by the heavier particles settling to the bottom, will be obviated.

The pipe, from the pump F to carbureting-tank C′, is made to traverse a number of times through the condensing-chamber D, in such a manner that the gas passing through the chamber shall be brought into contact with its outer surface, which, being made cold by the circulating gasoline within, will cause any surplus moisture that may be contained in the air to condense on the surface of the pipes, and be retained in the chamber, from whence it may be drawn at the cock *i*.

Any number of carbureting-tanks may be employed. Those shown in the drawing consist of square tanks having divisions running lengthwise, to cause the air to traverse a number of times across the tank in its passage from the inlet to the outlet pipe. Carbureters of any other approved style may be used. The condensing-chamber may also be of any other form, and used in different positions, without materially changing the result of its operation.

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

1. In an apparatus for the manufacture of illuminating-gas from gasoline, the rotary blower A, operating in combination with the automatic receiver B, pipe *a*, escape-valve *m*, and valve *l*, to produce and deliver to the carbureting-tanks C C′ a steady current of air at a uniform pressure, in the manner and for the purpose specified.

2. In an apparatus for the manufacture of illuminating-gas from gasoline, the chamber D, with partition *x*, and pipe *e* and *d*, operating in combination with the reservoir E, pump F, and coils of pipe *e′*, whereby gasoline is circulated through chamber D, for condensing the surplus moisture from the gas, in the manner and for the purpose specified.

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