J. F. BIRCHARD.

Carbureter.

No. 48,706. Patented July 11, 1865.

Fig. 2.

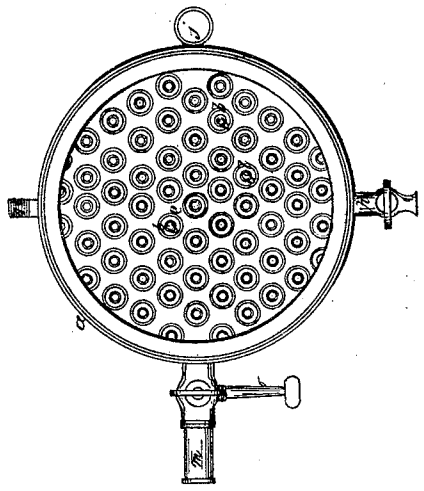
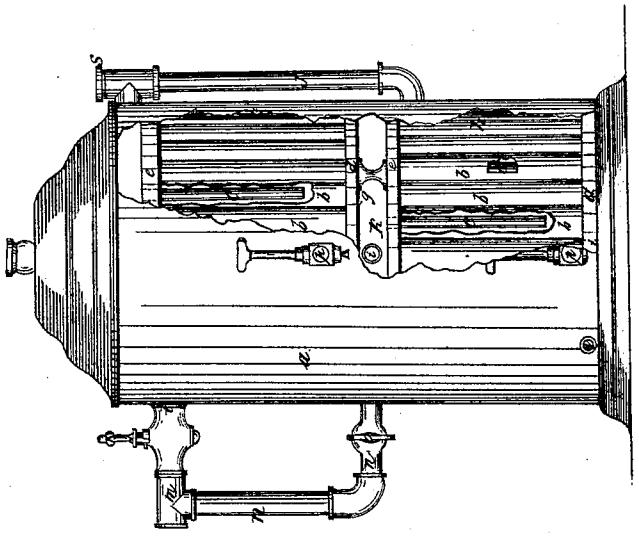


Fig. 1.



Witnesses:

J Smith

L. C. Jones

Inventor:

J. F. Birchard

by Atty Thos. F. Everett

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

# UNITED STATES PATENT OFFICE.

J. F. BIRCHARD, OF MILWAUKEE, WISCONSIN.

## IMPROVED APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **48,706**, dated July 11, 1865.

*To all whom it may concern:*

Be it known that I, J. F. BIRCHARD, of the city of Milwaukee, in the State of Wisconsin, have invented a certain new and useful Improvement on Hydrocarbon-Vapor Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, and to the letters and marks thereon.

The drawings forming part of this specification represent an apparatus constructed under my invention, Figure 1 thereof being a view by elevation with a part of the shell removed so as to show the interior pieces or parts of the apparatus, or so much thereof as will illustrate the structure within, and Fig. 2 being a top view of the same, with the cap or head removed, so as to show the series of tubes therein.

In both of these figures, where like parts are shown, like marks and figures are used to indicate the parts.

From the figures of these drawings it will be seen that the shell or body *a* of the apparatus has within it certain tubes *b* and *c*, the first of which, *b*, are made of cotton cloth or some other suitable fibrous fabric or material, connected to a lower head, *d*, and to an upper head, *e*, and the second, *c*, being made of metal, placed within the fibrous tubes and connected only to the upper head, *e*. All of these tubes are vertical. The metal tubes do not pass down to the lower head, *d*, but terminate a short distance above that head. The tubes *b* can be secured to the lower head by their edges being turned outward and tacked to the head, or they may pass through holes in this head and then be closed by plugs, which will bind the ends of tubes in the holes, cement being used or not, as may be necessary to form a tight joint. The upper ends of the tubes *b* will be properly secured in holes in the upper head, *e*, by collars or washers or by such suitable means, and will allow of the upper and open ends of the tubes *c* being also there properly held. In some instances these tubes *c* may be shorter than what are represented by the drawings, a hole or passage through the head and into the tubes *b* being all that is necessary in some cases.

In Fig. 1 two sets of tubes with heads are represented, the one set occupying the upper chamber, *f*, of the apparatus, the lower head, *d*, thereof resting upon the dividing-plate *g*, and the other set occupying the lower chamber, *h*, the lower head, *d*, resting upon the bottom plate, *i*, of the apparatus—the apparatus being shown as made up of two tight compartments communicating with each other by the tube *j*, a space, *k*, existing between the upper head of the lower set of tubes and the bottom plate, *g*. As is evident, one set of tubes only can be used, or the number of sets may be increased as may be required to meet the amount of air to be charged with the vapor of the hydrocarbon used as may be demanded, either for illuminating or for heating purposes; and as is also evident this apparatus may be used for charging air with vapor or for increasing the amount of illuminating or heating elements in charged air or gas.

The air-inlet of this apparatus is marked *l*. The outlet or delivery pipe is marked *m*. The pipe marked *n*, which is shown connected to the delivery-pipe and opening into the space *k* and having a cock or key, *o*, is for the purpose of allowing air from the space *k* to pass into and commingle with the charged air or gas in the delivery-pipe, and thus reduce the quality of the gas, as in cases where it is too rich in carbonaceous elements. This pipe *n*, therefore, may perform important functions. Each chamber has a try-cock, *p*, and a draining-outlet, that of the lower chamber being shown in Fig. 1 at *q*.

In using this apparatus the hydrocarbon is poured into the upper chamber through the tube in the cap which is covered by the screw plug or nut *r*, and into the lower chamber through the tube *j*, covered by the screw-plug *s*. When the try-cocks indicate that the fluid has reached their height or sufficient quantity has been supplied, which quantity will not be up to the lower ends of the metal tubes *c*, by capillary attraction the cotton or fibrous tubes will become saturated with the liquid. The air then coming in through the inlet *l* will pass down the tubes *c* upon the surface of the fluid and through the saturated tubes *b*, from the surrounding space of which, in the lower chamber, it will be carried through the tube *j*, into the space above the head of the upper set of tubes, and down the tubes *c* of this set, through the tubes *b*, into the space surrounding the tubes of this chamber, and then pass out at *t* into the delivery-pipe. The air will thus be fully and

completely exposed to the fluid and be as fully charged with the vapor thereof as it can possibly be by any piece of this kind of apparatus. In case only one set of tubes in the one chamber be required, or several sets of tubes in several chambers, the proper and necessary arrangement of the pipes for inlet, outlet, conducting, and for all other purposes will readily occur to the mind of any individual accustomed to the construction and use of this kind of apparatus.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The vertical tubes *b* for exposing the fluid of the hydrocarbon to the current of air, substantially as herein recited.

2. The arrangement of the vertical metal tubes *c*, or their equivalents, in relation to the tubes *b*, as herein described.

This specification signed this 6th day of March, 1865.

J. F. BIRCHARD.

Witnesses:
THOS. T. EVERETT,
L. I. JONES.