C. C. DUSENBURY & W. H. WINN.

Gas and Air Carbureter.

No. 204,413. Patented May 28, 1878.

Fig. 1.

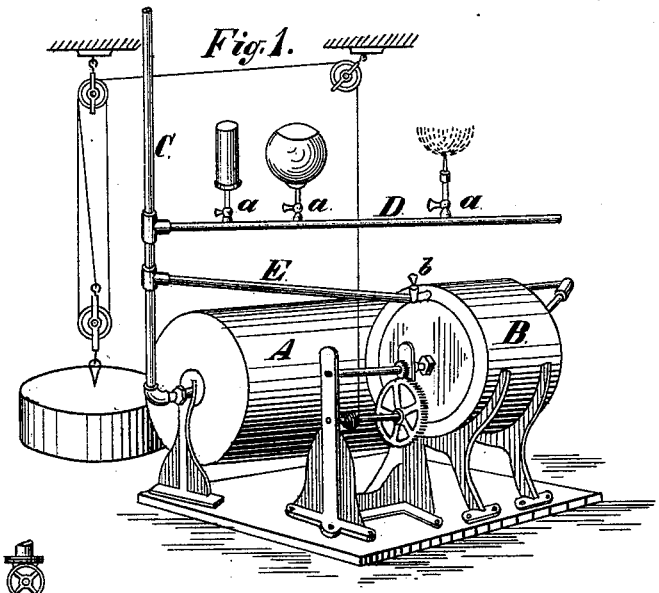


Fig. 2.

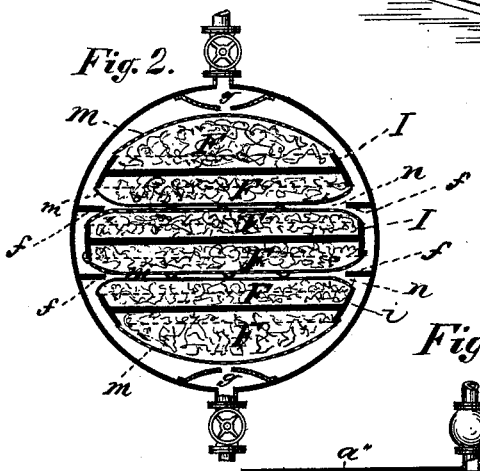


Fig. 3.

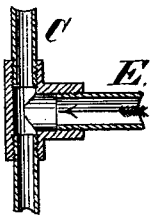
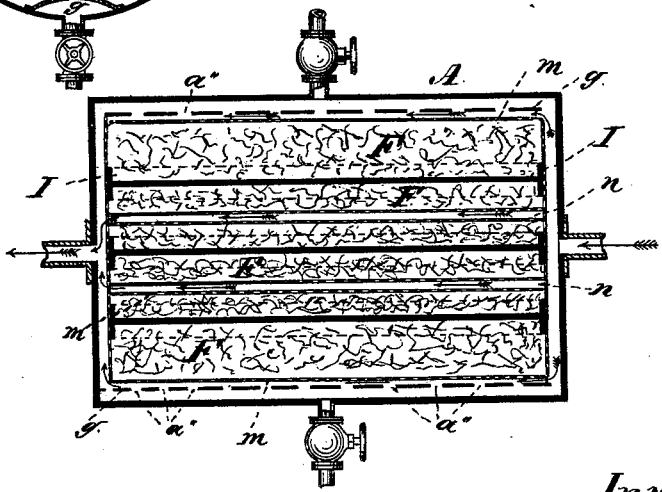


Fig. 4.



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per James A Whitney Atty

UNITED STATES PATENT OFFICE.

C. COLES DUSENBURY AND WILLIS H. WINN, OF NEW YORK, N. Y., ASSIGNORS TO WINN MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN GAS AND AIR CARBURETERS.

Specification forming part of Letters Patent No. **204,413**, dated May 28, 1878; application filed March 18, 1878.

To all whom it may concern:

Be it known that we, C. COLES DUSENBURY and WILLIS H. WINN, both of the city, county, and State of New York, have invented certain Improvements in Gas and Air Carbureters, of which the following is a specification:

This invention is, in part, an improvement upon the invention set forth and described in Letters Patent of the United States issued to Willis H. Winn, June 16, 1877, and relates to that class of carbureters in which the carbureting-liquid or hydrocarbon is distributed through sawdust, fibrous material, or other absorbent substance, and thereby held in such relation to the current of air to be carbureted that said current will readily absorb the hydrocarbon.

The said invention comprises certain novel combinations of parts, whereby provision is made for the saturation of the absorbent material not only by the downward flow of the liquid hydrocarbon therethrough, but also by capillary attraction from below, so that the surfaces with which the gas or air is passed, and from which the liquid hydrocarbon is taken up, are kept supplied with said hydrocarbon, and a very considerable increase of the area of said surfaces also is secured, and whereby provision is made for the utilization of all the hydrocarbon placed in the apparatus, a carbureter of greatly-increased utility and economy, as compared with those hitherto in use, being by this means provided.

Figure 1 is a perspective view of an apparatus made according to my said invention. Fig. 2 is a transverse sectional view of the carbureting-cylinder. Fig. 3 is a longitudinal sectional view of the same, and Fig. 4 is a detail view of one part of the apparatus.

A is the carbureting-cylinder, and B the air-pump or air-forcing apparatus, by which the air taken from the outer atmosphere is forced through suitable pipes into the carbureting-cylinder A, and thence into the outlet-pipe C.

The construction and arrangement of the carbureting-cylinder A and the air-pump or air-forcing apparatus B, and their connection with each other, also the means by which the moving parts are operated, may be made as set forth and described in the Letters Patent issued to Willis H. Winn on the 26th day of June, 1877.

From the pipes C extend any desired number of pipes, D, connecting with any suitable burners *a*, this arrangement of the distributing-pipes D being of any kind suitable in the use of gas for illuminating purposes.

E is a pipe, connecting with the pipe C at a point between the carbureting-cylinder A and the point at which the distributing pipe or pipes are attached to the aforesaid pipe C, the opposite end of the pipe E communicating with the air-pump or air-forcing apparatus B, and being provided with valve or cock *b*. This arrangement is such that, by turning the valve or cock *b* to open the passage through the pipe E, the operation of the pump or air-forcing apparatus B will cause a portion of air taken from the outer atmosphere to pass into the pipe C within the said pipe, and intermittently mingle with the highly-carbureted gas passed into said pipe from the carbureting-cylinder A, the forcing of the air, as just described, into the said pipe C at an angle to the direction in which the highly-carbureted gas is flowing through the pipe C insuring the dilution of the gas to the requisite degree, so that by this means the gas, although it may issue from the carbureting-cylinder A so heavily surcharged with hydrocarbon that deposits would be certain to congregate within the distributing-pipes, &c., and the flame of the gas in burning would be smoky and obscure, yet it is, by its dilution by the air, as just set forth, reduced to that standard which, while fulfilling all the conditions of superior illumination, will prevent the deposit of surplus hydrocarbon in the distributing-pipes, and also the smoking of the flame at the burners, as just hereinbefore indicated.

In order, moreover, to secure a gas perfectly saturated, and to avoid the ineffective application of the liquid hydrocarbon to that purpose within the carbureting-cylinder A, there are provided within the said cylinder A three or more sets of double pans, I, which

contain the sawdust, fibrous material, or other suitable absorbent, F, the two pans of each set having their openings in opposite directions, as shown more fully in Fig. 2, and over each pan is placed a wire-cloth screen, *m*. The screens of adjoining pans are keep from bulging toward each other by studs *i*, interposed between, as represented in Fig. 2. These screens retain the absorbent F in the pans and separate the absorbent in each pan from that in the adjoining pan, as shown at *n* in Figs. 2 and 4, and also retain the absorbent at a suitable distance from the top and bottom of the cylinder. As a consequence of this construction, the gas or air to be carbureted, being passed into the cylinder, as hereinafter explained, and passing in contact with the surfaces of the several masses of absorbent material, is enabled to come in contact with a much larger area of absorbent material, and consequently to become far more effectually saturated with the hydrocarbon than if the absorbent material were simply placed within the cylinder without provision for increasing the area presented to the contact of the gas or air to be carbureted. But this is not all. While the cylinder remains in one position it is manifest that the liquid hydrocarbon placed therein will flow downward through the absorbent to saturate the same; but when the supply of hydrocarbon upon the surfaces becomes measurably diminished by the removal of the hydrocarbon taken up by the air or gas brought in contact therewith, another operation intervenes—the liquid hydrocarbon passes by capillary attraction to the aforesaid surfaces. Inasmuch as this capillary attraction produces a practical and useful result only when exercised within narrow limits as to the distance traversed, it follows that the division of the absorbent into separate parts by means of the several sets of double pans, as herein described, diminishes the thickness of the several parts of the mass to be traversed by the hydrocarbon in passing to the surfaces, as aforesaid, and enables the hydrocarbon to be supplied by the capillary attraction to the parts or places where the current of air or gas may come in contact therewith.

There is also this further function performed by said screens, that when the position of the cylinder is reversed the absorbent in the pans brought lowermost will fall upon the screens, so that more or less space will be left between said absorbent and the inverted bottom of the pans, whereupon the air or gas to be carbureted passes into said space; and, aside from the increased area given by subdividing the mass of absorbent, as explained, there is the further area added by this exposure of the inner surface of the absorbent in each of the inverted pans. Inasmuch as in the reversal of the cylinder the hydrocarbon is liable to adhere and flow along the inner surfaces of said cylinder, longitudinal deflecting-plates *f* are provided at the opposite sides thereof and extended inward between the pans F, so that the flow of the liquid hydrocarbon is arrested and directed inward, so that said liquid will pass readily into the adjacent pans.

At the upper and lower sides or portions of the cylinder is a partition, *g*, extending the whole length of said cylinder, and either formed with a longitudinal row of perforations, *a''*, as shown in Fig. 4, or with a single slit extending nearly or quite their whole length, the object of these partitions being that the comparatively small portion of liquid hydrocarbon which may escape the deflecting action of the plates *f* will pass downward through the perforations and be collected in the lowermost portion of the cylinder A, and when said cylinder is reversed will flow out through the perforations, and be thereby more thoroughly distributed to the interior of the cylinder, instead of flowing back along the surface of the said cylinder.

What we claim as our invention is—

1. In a carbureter, three or more sets of double shallow pans for holding a capillary absorbent, said pans extending the entire length of the carbureting-cylinder, and having spaces between them for the passage of the gas or air to be carbureted, substantially as herein set forth, for the purpose specified.

2. The combination of the wire-gauze screens with the double pans F within the carbureting-cylinder, substantially as and for the purpose set forth.

3. The deflecting-plates *f*, in combination with the pans I within the carbureting-cylinder, substantially as and for the purpose herein set forth.

4. The partitions *g*, perforated or slotted longitudinally, extended nearly or quite the length of the carbureting-cylinder, and arranged at the upper and lower parts of the latter, substantially as and for the purpose herein set forth.

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