(No Model.) 2 Sheets—Sheet 1.

C. B. DUDLEY.

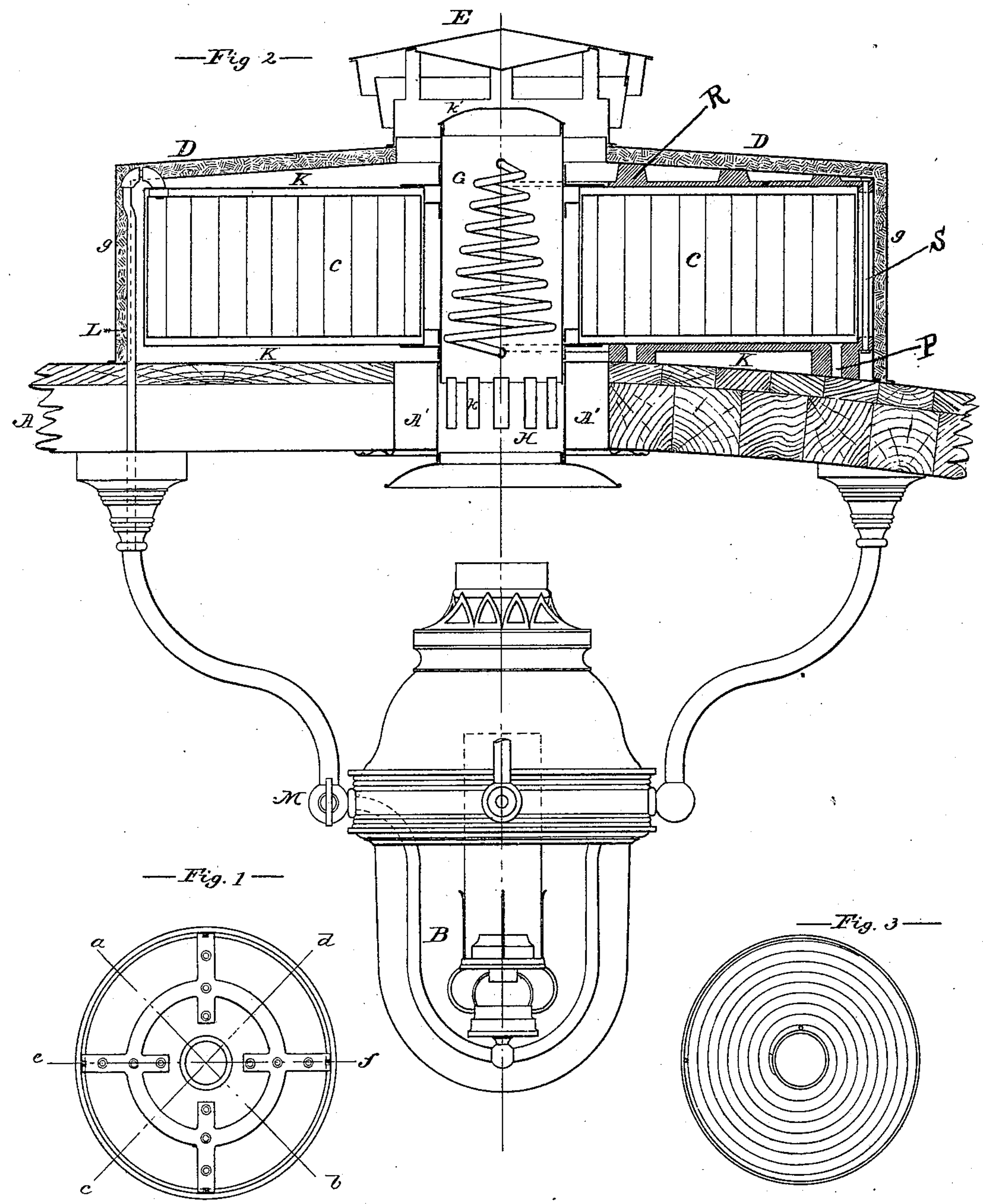
APPARATUS FOR CARBURETING AIR OR GAS.

No. 342,863. Patented June 1, 1886.

Fig 2

Fig. 1

Fig. 3



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(No Model.) 2 Sheets—Sheet 2.

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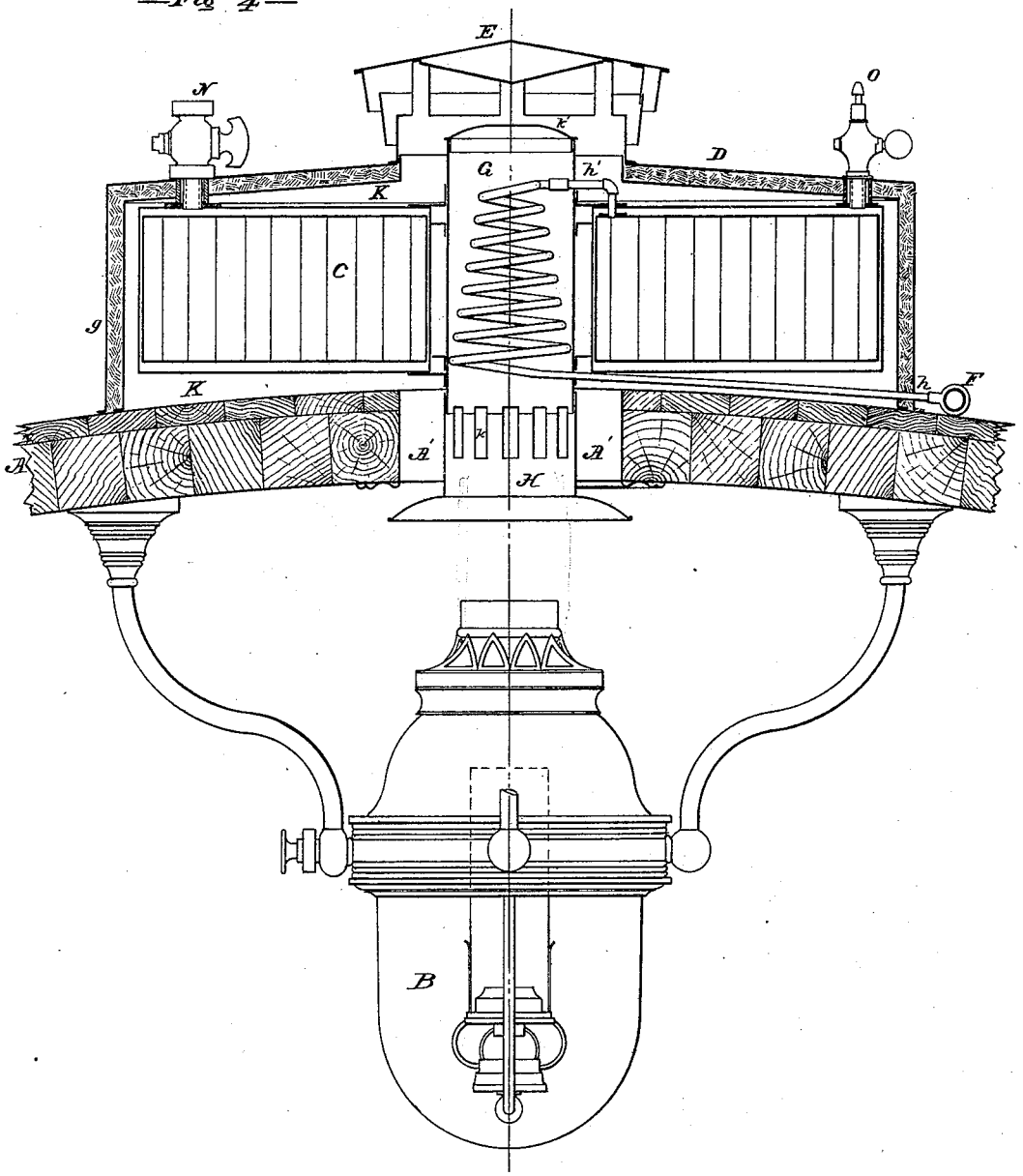
—Fig. 4—



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CARBURETING AIR OR GAS.

SPECIFICATION forming part of Letters Patent No. 342,863, dated June 1, 1886.

Application filed November 21, 1885. Serial No. 183,485. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. DUDLEY, of Altoona, county of Blair, and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Carbureting Air or Gas, of which the following is a full, true, and accurate description, reference being had to the accompanying drawings, which form a part of this specification.

In carbureting air or gas by passing it through a carburetor containing a solid or liquid carbureting material there is a large consumption of heat due to the vaporization of the carbureting material, and if the air or gas is cold, or if the hydrocarbon or other carbureting material is or becomes chilled, the vaporization is slow, and a much larger quantity of gas is required to produce a light of a standard intensity, if, indeed, the standard can be at all maintained.

The object of my invention is to provide a constant supply of heat to insure the vaporization of the carbureting material under the best and most economical conditions. This I accomplish, first, by heating the air or gas to be carbureted before it is forced into the carburetor, and, second, by heating the carburetor itself. The sources of heat which I prefer to use are the hot gases arising from the burner, supplied by the carburetor, and the air of the room or chamber in which the burner is situated. These two sources of heat may be used independently of each other or conjointly, or either one of them may be used alone, as circumstances render desirable or necessary.

My invention will be especially useful as applied to railway-cars or similar chambers with which it is desirable to use a carburetor situated on the outside, and, in consequence, exposed to atmospheric changes in temperature as heretofore constructed.

My invention accordingly consists, first, in providing means for heating the air or gas immediately before it is forced into the carburetor; second, in the combination of a carburetor situated in a flue leading from the chamber wherein the lamps are used with devices whereby the air or gas is heated before being forced into the carburetor; and, thirdly, in the combination and arrangement of the parts of the lighting system hereinafter fully described, and shown in the drawings which illustrate my invention, as applied to a railway-car, and in which—

Figure 1 is a plan view of the carburetor and its support on the roof of the car. In this view the line *a b* is lengthwise of the car and *c d* transverse of the car, *e f* being forty-five degrees from each of these lines. In Fig. 2 the left-hand half is a section through the carburetor, car-roof, and lamp on the line *a b*, and the right-hand half is a section of the same on the line *e f*. Fig. 3 is a horizontal section through the carburetor. Fig. 4 is a section through the carburetor, car-roof, and lamp, taken transversely of the car on the line *c d*.

A is the car-roof, having one or more openings, A′.

B is the lamp or burner.

C is the carburetor, which is supported on and above the roof by the casting shown in Fig. 1. This supporting-frame is screwed to the car-roof, as shown at P. A similar casting, R, is held to the lower one by the small bolt S, which casting serves the double purpose of helping to hold the carburetor in place and forming a support for the casing D. This casing D has its walls, by preference, double and packed with non-conducting material, as indicated at *g*.

E is a cowl.

F is a pipe leading from the air-brake or other source of air or gas supply to the carburetor.

G is a spiral coil of pipe placed in the flue, and connected with the pipe F and with the carburetor by the pipes *h* and *h′*.

H is a flue, through which the hot gases escape through the roof of the car. I prefer to provide it with openings *k k* below the carburetor and with a removable contracted cap, *k′*.

K K is a free space or flue leading from the interior of the car around the flue H and carburetor C to the cowl E.

L is the pipe leading from the carburetor to the burner.

M is the cock for turning the gas on or off.

N is a stop-cock, through which the gasoline is introduced into the carburetor.

O is another stop-cock, which is connected

with the bottom of the charging-can by a rubber hose, to equalize the pressure when the carburetor is being filled with gasoline.

The carburetor C, which is shown in the drawings, is internally constructed with a spiral partition, as shown in Fig. 3, and is packed with wick; but any other carburetor may be used, if desired. I have found it desirable to make it annular in shape, and to secure it on top of the car, so that its central perforation shall be concentric with the opening in the car-roof. The carburetor is also fastened to the top of the car in such a way as to leave a free space, K, between them.

Passing through the central perforation of the carburetor is the flue or chimney H, in which is placed the spiral pipe G, through which the air from the air-brake system passes on its way into the carburetor at *h'*. This spiral coil G being directly in the path of the hot gases rising from the burner, the air is highly heated before it enters the carburetor, and in passing through the spiral interior of the reservoir from *h'* to the pipe L at its outer extremity it imparts its heat to the gasoline. Of course this pipe G may be bent into other forms besides the spiral coil shown, any conduit which is exposed to the heat of the gases from the burner being its manifest equivalent.

Around and above the carburetor C, I place the casing D, secured tightly to the car-roof, and having substantially non-conducting walls, preferably made double, and packed as shown at *g*. A space, K, is left between the casing and the carburetor, which makes a flue leading from the car to the cowl E, through which the air from the interior of the car is constantly escaping, so that the carburetor is always in an atmosphere of the temperature of the interior of the car, and the gasoline, even in cold weather and while the lamp is unlighted, cannot become chilled.

When it is desired to increase the amount of heat given to the outside of the carburetor for any reason—as, for example, when the air that would naturally pass through the flue *k'* is not as warm as is desired—the flue H may be partially closed at its top either by the insertion of a perforated cap—such as *k'*—or by means of a damper. The hot gases will then be in part forced to escape through the openings *k* into the flue K K, and in passing around the carburetor will impart much of their heat to the contained gasoline; or, if desired, all of the hot gases may be forced to pass around the carburetor.

In filling the carburetor C, in which the air is under pressure, it is necessary that the nozzle of the oil-can should fit closely to the filling-cock N. The cock O should also be connected with another opening in the can by a hose or otherwise, and both cocks being then opened the reservoir may be filled without allowing the contained air to escape or lowering the pressure.

Among the advantages which are obtained by means of my described construction, the chief is of course the utilization of the heat of the car or chamber and of the lamp to keep the gasoline at a sufficiently high temperature in all conditions of the weather, whereby the light is kept to its maximum efficiency and the consumption of air prevented from becoming so great as to interfere with the supply for the brakes. The air is also drawn from the car or chamber in the best place to promote a proper ventilation, and, in addition, its position on the top of the car increases the ease and safety with which it can be filled and otherwise cared for.

Another and important advantage obtained by placing the carburetor on top of the car and over or near the lamp is the short connection between the carburetor and the burner, which is not long enough to permit any appreciable loss of heat or condensation of gasoline vapor after it leaves the carburetor.

The construction and combination of the carburetor casing, flues, and other parts which I have shown and described, are especially designed for use with railway-cars, and for such use have been found thoroughly efficient; but it is by no means intended to confine the construction described to railway-car lighting alone.

It is believed that the improvements described in this application will be useful in the lighting of street-cars, ferry-boats, depot-sheds, block-signal towers, and indeed anywhere where the carburetor can be so placed as to utilize in the manner described the heat from either or both of the two sources mentioned in the first part of this application.

It will of course be evident that many of the described features of my invention are capable of separate as well as conjoint use, and that considerable changes may be made in the form and relative arrangement of the parts without departure from my invention, those described being, I believe, the best and most efficient.

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

1. In combination with a carburetor and a heated flue, a coil, G, or its equivalent, situated in said flue and close to the carburetor, whereby the air or gas is heated immediately before being forced into the carburetor, substantially as specified.

2. In combination with a lamp for burning carbureted air or gas, and a carburetor, a flue or chimney situated above said lamp and inclosing a coil of pipe or its equivalent, through which the air passes and is heated on its way from the source of supply to the carburetor, substantially as specified.

3. In a railway-car or other chamber having lamps for burning carbureted air or gas, the combination of a carburetor placed on top of said chamber and inclosed in a passage or flue through which heated air is allowed to escape, with a heated flue, and a coil, G, or its equivalent, situated in said flue and close to the car-

buretor, whereby the air or gas is heated immediately before being forced into the carburetor, substantially as specified.

4. In combination with a car or other chamber provided with lamps for burning carbureted air, an annular carburetor situated above the roof of said chamber, and inclosed in a passage or flue through which the air is allowed to escape from said chamber, and having a flue or chimney for the escape of the hot gases from the lamp passing through its central opening and inclosing a coil of pipe, or its equivalent, through which the air passes and is heated on its way from the source of supply to the carburetor, all substantially as shown and described.

5. In combination with a railway-car or other chamber having a lamp, B, the carburetor C, having central flue, H, situated on the roof of the chamber, and the casing D, having non-conducting sides *g* and cowl E, the carburetor being so supported as to leave a continuous passage, K K, between itself, the roof, and the casing, all substantially as shown and described.

6. In combination with the lamp B, carburetor C, and casing D, arranged substantially as shown and described, the flue H, having openings *k*, and means for contracting the opening at its top, substantially as shown and described.

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WM. K. SHRYOCK.