

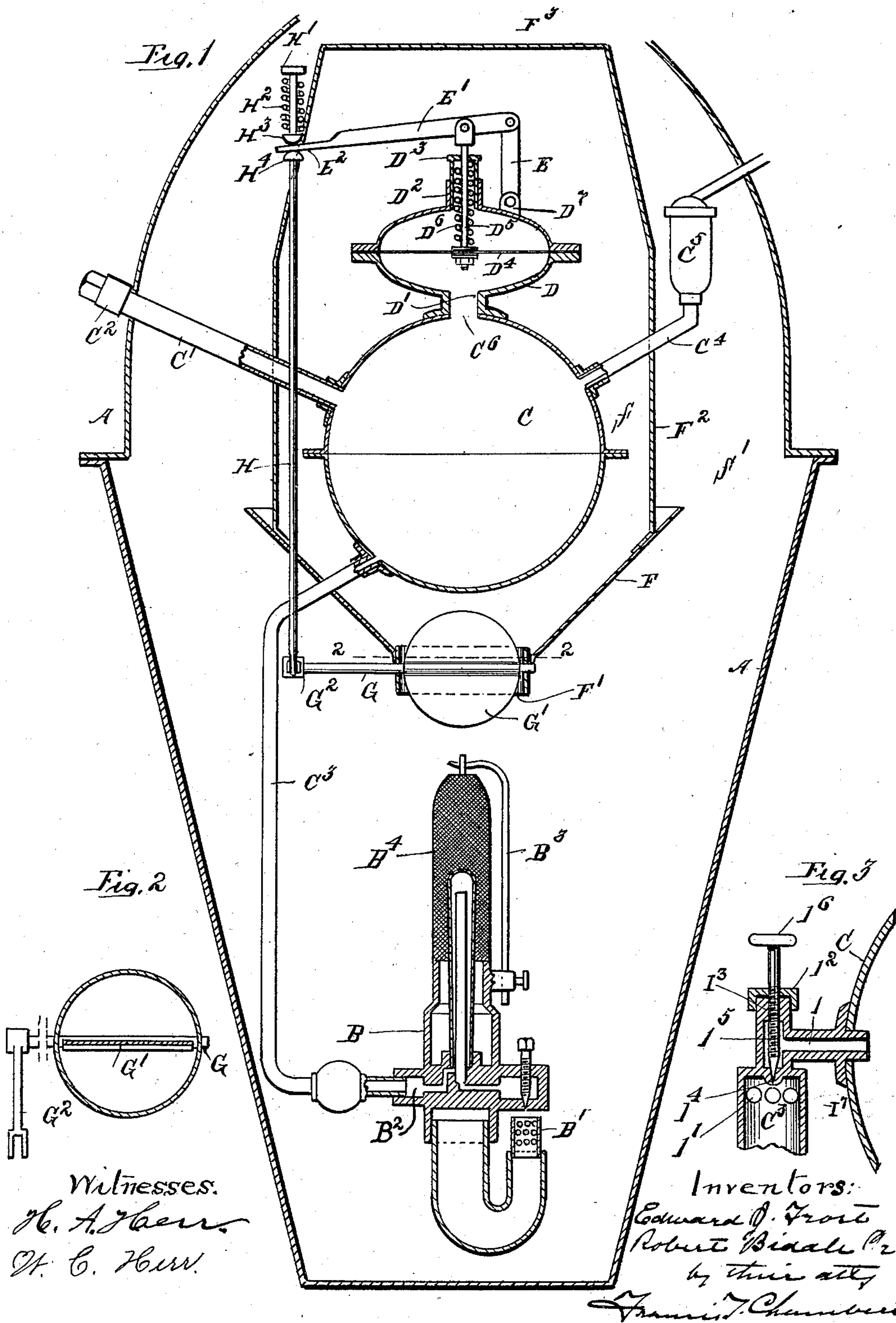
No. 638,107.

Patented Nov. 28, 1899.

E. J. FROST & R. BIDDLE, JR.
OIL BURNER REGULATING DEVICE.

(Application filed Mar. 16, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

EDWARD J. FROST, OF PHILADELPHIA, PENNSYLVANIA, AND ROBERT BIDDLE, JR., OF RIVERTON, NEW JERSEY.

OIL-BURNER-REGULATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 638,107, dated November 28, 1899.

Application filed March 16, 1899. Serial No. 709,266. (No model.)

To all whom it may concern:

Be it known that we, EDWARD J. FROST, residing in the city and county of Philadelphia, in the State of Pennsylvania, and ROBERT BIDDLE, Jr., residing in Riverton, Burlington county, State of New Jersey, citizens of the United States of America, have invented a certain new and useful Improvement in Oil-Burner-Regulating Devices, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

Our invention relates to burners adapted to burn oil or the vapor of oil and provided with an oil-reservoir from which the burner draws its supply.

The object of our invention is to provide a simple and efficient automatic regulation of the supply of oil to the burner; and our invention consists, broadly speaking, in providing for the heating of the oil-reservoir by the products of combustion from the burner and in providing automatic means by which such products of combustion will be in increasing proportion automatically shunted through a flue out of contact with the reservoir as the heat of the reservoir and the consequent pressure of gas therein increase. Operating in this way it is obvious that the pressure in the reservoir can be maintained at practically the same point and the consequent pressure in the burner maintained also at a uniform point.

Reference is now had to the drawings, in which we have illustrated our invention as applied to a street-lamp, and in which—

Figure 1 is an elevation of a generally diagrammatic character, showing our invention as conveniently applied to a street-lamp. Fig. 2 is a cross-section taken on the line 2 2 of Fig. 1, but with the damper in a changed position; and Fig. 3 is a view illustrating a modification of the apparatus.

A indicates, diagrammatically, the outer framing or case of the lantern.

B is the burner, B' indicating the opening for air leading to the burner.

B² is the passage for oil, leading to the burner, and B³ a standard arranged to support a filamental mantle, (indicated at B⁴.)

C indicates the oil-reservoir, which is preferably placed, as shown, immediately over the

burner B, so as to be in the direct line of the arising products of combustion.

C' indicates the filling-tube, having a cap C².

C³ is the delivery-tube for oil, which, as shown in Fig. 1, leads from near the bottom of the reservoir and connects with the passage B², leading to the burner.

C⁴ is a pipe leading from the upper part of the reservoir and having situated therein a safety-valve—for instance, at the point indicated at C⁵.

C⁶ is the passage leading from the top of the reservoir C and connecting with a passage D', leading into the diaphragm-chamber D, which is made, as shown, of two sections, between which is secured a diaphragm D⁴. The upper section is formed with a central tubular aperture D², into which screws a cap D³, the pressure of which is regulated by adjusting the cap.

D⁵ is a rod connected with the diaphragm, as shown, and passing upward through the tube D² and cap D³.

D⁷ is a lug formed on the upper section of the diaphragm-box and to which is pivotally connected a link E, to the upper end of which in turn is pivotally connected a lever E', to which in turn the rod D⁵ is connected and the free end E² of which is, as shown, passed between the curved abutments H³ and H⁴, which in turn are connected with a rod H through a spring H², situated between the abutment-block and a head H' on the rod H.

G is a shaft having bearings in the walls of the tubular pipes F', to be hereinafter described, and to which shaft is attached the damper G', adapted to close or nearly close the tube F' or in another position to leave the said tube practically open.

G² is a lever-arm secured to the shaft G and to the end of which is pivotally connected the rod H.

The tube F' is situated, it will be observed, immediately between the burner and the oil-reservoir C, and it forms the opening into a flue-passage embracing the reservoir C and formed, as shown, by a conical diaphragm F and a tubular extension F², the top G³ of which is open. This flue is indicated as a whole by the symbol *f*. Another flue is formed between the outer spaces of the conical dia-

phragm F and tubular extensions F² and the outer walls A of the lantern.

As shown in Fig. 1, our burner is connected with the lower part of the oil-reservoir, so
 5 that it will receive the oil from the reservoir. Our invention, however, is equally applicable to a construction in which the burner is fed with an oil-vapor mixed with air, and for
 10 such use a passage, as c³, (see Fig. 3,) leads from the upper part of the reservoir C, connecting with a tubular extension I, which leads into a chamber I' having a small passage I⁴ at its bottom and its upper end, as shown, closed by a screw-cap I², through a stuffing-
 15 box I³ of which passes a regulating-spindle I⁵, the handle of which is indicated at I⁶. The nozzle I⁴ projects into the end of the connecting-tube C³, which for use with oil-vapor should be of somewhat larger dimensions than
 20 is shown in Fig. 1 and should also have near its top a series of air-openings I⁷, through which air will be drawn by the issuing jet of vapor and mixed with vapor before it enters the burner.

25 Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A burner and an oil-reservoir connected with and supplying oil to said burner in combination with two flues for the burner-gases,
 30 one embracing the reservoir and the other passing to the side thereof, damper mechanism for regulating the passage of gases through said flues, a movable device, as dia-

phragm D⁴, arranged to move in or out as the pressure in the reservoir varies and means for moving the flue-damper actuated by said movable device. 35

2. A burner and an oil-reservoir connected with and supplying oil to said burner in combination with two flues for the burner-gases
 40 one situated immediately above the burner and embracing the reservoir and the other passing to the side thereof, a damper arranged to regulate the opening into the direct flue, a movable device, as diaphragm D⁴, arranged
 45 to move in or out as the pressure in the reservoir varies and means for moving the flue-damper actuated by said movable device.

3. A burner and an oil-reservoir connected with and supplying oil to said burner in combination with two flues for the burner-gases
 50 one embracing the reservoir and the other passing to the side thereof, damper mechanism for regulating the passage of gases through said flues, a diaphragm-chamber connected with the reservoir, a diaphragm secured across said chamber, a spring arranged
 55 to press the diaphragm in a direction opposite to that in which it is moved by pressure generated in the reservoir and means for moving the flue damper actuated by said diaphragm. 60

EDWARD J. FROST.
 ROBT. BIDDLE, JR.

Witnesses:

CHAS. F. MYERS,
 D. STEWART.