2 Sheets—Sheet 1.

R. LAVENDER.

BLAST-LAMP.

No. 180,246. Patented July 25, 1876.

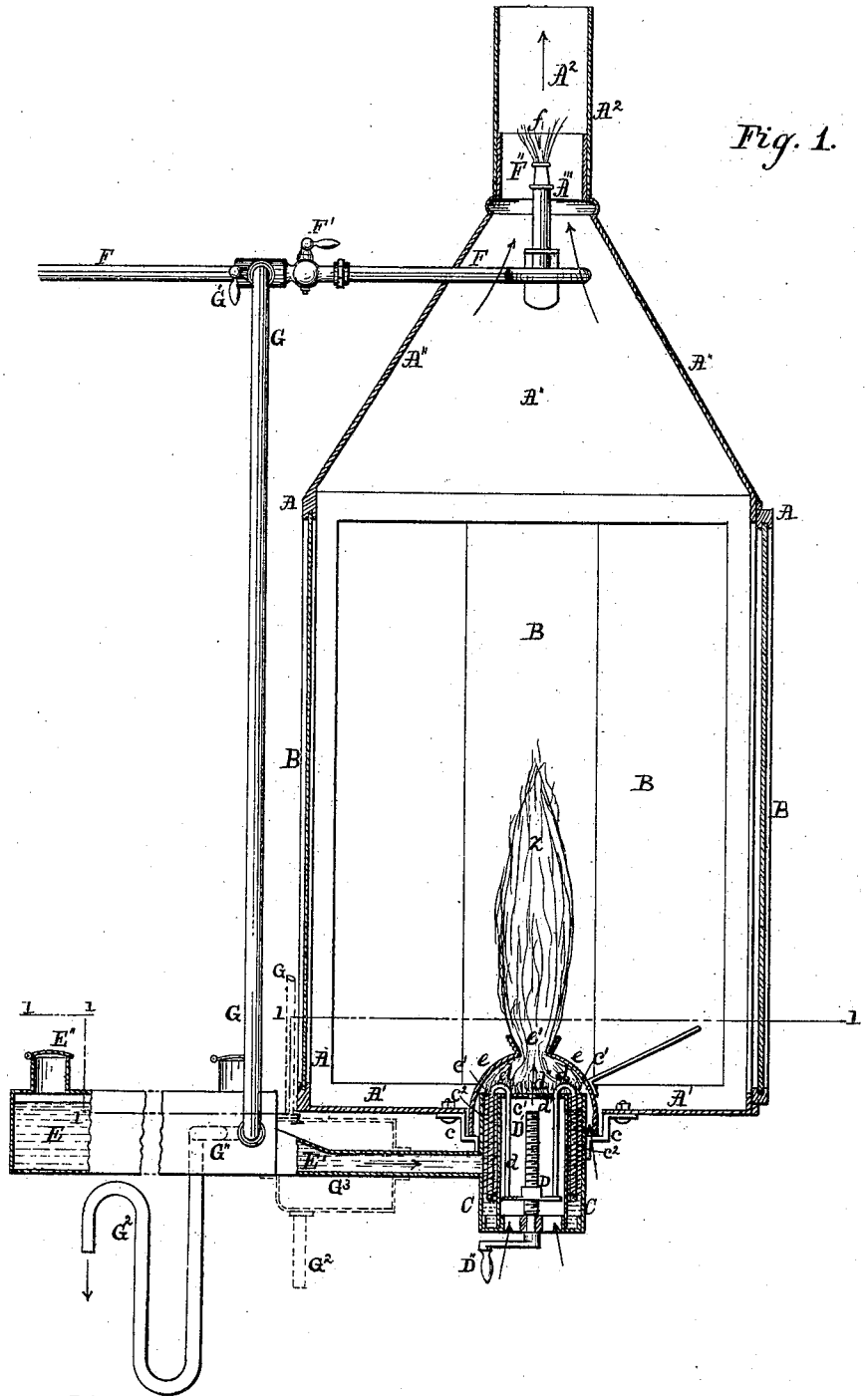

Fig. 1.

Witnesses:
Thomas Russell
John Brown

Inventor:
Robert Lavender

2 Sheets—Sheet 2.

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BLAST-LAMP.

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Fig. 2.

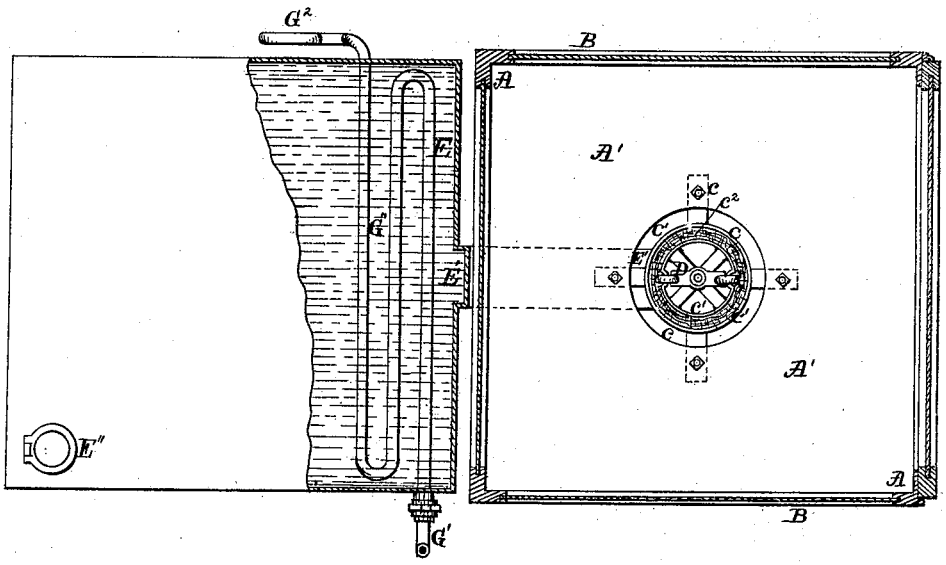
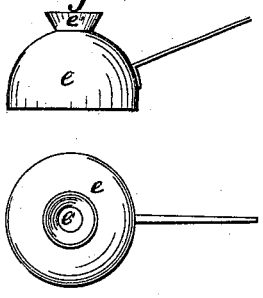


Fig. 3.



Witnesses:

Thomas Russell

John Brown

Inventor.

Robert Lavender.

UNITED STATES PATENT OFFICE.

ROBERT LAVENDER, OF KIRKCALDY, GREAT BRITAIN.

IMPROVEMENT IN BLAST-LAMPS.

Specification forming part of Letters Patent No. **180,246**, dated July 25, 1876; application filed June 2, 1876.

To all whom it may concern:

Be it known that I, ROBERT LAVENDER, of Kirkcaldy, in the county of Fife, Great Britain, oil merchant, have invented new and useful Improvements in Blast-Lamps, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention has reference to a new or improved means of producing the draft or blast of air in or for lamps, and which enables them to burn better with the heavier class of hydrocarbon and other oils than has been found practicable heretofore; and the nature and novelty of the invention consist in drawing in the air through an annular or other shaped space at the bottom of the lamp. This draft is produced in a new manner, as applied to lamps, namely, by suction, caused by the action of a small jet of steam (or it might be of air or other gaseous fluid) through a nozzle at the neck or throat of the escaping-funnel, above the light. In other respects the lamps may be made of any ordinary construction, the essential feature of novelty being the causing of the draft, and assisting combustion, by exhausting the waste or burnt gases through the exit-funnel by the action of a blast or jet of steam, air, or other vapor or gaseous fluid. This jet of steam or other pressure elastic fluid is brought from any suitable contiguous pressure-generating vessel, through ordinary tubes or pipes, so as to draw and force or eject the burnt or waste gases out of the lamp through the funnel, which produces a partial vacuum within the lamp, and causes the air entering from below to rush in toward the flame, to assist combustion and lengthen the flame.

The force of the blast-jet is regulated by a reducing-valve, or hand tap or valve, fitted on the steam or blast pipe near the lamp; and, to assist the lateral action of the blast-jet, the exit-funnel of the lamp may be made slightly trumpet-shaped toward the outer end.

Figures 1 and 2 are, respectively, a sectional elevation and a horizontal section, taken on the irregular line 1 1 in Fig. 1, with the flame-directing chimney *e* removed, of a blast-lamp constructed in accordance with, and illustrative of, one modification of my said invention or improvements.

The lamp represented in these figures is of the large one-flame class, suitable for lighting up the works round mine-shafts, yards, sheds, and large workshops, iron-works, founderies, and other public works, and also railway-stations, harbors, and other places where strong light is required.

Referring to the construction of the lamp shown in these figures, A is the frame of the lantern, inclosing the light, in this case made square, with glass B′ in the four sides, preferably inserted in narrow strips, to lessen the liability to breakage of the glass by sudden heating and cooling, and with a sheet-metal bottom at A′, (but this might be of glass also,) having the paraffine or oil-burning lamp proper C secured thereto by four brackets, *c*, and projecting some little distance up through a hole in its center, leaving a small annular space, *c′*, for the admission of air to the burning wick, the flame from which projects in a long cylindrical or candle-flame shaped column, *z*, up the center of the lamp toward the top or crown A″, which is preferably beveled on all sides in the form of a pyramid toward the center A‴, where it is fitted or formed with a long cylindrical or slightly trumpet-shaped exit-funnel, A^2.

The lamp C is made in a somewhat usual form, with an outer and inner shell, C C′, respectively, leaving the annular space or vessel at C″ close below and open above, for the reception of the oil or other hydrocarbon liquid to be burned, and the annular wick C^2, which is raised and lowered by two or more pronged wires or wick-carriers, *d*, attached to a movable cross-head, D, through which the revolving screw-spindle D′ works, actuated by the handle D″ below, so as to raise and lower the cross-head D and wick C^2, as desired, within the central cylindrical air-space C′, which is preferably open below, but closed above by the plate *d′*, through which the forks *d* work, but having a small hole in the center *c″* to supply air to the inside of the burning wick and flame.

The oil is preferred to be kept in the shallow rectangular vessel E at one side of the lamp, large enough to contain oil to supply

the lamp for the night or watch during which it is to be used, and connected at its lower side, by the large duct or pipe E′, to the oil and wick chamber C″, so that when the vessel E is filled with oil by the filling-mouth E″ its upper surface will be nearly on a level with the top *d′* of the lamp C and a little above the bottom A′ of the lantern A, so that no oil would escape at this part, and the pipe E′ would draw off all the oil from the vessel E before the light would die out. The steam-pipe from the boiler is shown at F, controlled by a hand-tap, F′, fitted on it near the top of the lamp, where it enters and is coiled or turned, so as to project up with its extreme open end in the center of the throat at A‴ of the discharge-funnel A^2, where it is fitted with a suitable nozzle, F″, so as to project a jet of steam, as indicated at *f*, out through the funnel, which, by its lateral action, draws out the waste hot gases from the top part A″ of the lantern or case of the lamp A, and so ventilates it, producing a partial vacuum or diminution of the pressure within, which has the effect of drawing in the fresh air to support combustion through the annular space *c* to the flame, as indicated by the arrows in Fig. 1, within the flame cap or chimney *e*, (shown particularly in detached elevation and plan in Fig. 3, and which under these improvements is preferred to be formed of thin iron or other metal contracted conically, or in a dome shape,) to a central orifice a little above and much smaller than that of the burning wick, so as to heat the gases and contract the flame into the smaller central orifice *e′*, from which it springs in the long cylindrical or candle-flame form already described, assisted by suction, toward the discharge-funnel A^2, a small jet of air being also drawn in through the central disk and hole *d′ d″*, as before mentioned, which thus gives a strong and brilliant light radiating equally in all directions.

When steam is used in the pipe F for producing the lateral discharge action of the smoke, a small pipe, G, is led therefrom (controlled by a tap, G′) down into the oil-supply vessel E, and coiled or undulated through the oil, as at G″, so as to heat the oil and prevent it from freezing in cold weather, and insure its constant flow through the tube E′ to the lamp C, or otherwise, as shown in dotted lines in Fig. 1. The tube E′ might be made large and cylindrical, with a close steam-jacket, G^3, round it, into which the steam-pipe G would be led, so as to heat and maintain the oil in a liquid state in passing through the pipe E′ to the lamp without the necessity of the undulating pipe G″, the condensed steam or water from either passing off by a siphon-pipe, G^2, or a tap might be used instead for that purpose.

Although steam has been described as used in this case, high-pressed air or other gases may be used and brought in by the pipe F from a generator, so as to produce the jet *f* and discharge of the gases through the funnel A^2, all as described in reference to steam; and although these improvements have only been described for common lamps and lighting purposes it is to be understood that they may be used with advantage for special purposes, such as for ships' lights, lamps or lanterns, railway carriage and engine lamps, fog-signal lamps, and lamps for large buildings or halls, where gas was not obtainable.

I claim—

In combination with a lamp having a wick, a flame-director, and a transparent chimney or lantern, the blast-pipe F F″, and extended funnel A^2, substantially as set forth.

ROBERT LAVENDER.

Witnesses:

THOMAS RUSSELL,
96 *Buchanan st., Glasgow.*

JOHN BROWN,
96 *Buchanan st., Glasgow.*