A. E. HARTEL.

GAS BURNING LIGHT.

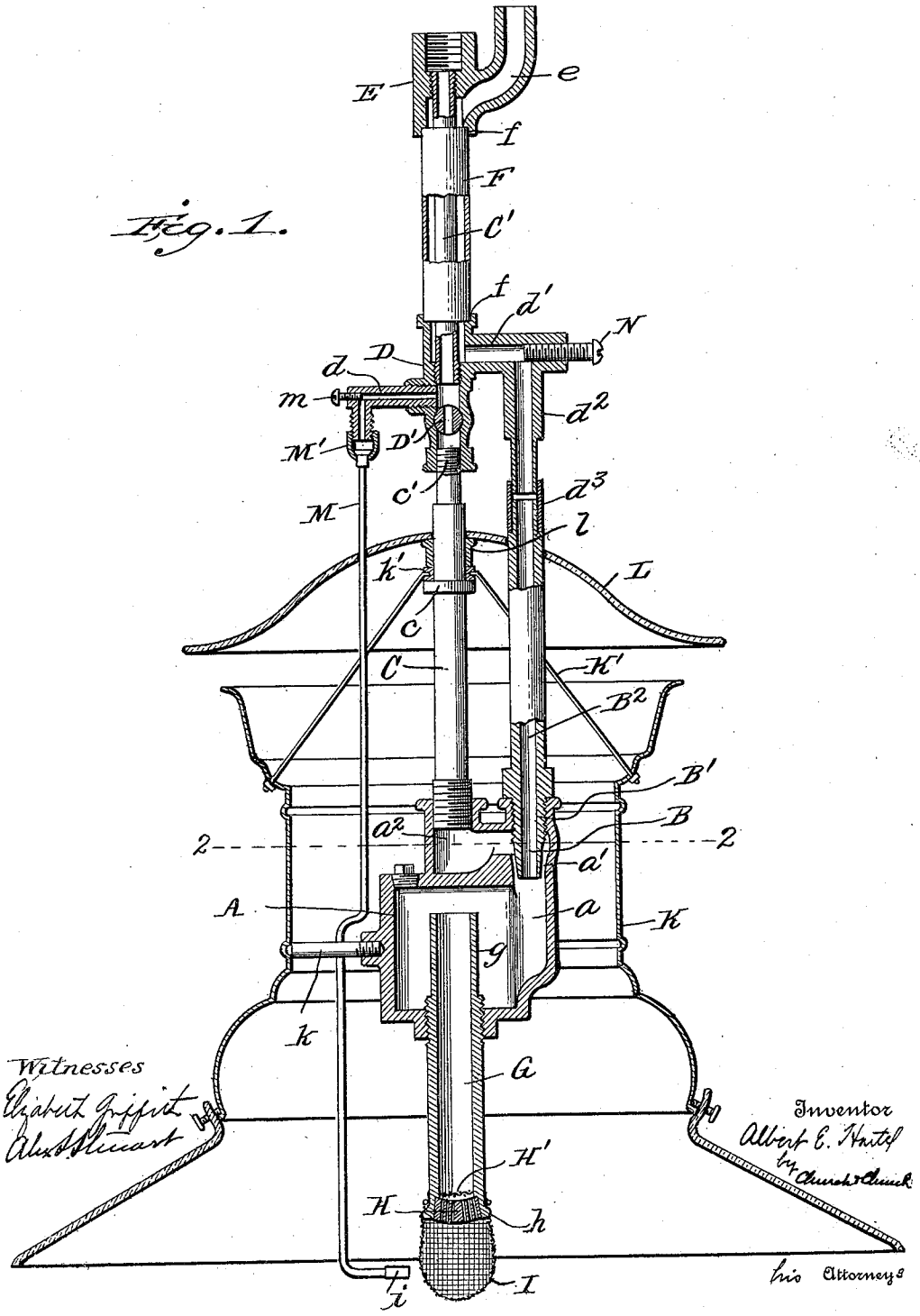
APPLICATION FILED DEC. 23, 1909.

982,271.

Patented Jan. 24, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

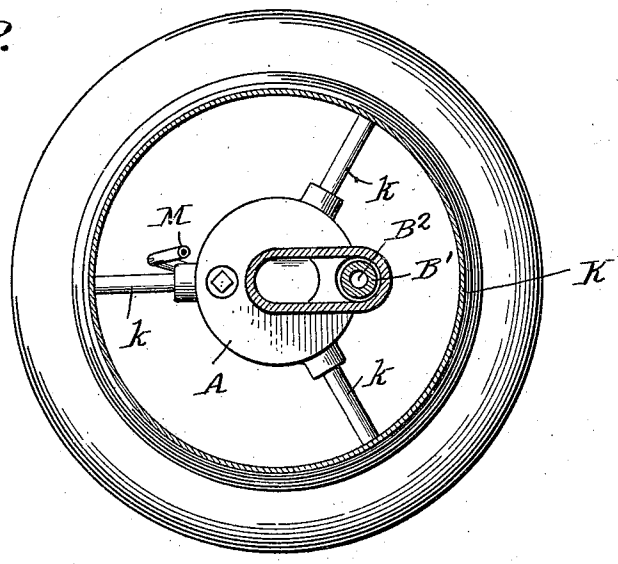
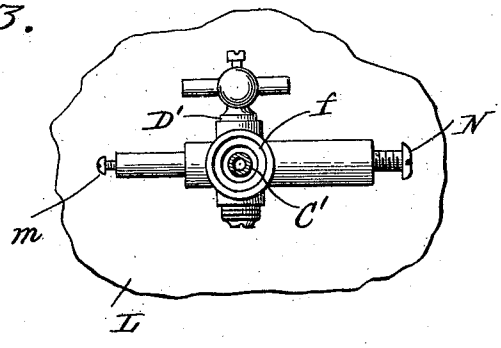


Fig. 3.



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UNITED STATES PATENT OFFICE.

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GAS-BURNING LIGHT.

982,271. Specification of Letters Patent. **Patented Jan. 24, 1911.**

Application filed December 23, 1909. Serial No. 534,657.

To all whom it may concern:

Be it known that I, ALBERT E. HARTEL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Burning Lights; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to gas burning lights, and is more especially adapted for embodiment in that type of gas burning lights in which gas and air under pressure are supplied to a preheating chamber and from which they are conveyed to a burner or burners located below the preheating chamber and adapted to heat the latter through the medium of the waste products of combustion.

The invention is designed primarily as an improvement upon the lamp or burner of my prior Patent No. 726,910, dated May 5, 1903, the objects of the invention being to simplify and improve the construction of the apparatus and to provide means whereby the apparatus may be utilized with a downwardly directed or inverted mantle burner, although features of the invention may be utilized in any lamp of this general character.

Referring to the accompanying drawings—Figure 1 is a sectional view in a vertical plane and with parts in elevation, of a lamp embodying the present improvements; Fig. 2 is a section in a horizontal plane indicated by the line 2—2 of Fig. 1, looking downwardly, and Fig. 3 is a sectional plan showing the seat for the portion of the air pipe which constitutes a casing for the gas pipe and also the separate regulating devices for the gas, air and by-pass passages.

Like letters of reference indicate the same parts in all the figures.

The preheating chamber of the present lamp is preferably in the form of a casting A having at one side a bay a in the upper end of which is a gas and air injector. The injector is conveniently formed by an aperture or passage a', leading from the gas inlet passage a^2 into the bay a of the preheating chamber and a tapered nozzle B formed as the end of a screw threaded portion B′ of the air inlet or supply pipe B_2 extending upwardly from the top of the preheating chamber. The supply is thus located at one side of the center of the preheating chamber.

From the center or upper portion of the gas inlet a^2 there extends a gas supply pipe C having a collar c and a threaded upper end c'. The threaded upper end of the gas supply pipe is adapted to screw into a fitting D provided with two laterally extending branches, one branch d opens into the gas supply above a gas regulator D′ for supplying gas to a pilot light, to be presently described, and the other branch d' forms a portion of the air supply passage. The transverse branch d' is provided with a downwardly extending nipple d^2, adapted to register with the upper end of the air supply pipe B^2 and, in order to form a joint between the nipple and end of the air supply pipe, a sliding sleeve d^3 is provided which, when at the lower extreme of its movement bridges the joint and prevents the escape of air. With this construction it is a comparatively simple matter to raise the sleeve d^3 and unscrew the lamp from the fitting d, should it be necessary to take the lamp down for alteration or repair.

Inasmuch as lamps of this character are usually suspended from an overhead support, it is desirable to provide a construction with which the suspending means may consist of a single pipe connection and in the present construction this result is accomplished by extending the gas pipe C′ upwardly from within the fitting D at a point below the lateral branch d' and attaching its upper end to a gas supply fitting E. The fitting E has a lateral branch e forming an air supply passage and the proximate faces of the fittings D and E are formed with seats f for the ends of a casing F. The casing F is of sufficient diameter to leave a passageway around the gas pipe C′, thereby providing concentric gas and air passages which, at opposite ends of the casing, branch into separate supply pipes.

The burner pipe by which the mixed gas and air is conducted from the preheating

chamber A to the burner, preferably screws into the bottom of the preheating chamber and is provided with an extension *g* projecting up into the preheating chamber to a point near the top of the latter. The lower end of said burner pipe G is provided with a foraminous plug or tip H and preferably with an external bead *h* around which the upper end of the inverted mantle burner I is adapted to be secured. The foraminous body H is preferably made of lava or other non-conducting and non-inflammable material and it may be supplemented by a screen H′ of wire mesh located either close to the foraminous plug H or at any suitable point above the same within the burner pipe G.

An inclosing shell K surrounds the preheating chamber, said shell being preferably contracted in proximity to said chamber, whereby the products of combustion from the burner are caused to pass around the chamber to thereby thoroughly heat the same, and in order to still further conserve the heat from the waste products of combustion, as well as to position the shell with relation to the lamp, radial pins K project from the lamp and are adapted to contact with the inner face of the shell, as will be readily understood from inspection of Fig. 2. The shell itself is supported by hangers K′ depending from a ring *k′* mounted on the gas supply pipe C above the shoulder *c* and the cover L for the shell is also supported on a sleeve *l* located above the ring *k′*.

A pilot light tube M extends down from the branch *d* of the fitting D, to a point in proximity to the burner I and is provided with a small burner tip *i*. The amount of gas flowing to the pilot light is regulated by a set-screw *m* in the fitting D in the well understood manner. A coupling M′ serves to connect the tube M and fitting so that these parts may be readily detached when the lamp is to be taken down.

For regulating the air supply a set screw or plug cock N is mounted in the branch *d′* of the fitting D, as shown in Fig. 1.

In operation, air is supplied through the air supply pipe at a somewhat greater pressure than the gas pressure and by the operation of the injector the air and gas are injected into the bay *a* of the preheating chamber at one side of the burner pipe. Inasmuch as the burner pipe has its entrance aperture near the top of the preheating chamber, the gas and air will be thoroughly commingled and heated before its exit from the chamber. Furthermore, the burner pipe in this arrangement takes its supply from the top or hottest part of the body of gas and air within the chamber and conducts the same down through the heated portion of the burner pipe to the burner. The burner pipe, it will be noted, is of large capacity and is practically unobstructed except for the foraminous body adjacent the burner, while the gas supply pipe or passage is very much contracted at the injector and, as a result, the danger of an internal explosion is eliminated for, even should the foraminous body be broken the combined gases and air can only ignite in the preheating chamber and the resultant expansion would find a ready exit through the relatively large burner pipe. No damage could be done by such an explosion further than the destruction of the mantle and all danger of an ignition or an explosion in the gas supply pipe is eliminated.

The construction of the lamp is simple, and, being practically entirely automatic in its action, it is well adapted for use in any and all situations where a suspended light is desired. The intensity of the light is greatly increased by the effective and correct commingling of the gas and air and the heating of the same before it is supplied to the burner.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a light producing apparatus, the combination of a preheating chamber, an injector supplying air and gas under pressure to said chamber, a pipe having a downwardly directed discharge opening and having its entrance opening in said chamber near the top of the latter, and an inverted mantle burner located below the chamber to heat the latter and receiving the mixed gas and air from the downwardly directed discharge opening of the pipe.

2. In a light producing apparatus, the combination of a preheating chamber, an injector supplying air and gas to said chamber, a pipe having its entrance opening in said chamber and a downwardly directed discharge opening, a foraminous body in said pipe near its downwardly directed discharge opening, and an inverted mantle burner depending from the discharge end of said pipe.

3. In a light producing apparatus, the combination of a preheating chamber, an injector supplying air and gas to said chamber, a pipe passing through the bottom of said chamber and having its entrance opening near the top of the chamber, said pipe having a downwardly directed discharge opening below the chamber, and an inverted mantle burner depending from the discharge end of said pipe.

4. In a light producing apparatus, the combination of a preheating chamber, a downwardly extending burner pipe for carrying combustible to a burner carried by the lower end of the burner pipe below the chamber, a gas pipe projecting upwardly from said chamber and having a screw threaded coupling therein, an injector by

which gas and air is forced into the chamber, an air pipe leading to said injector and a sliding sleeve coupling in said air pipe whereby the lamp may be readily detached from the air and gas pipes.

5. In a light producing apparatus, the combination of a preheating chamber, a gas and air injector located at the top and at one side of said chamber for directing commingled gas and air downwardly in the chamber, a downwardly extending burner pipe having its upper end projecting through the bottom wall of the chamber and at one side of the injector and extended to a point near the top of the chamber, said burner pipe being of greater capacity than the air and gas inlets in the injector, and a burner mounted on the lower end of said burner pipe below said chamber whereby the chamber is heated by the waste products of combustion from said burner.

6. In a light producing apparatus, the combination of a preheating chamber, a downwardly extending burner pipe leading from said chamber, a burner carried by said pipe below the chamber, a gas and air injector discharging into the chamber, separate gas and air supply pipes leading to said injector, a fitting to which said gas pipe is connected having lateral branches, one of said branches being provided with a nipple for registering with the air supply pipe, and a pilot light supply pipe connected with the other branch, substantially as described.

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Witnesses:
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GEO. L. BARNES.