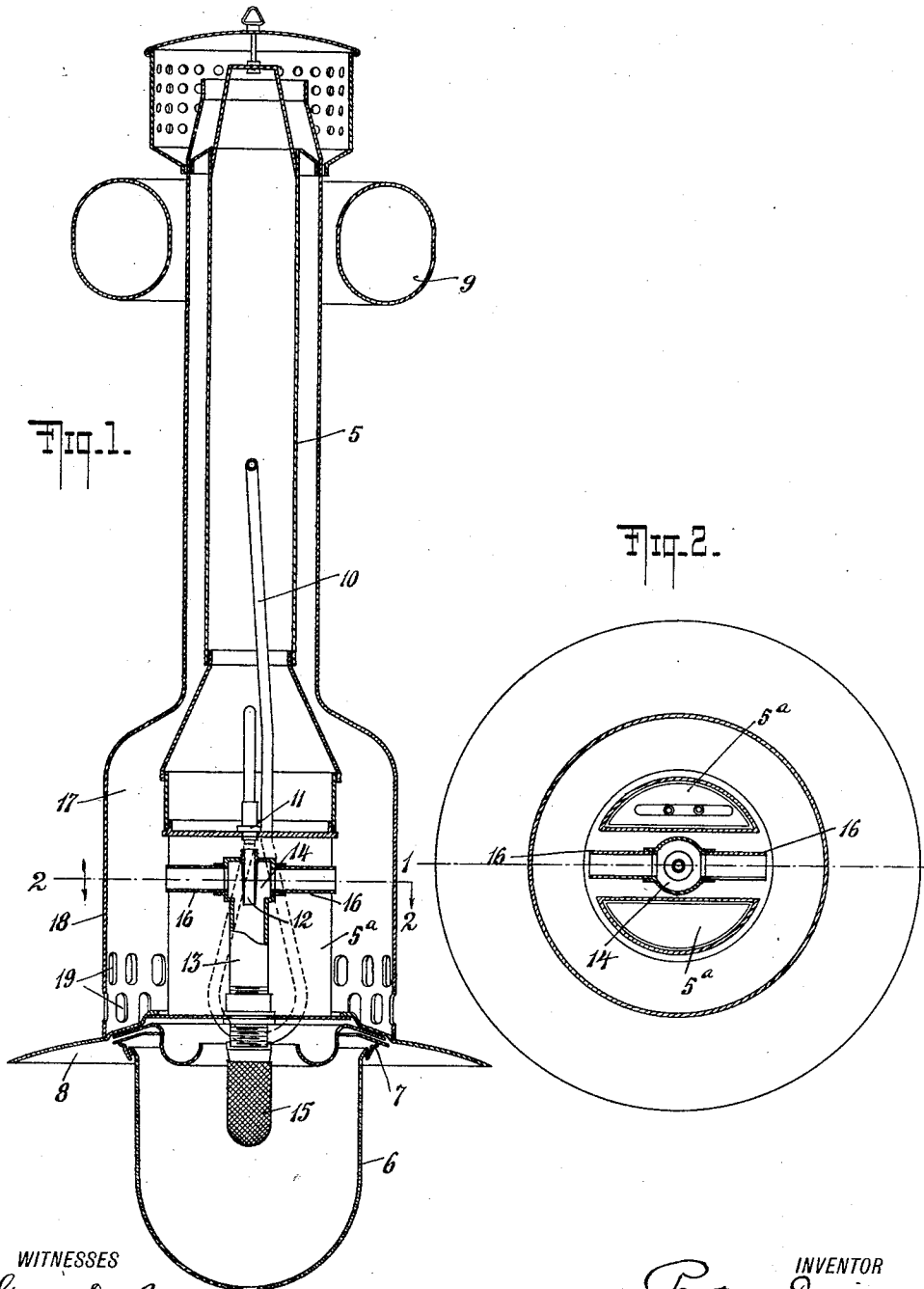


P. DAVIES.
INVERTED INCANDESCENT LAMP.
APPLICATION FILED OCT. 16, 1913.

1,105,259.

Patented July 28, 1914.



WITNESSES
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PRESTON DAVIES, OF LONDON, ENGLAND, ASSIGNOR TO DEUTSCHE GASGLÜHLICHT AKTIENGESELLSCHAFT (AUERGESELLSCHAFT), OF BERLIN, GERMANY, A CORPORATION OF GERMANY.

INVERTED INCANDESCENT LAMP.

1,105,259.

Specification of Letters Patent.

Patented July 28, 1914.

Application filed October 16, 1913. Serial No. 795,479.

To all whom it may concern:

Be it known that I, PRESTON DAVIES, a subject of the King of Great Britain, and a resident of London, England, have invented certain new and useful Improvements in Inverted Incandescent Lamps, of which the following is a specification.

My invention relates to inverted incandescent lamps utilizing either gas or vaporized petroleum or the like as a fuel and has for its object to construct lamps of this description in a simple manner to insure a proper mixture of air and fuel whereby perfect combustion of the fuel and a maximum illuminating effect is attained. In attempting to secure this result it has heretofore been attempted to improve the Bunsen burner by inserting a relatively small tube into the mixing tube so that an annular space is formed about said small tube, the fuel from the usual nozzle first passing into the latter. The intended operation of this arrangement is to have the mixture of air and fuel formed in said inserted tube, gather up additional air by suction from the surrounding portion of the mixing tube, as it passes from the said inserted tube. The intended result, however, is not attained with such construction as the resulting division of the energy available in the stream of gas and air must be accompanied with a loss of energy at the second suction point so that the air introduced by suction is not increased as intended.

In cases where only low gas pressure is available and the aid of a higher gas pressure cannot be invoked to increase the speed of the mixture it has been attempted to augment the volume of air sucked into the mixing tube by increasing the length of the chimney and thus increasing the suction action in said mixing tube. This however necessitates a corresponding increase in the cross-section of the mixing tube immediately adjacent the nozzle in order that the necessary increased amount of air may be supplied by the increased suction. On the other hand, it is necessary to have a mixing tube of fixed or certain cross-section with a given nozzle, or with an air and fuel stream of given cross-section in order to secure a proper injector action in said stream. It will thus be seen that the increase in the cross-section of the mixing tube necessary to

properly utilize the increased suction induced by the lengthened chimney will disadvantageously disturb the injector action of said stream of fuel which flows from said nozzle.

Having knowledge of these facts the present invention seeks to overcome these objections and with this in view accordingly maintains the fixed cross-section of that part of the mixing tube which lies adjacent to the nozzle and which is required to insure a proper injector action in the stream of fuel and arranges an additional chamber about said mixing tube. This chamber is connected with the atmosphere and serves to supply additional air for mixing purposes by the suction of the chimney. In this manner the suction of the chimney and the injector action of the stream of fuel are prevented from interfering with or disturbing each other and both sources of energy are utilized in their fullest strength.

Reference is to be had to the accompanying drawings which by way of example illustrate my improvement applied to a petroleum incandescent lamp and in which—

Figure 1 is a longitudinal section on the line 1—1 of Fig. 2 and Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

In the drawings 5 is a chimney which at its lower end is divided into two separate tubes 5^a each of which communicates with the interior of the globe 6 supported on a suitable frame 7 in any well known manner, the customary shade 8 being provided and carried by the lamp in any desired way. A container or receptacle 9 for the fuel is located near the upper end of the chimney 5 and is connected by means of a tube 10 with the nozzle 11, the tube 10 for a part of its length, at least, being located within the chimney 5 and tubes 5^a in the path of the products of combustion. The nozzle 11 is secured in the lower closed end of the chimney 5 between the ends of the tubes 5^a and has its delivery end spaced from and preferably in axial alinement with an injector tube 12 projecting into the mixing tube 13 and of less diameter than the latter so as to form therewith an annular space 14. The lower end of the said mixing tube 13 extends into the globe 6 and carries the customary mantle 15 as clearly shown in Fig. 1. Transverse tubes 16 extend from the interior of the mix-

ing tube 13 in opposite directions at points opposite the injector tube 12 and communicate at their outer ends with an annular chamber 17 formed between the chimney 5, tubes 5^a and a second chimney 18 which surrounds said chimney 5 and tubes 5^a. The said second chimney 18 is closed at the top and is further provided with air inlet openings 19 at its lower end portion and may be secured in position in any convenient way. In this manner the tubes 16 are in communication with the atmosphere.

In operation the fluid fuel flows, under hydrostatic pressure from the container 9 through the tube 10 in which the vaporization of said fuel takes place under the influence of the combustion gases rising through the tubes 5^a and chimney 5. The gaseous or vaporized fuel streams or flows from the nozzle 11 connected with said tube 10 into the injector tube 12 and becomes mixed therein with the air which is sucked into said tube 12. The suction induced by the chimney 5 and tubes 5^a draws additional air through the transverse tubes 16 from the annular space 17 into the space 14 and interior of the mixing tube 13. The air supply in the space 17 is continually renewed through the air inlets 19. This additional air is added to the mixture of air and fuel which passes from the injector tube 14 to the mixing tube 13 and becomes mixed therewith before the incandescent mantle 15 is reached. In this manner it is possible to secure a highly effective Bunsen flame even when using vaporized petroleum as a fuel which latter requires a large amount of air for combustion purposes and which otherwise, under low pressure, does not receive, by suction of the injector action, the amount of air necessary to secure complete combustion and the intensity of flame required for illuminating purposes.

It is, of course, to be understood that the invention is not limited to the form illustrated and instead of being used in connection with vaporized petroleum, may also be used in connection with other gases or vapors rich in hydrocarbons. Furthermore the present improvement may readily be used satisfactorily in connection with fuel of poorer quality, such as ordinary illuminating gas, and when used will always insure, even with low gas pressure, a mixture of air and fuel of the required richness in air in the mixing tube, before the flame is reached.

Various changes in the form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. An inverted incandescent gas or vapor

lamp comprising a chimney for the escape of the combustion products and adapted to produce suction, said chimney being divided at its lower end into two separate chimney tubes, a globe located below said chimney tubes and substantially closed for preventing the entrance of secondary air, a mixing tube located between said two chimney tubes and extending into the globe, said mixing tube being provided with openings for supplying air thereto by means of the suction of the chimney, an incandescent mantle carried by said mixing tube, an injector tube at the upper end of the mixing tube and of less diameter than the latter, and a nozzle adapted to deliver a mixture of air and gaseous or vaporized fuel to said injector tube.

2. An inverted incandescent gas or vapor lamp comprising a chimney for the escape of the combustion products and adapted to produce suction, said chimney being divided at its lower end into two separate chimney tubes, a globe located below said chimney tubes and substantially closed for preventing the entrance of secondary air, a mixing tube located between said two chimney tubes and extending into the globe, said mixing tube being provided with openings for supplying air thereto by means of the suction of the chimney, an incandescent mantle carried by said mixing tube, a chamber surrounding said mixing tube and connected with the outer air, an injector tube at the upper end of the mixing tube and of less diameter than the latter, and a nozzle adapted to deliver a mixture of air and gaseous or vaporized fuel to said injector tube.

3. An inverted incandescent gas or vapor lamp comprising a chimney for the escape of the combustion products and adapted to produce suction, said chimney being divided at its lower end into two separate chimney tubes, a globe located below said chimney tubes and substantially closed for preventing the entrance of secondary air, a mixing tube located between said two chimney tubes and extending into the globe, an incandescent mantle carried by said mixing tube, transverse tubes located between the chimney tubes and connected with the mixing tube and with the atmosphere, an injector tube at the upper end of the mixing tube and of less diameter than the latter, and a nozzle adapted to deliver a mixture of air and gaseous or vaporized fuel to said injector tube.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PRESTON DAVIES.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.