A. D. JONES.

ELECTRIC ARC LAMP.

APPLICATION FILED JUNE 30, 1911.

1,047,235. Patented Dec. 17, 1912.

Fig. 1.

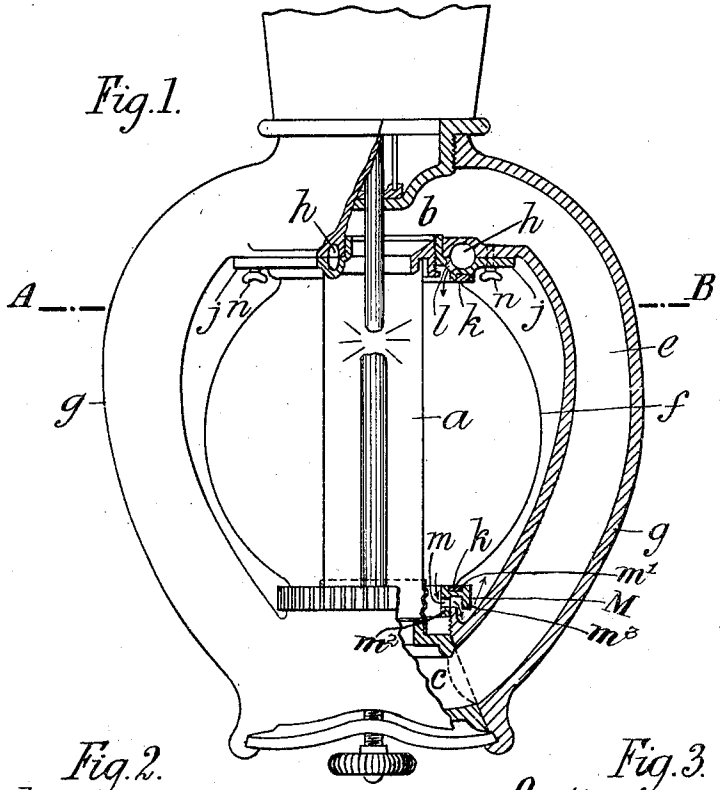


Fig. 2.

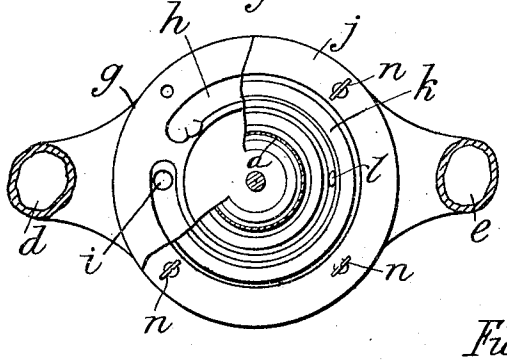


Fig. 3.

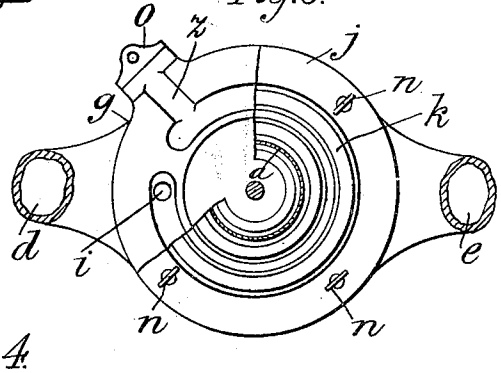
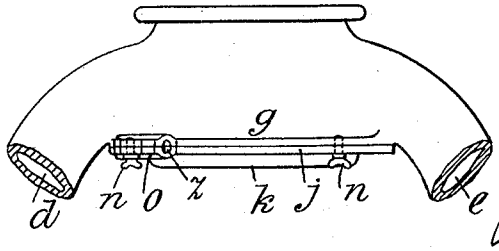


Fig. 4.



Witnesses

C. D. Franzoni

M. E. Burrell

Inventor

Adrian D. Jones.

By his Attorneys

Baldwin & Wright

UNITED STATES PATENT OFFICE.

ADRIAN DENMAN JONES, OF HOLLOWAY, LONDON, ENGLAND.

ELECTRIC-ARC LAMP.

1,047,235. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed June 30, 1911. Serial No. 636,273.

To all whom it may concern:

Be it known that I, ADRIAN DENMAN JONES, a subject of the King of Great Britain, residing at Hartham Works, Hartham Road, Holloway, London, England, have invented new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to improvements in electric arc lamps of the inclosed type burning chemically compounded or mineralized carbons, and it is more particularly applicable to lamps as described in my U. S. Patent No. 935,518 of September 28, 1909.

In inclosed arc lamps burning chemical or mineralized carbons, the expelled gases carry a large amount of chemical fumes which are deposited outside the arc-inclosure; to insure the continued and reliable action of the arc lamp mechanism it is important that none of the chemical fumes should be allowed to reach the mechanism chamber. It is necessary on account of mechanical difficulties, such as the variation of the size of the electrodes, to allow a certain amount of clearance between the upper electrodes or carbons or their guide rods, and the apertures through which the carbons or guide rods pass from the mechanism chamber to the arc inclosure, and there is a tendency, unless proper means are provided in the lamp, for an appreciable amount of breathing action to take place through the aforesaid apertures, thus introducing fumes into the mechanism chamber.

I am aware that breathing arrangements or gas checks have been previously applied to inclosed arc lamps burning pure carbons, these breathing arrangements usually consisting of long narrow passages opening into the outer atmosphere or small closed chambers and sometimes provided with non-return valves. I find that when using inclosed lamps burning chemically compounded or mineralized carbons and having a circulating arrangement for the heavily fume-laden gaseous contents, that the breathing tubes or apertures, as at present used rapidly condense the fumes, the apertures therefor become choked and the breathing device is rendered inoperative. In order to overcome this difficulty I use a breathing aperture of comparatively large section.

When a breathing device of this description is used, difficulties will arise, when exposed to high winds or currents of air, the comparatively large aperture of the tube allowing sufficient fresh air to enter the arc inclosure to rapidly consume the carbons; also it will be seen that if the aperture was directly facing the wind an excessive pressure would be set up in the arc inclosure, and also tending to force the fumes from the arc inclosure into the mechanism chamber and accentuating instead of remedying the evil. To eliminate this action of winds or drafts I may have recourse to one of the following constructions:

The end of the tube or channel is protected where it opens to the atmosphere by a device which will prevent this wind action. Such devices for protecting a tube or flue from wind action are well known in connection with stove or furnace chimneys, and any such efficient device may be applied on a suitably reduced scale. For instance the tube or channel may terminate in a short tube or channel at right angles to it; but it is to be understood that I do not confine myself to this or any particular form.

By another method, applicable only to such lamps as are double inclosed, I so arrange the breathing tube that instead of opening direct to the atmosphere it opens into the space between the inner and the outer globe, the outer globe thus protecting the tube from wind action. It is then necessary that the outer globe communicate with the atmosphere by suitable openings preferably at the bottom.

In order that my invention may be more completely understood, reference may be had to the accompanying drawings.

Figure 1 shows a part section of a lamp. Fig. 2 is an upward view from the section A B Fig. 1. Fig. 3 is a similar view of a modification and Fig. 4 is an elevation of the same.

a is a transparent or translucent chamber in which the electrodes are disposed and which communicates at each end with draft chambers *b* and *c* formed in the top and bottom portions of the lamp casing. Passages *d* and *e* interconnect the chambers *b c* and a globe *f* surrounds the chamber *a*. At the top of the lamp inclosure *g* is an annular groove or channel *h* having an opening *i* communicating with the chamber *b*. The channel *h* is closed by a cover *j* the globe *f* resting on a ring of asbestos *k*.

In the cover *j* is an opening *l* leading into the globe *f* which is held in position by the cover *j*.

The globe *f* is connected at its upper end in any suitable way to the upper part of the lamp inclosure. At its lower end the globe rests on a ring of asbestos *k* carried by a metallic ring M supported on the lower part of the lamp inclosure. This ring, as shown, has an upper part *m'* having a groove to receive the asbestos ring *k*, an inner flange m^2 and an outer flange m^3. The inner flange is provided with a number of openings *m* connecting the interior of the globe with the outer atmosphere in the manner shown in Fig. 1. The flange m^3 projects across the plane of the openings *m* so that gases passing from the globe will follow a sinuous course in the manner indicated by the arrows. The flange m^3 thus protects or shields the outlet openings *m*. Any communication between the outside and the arc chamber *a* is through the draft chamber *b*, the opening *i*, the tube or channel *h*, the opening *l*, the globe *f* and the holes *m*. The hot gases expelled from the arc inclosure will by reason of their smaller density tend to remain at the top of the lamp. In practice in a very strong wind a limited amount of air will be blown through the holes *m* on one side and out through the holes on the opposite side but the pressure in the outer globe cannot be raised sufficiently to force fumes into the mechanism, and any circulation of wind within the outer globe will take place substantially at the bottom of the globe not affecting the stratum of hot gases at the top of the globe. The lamp is made as air-tight as possible. The hole through which the upper carbon passes from the mechanism to the arc chamber is made as closely fitting as is consistent with freedom in work. The variation in pressure on the contained gases is kept within small limits by the provision of a large breathing aperture so shielded that the aperture cannot be exposed to the full force of a gale of wind.

In Figs. 3 and 4 the opening *z* is in communication with the atmosphere through a wind screen *o* instead of through the space between the globes. The wind screen *o* is formed by casting corresponding projections or lugs on the inclosure *g* and the cover *j* which is held in place by wing nuts *n* enabling its ready removal and easy cleaning of the channel *h* and the wind screen *o*.

What I claim is:—

In an electric arc lamp for burning mineralized carbons, the combination with an arc-inclosing chamber, of draft chambers above and below the arc-inclosing chamber and communicating therewith, a conduit outside the arc-inclosing chamber connecting the upper and lower draft chambers through which the arc gases pass and in which deposit takes place, a lamp casing having an opening through which the upper carbon is fed and which is approximately filled by said carbon, a breathing passage having an inlet connected with the upper draft chamber and an outlet opening, means for connecting the outlet opening with the outer atmosphere, and a wind shield at the exit end of the connection for preventing rise of pressure in the draft chambers due to the rise of atmospheric pressure outside the lamp, said breathing passage and its inlet and outlet openings being constructed to afford less resistance to the passage outward of the arc gases than the relatively small opening in the lamp casing surrounding the upper carbon.

ADRIAN DENMAN JONES.

Witnesses:
JOHN H. WHITEHEAD,
H. D. JAMESON.