S. O. COWPER-COLES.

LAMP.

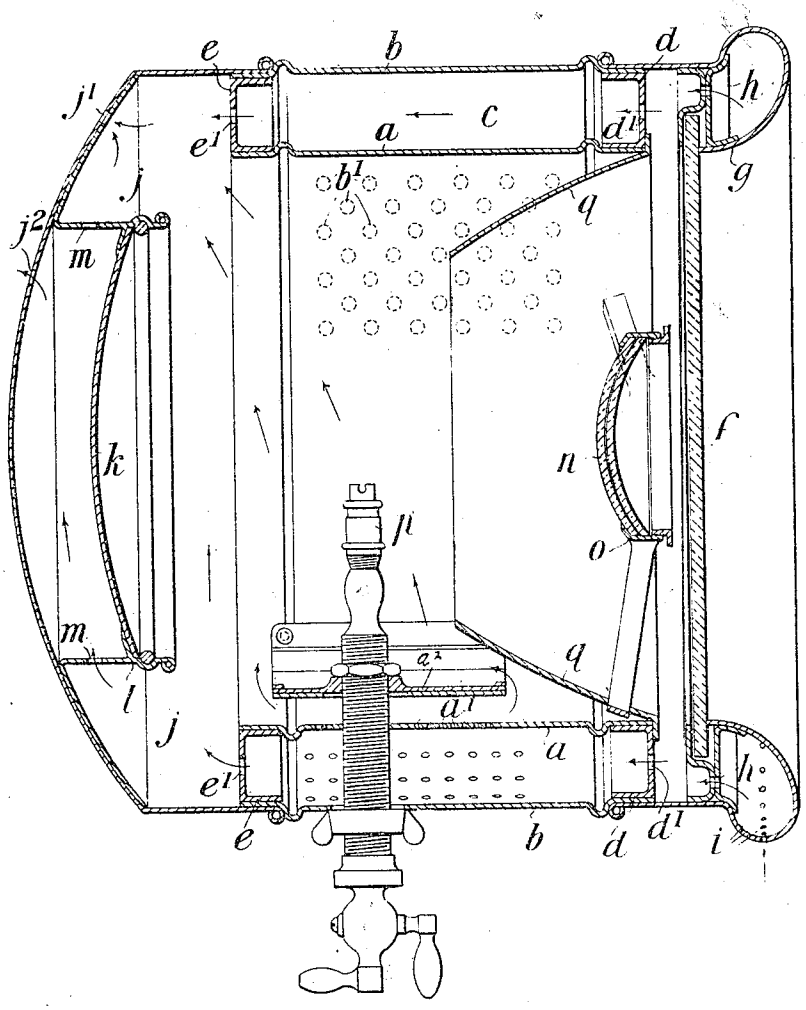
APPLICATION FILED JUNE 4, 1910.

1,007,070.

Patented Oct. 31, 1911.

2 SHEETS-SHEET 1.

Fig. 1.



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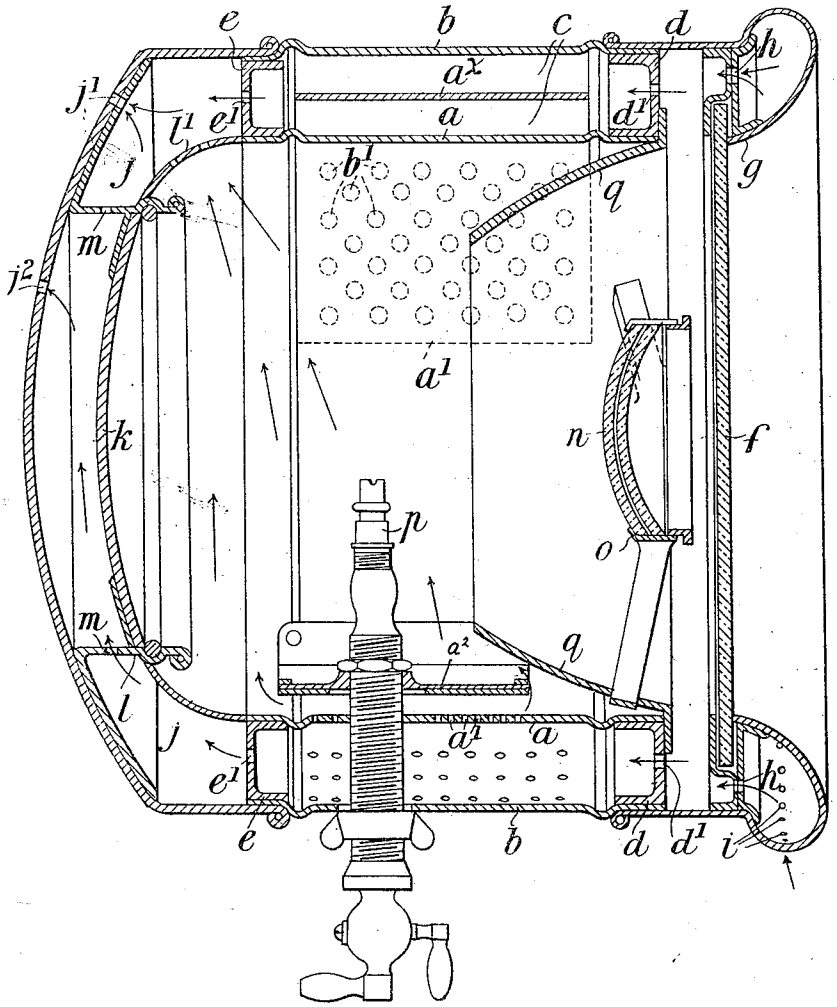
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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LAMP.

1,007,070. Specification of Letters Patent. Patented Oct. 31, 1911.

Application filed June 4, 1910. Serial No. 564,953.

To all whom it may concern:

Be it known that I, SHERARD OSBORN COWPER-COLES, a subject of the King of Great Britain, residing at Grosvenor Mansions, 82 Victoria street, Westminster, London, England, electrometallurgist, have invented new and useful Improvements in and Connected with Lamps, of which the following is a specification.

My invention relates to the construction of lamps and particularly to lamps designed for use as head-lights for motor road vehicles, although my said improvements are also applicable to lamps designed for other uses.

The main objects of my invention are firstly to provide for the projection of a non-dazzling beam of light and secondly to dispense with the usual unsightly ventilating cowl or hood and to secure a more rapid ventilation.

According to the invention I arrange a small lens or mirror in front of the source of light and in such a position as to refract or reflect those rays of light which would normally not be projected on to the mirror, a portion of such light, in the case of a lens, being at the same time transmitted directly.

The lens or mirror may be coated with gold for instance by the process described in the specification of my British Patent No. 2396 of 1909 in which event the lens would permit of the transmission of a certain percentage of the light thrown on to it as green light, thereby considerably reducing the dazzling effect of the beam projected from the lamp and at the same time increasing the total amount of light projected. Or, the mirror or lens may be silver coated, so as to project a white light on to the main reflector and transmit a purple colored light. The lens may be designed to throw either parallel or divergent beams of light.

The main reflector of the lamp may be of glass or metal coated with gold or a gold colored alloy or it may be formed of a gold colored alloy consisting, for example, of copper and aluminium with a small quantity of tin. Or, the reflector may be of silver or silver alloy or coated with silver or an alloy of silver.

In some cases the aforementioned lens or mirror may be encircled by a conical metallic or glass reflecting ring which may be flat or curved and which is coated with gold or silver or other suitable yellow or white metal or a combination thereof on its inner surface.

In some cases the body of the lamp may be formed of an inner and an outer shell the front protective glass being mounted in a ring which is attached to the extremity of the outer shell and which is formed with a number of holes permitting the passage of air to the annular space between the inner and outer shells. The said annular space at its rear end opens through a number of holes into a chamber containing a reflector which is mounted upon a perforated metal ring attached to the back of the said chamber. Furthermore, the outer and inner shells are provided with a number of holes, the holes in the inner shell being preferably not opposite the holes in the outer shell.

With this construction the current of air which traverses the annular space between the inner and outer shells enters the chamber at the rear thereof and passes through the perforations in the supporting ring of the reflector, that is to say, behind the reflector, which is thereby maintained cool, the said air ultimately discharging through perforations in the back of the reflector chamber. Moreover, the current of air which thus flows through the annular space causes an induced draft which withdraws the hot products of combustion from the burner located within the inner shell.

To enable the invention to be fully understood, I will describe it by reference to the accompanying drawing, in which Figure 1 is a vertical sectional view of one form of a motor head light or lamp having my improvements embodied therein. Fig. 2 is a like view of a modified construction.

a is the inner shell and b the outer shell forming the case or body of the lamp. These two shells are of such relative diameters that an annular space c is left between them, the said annular space being closed at the front end by a ring-shaped plate d and at the rear end by a similar plate e. Each of these plates is provided with a number of holes or perforations d^1 and e^1 respectively. Furthermore, the outer shell b is formed with a number of holes b^1 and the inner shell with a number of holes a^1, the holes b^1 being placed in such a position that they are not opposite the holes a^1.

f is the front protective glass and g is the metal ring in which the said glass is mounted, the said ring g being attached to the

outer extremity of the outer shell *b*. This ring is formed with a series of perforations *h* extending completely around the same and also with some perforations *i* at the lower part thereof. These holes *i* and *h*, in conjunction with the holes d^1 in the ring *d* open communication between the atmosphere and the annular space *c* between the outer and inner shells *a* and *b* of the lamp case. An additional case a^x may be fitted to the top of the lamp as a further guard against draft and leakage of light as shown in Fig. 2.

j is the chamber which is situated at the back of the annular body or case of the lamp, and *k* is the reflector which may be of spherical or parabolic form and which is mounted within the metal supporting ring *l* attached to the back of the chamber *j* and provided with the perforations *m*. The inner case *a* of the lamp may be connected to the edge of the ring *l* as shown at b^1.

n is the small lens or mirror which is mounted in the support *o* in front of the burner *p*, and which projects those rays which would otherwise not be reflected from the mirror *k*.

q is the conoidal metallic or glass reflecting ring, which is here shown of a parabolic shape, which encircles the small lens *n*, this ring being, in the construction illustrated, attached to the outer extremity of the inner shell *a* of the lamp case.

With this construction when the lamp is in use a current of air enters through the holes *i*, *h* and d^1 into the annular space *c* from which it issues through the holes a^1 into the chamber *j* a portion passing up through the perforations *m* into the reflector supporting ring *l* so as to bathe the back of the reflector *k*, the said air ultimately discharging from the lamp case through the perforations j^1 in the chamber *j* and perforations j^2 behind the reflector. Above the holes a^1 is a deflector or deflecting plate a^2 by which the air entering through the holes a^1 is divided, a part being directed against the reflector ring *q* and a part directed back of the burner or source of light, tending to cool the front of the reflector *k*. Furthermore, the current of air which thus passes through the annular lamp body induces a draft of air through the interior of the said body, this induced draft withdrawing the hot products of combustion from the burner *p* to the exterior. The arrows in the figure clearly indicate the courses of the air currents. It will also be understood that the larger portion of the light rays from the burner *p* impinges upon the reflector *k* which directs them outward from the front lamp case. The portion of such rays, however, which do not directly fall upon the reflector *k* are intercepted by the lens *n* and the parabolic ring *q* the said lens permitting a portion of such rays as fall upon it to be transmitted directly and reflecting a further portion back to the reflector *k*. As above explained, therefore, the strength of the beam of light issuing from the lamp is greater than is obtained with lamps hitherto constructed owing to the fact that the direct rays from the burner are intercepted and made use of. Also, in view of the fact that a part of the light is transmitted through the lens *n*, the dazzling effect of the ordinary lamp light is largely mitigated since by selecting the coating of the lens *n*, reflector *q* and reflector *k*, lights may be obtained of the different tones or colors hereinbefore referred to.

In some cases the main reflector and the reflecting ring may have bimetallic reflecting surfaces that is to say, surfaces partly composed of a yellow metal and partly of a white metal, preferably with the yellow metal predominating in the one and the white metal in the other reflector.

Claims.

1. A lamp of the kind described having a reflector in front of the source of light, an opaque reflector in the rear of the source of light, and adapted to concentrate its reflected rays upon the front reflector said front reflector permitting a portion of the rays received by it to pass through it but changing the color of the same.

2. A lamp of the kind described having a reflector in front of the source of light, provided with a convex surface toward said light, and a reflector in rear of the source of light having a concave surface toward the source of light, the rear reflector being opaque but adapted to concentrate the light cast upon it upon the front reflector, said front reflector being adapted to permit a part of the rays cast upon it to pass through it and change the color of the same, substantially as described.

3. In a lamp, the combination with a case or body, of an opaque reflector in rear of the source of light, a translucent reflector in front of the same, and an opaque reflecting ring encircling said front reflector, the said rear reflector and reflecting ring having the operative surfaces of the same formed of a yellow metal, and said front pervious reflector formed of glass thinly coated with a like metal.

4. A lamp having a body or case composed of an outer and inner shell having an air space between them, the said outer shell having openings to admit air to said space, the said inner shell having holes to admit air to the interior of the inner shell, said holes in the inner case being out of alinement with the holes in the outer shell, a reflector in the rear and a reflector ring in the front part of the inner shell and a deflector for directing one part of the air admitted to said inner shell upon one of said reflectors

and another part upon the other, substantially as described.

5. A lamp body or case composed of an outer and an inner shell with an air space between them, holes or openings at the front of the case near the bottom thereof, admitting air to said space at the bottom of the case and an outlet for said air near the top of the case at the rear of the same whereby a current of air is provided through said space, substantially as described.

6. A lamp body or case composed of an outer and an inner shell, with a space between them, and a reflector, the back of which forms a part of the inner wall of said space, holes or openings at the front of said case near the bottom thereof admitting air to said space, and an outlet from said space near the top of the outer shell at the rear of the case, whereby a current of air is provided for cooling the back of said reflector, substantially as described.

7. A lamp, comprising a body consisting of an inner and an outer shell with an annular space between them, the said space communicating at the back with a chamber carrying the reflector and at the front with a ring carrying the protective glass, the outer and inner shells and the reflector support being formed with perforations such that a current of air can enter the lamp case and circulate around the back of the reflector, substantially as hereinbefore described.

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