D. J. O'BRIEN.

LAMP AND REFLECTOR THEREFOR.

APPLICATION FILED NOV. 16, 1903. RENEWED NOV. 20, 1909.

974,090. Patented Oct. 25, 1910.

Fig. 1.

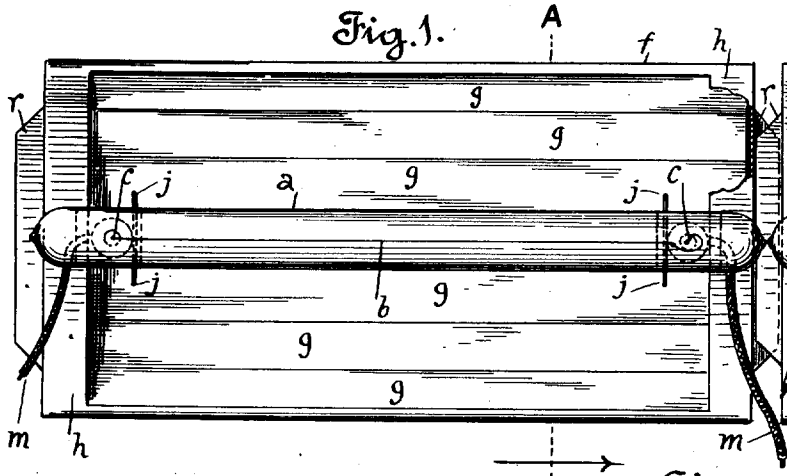


Fig. 2.

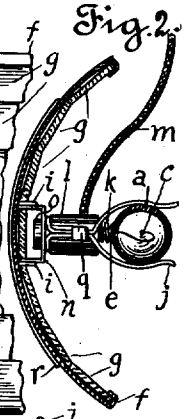


Fig. 3.

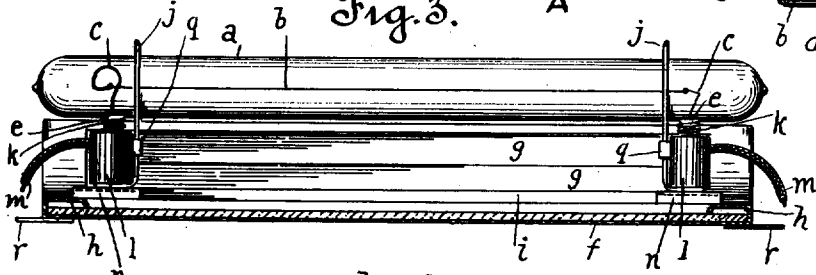


Fig. 4.

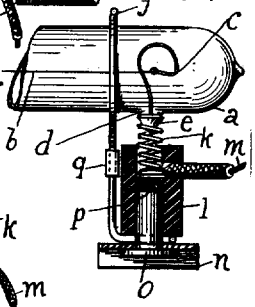


Fig. 5.

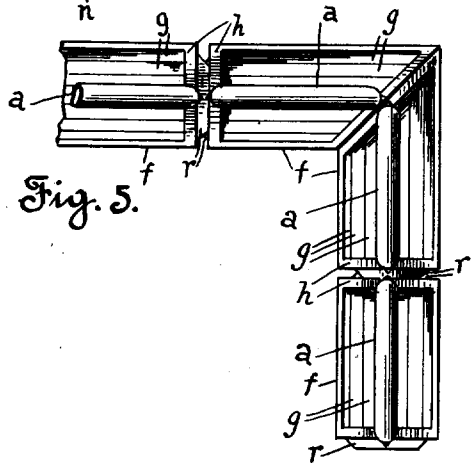
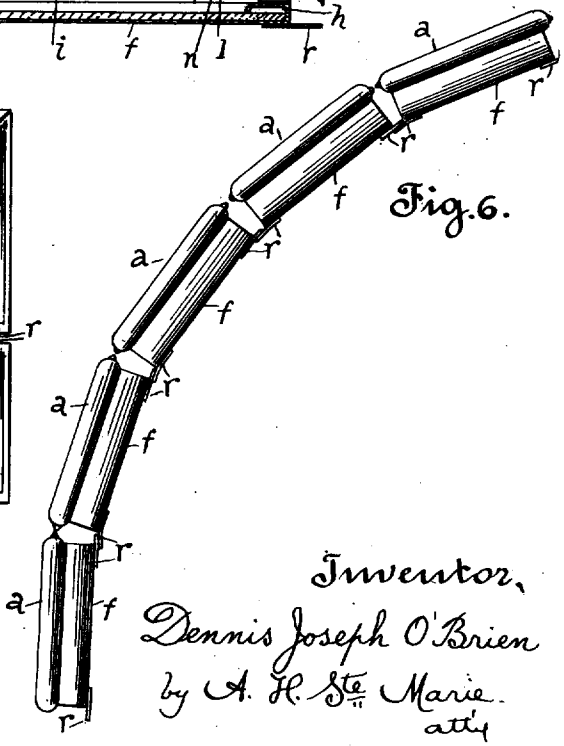


Fig. 6.



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UNITED STATES PATENT OFFICE.

DENNIS JOSEPH O'BRIEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO STRAIGHT FILAMENT LAMP COMPANY, A CORPORATION OF NEW YORK.

LAMP AND REFLECTOR THEREFOR.

974,090. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed November 16, 1903, Serial No. 181,429. Renewed November 20, 1909. Serial No. 529,098.

To all whom it may concern:

Be it known that I, DENNIS JOSEPH O'BRIEN, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented a new and useful Lamp and Reflector Therefor, of which the following is a specification, reference being had therein to the accompanying drawing.

The invention forming the subject-matter hereof relates to tubular lamps, particularly incandescent electric tube-lamps, and to means for producing manifold reflections of the light emitted thereby to the end that the same may be augmented and used to better advantage. It is the offspring of studious observation bearing on the structure and behavior of other types of lamps and reflectors, and as a superior production, is intended to take their place, as well as to supersede in a measure a prior device of mine disclosed in a pending application for Letters Patent of the United States, filed on the 20th day of April 1903, Serial Number 153541 (now Patent No. 744387, granted on the 17th of November 1903).

An important object of the present invention is to provide a suitable reflector for use in combination with electric lamps which derive their current from peripheral contacts and not from the ends, thereby affording the display of a continuous unbroken line of light which would be impossible where lamps having end sockets are employed. Thus the invention admits of two or more lamps being placed end to end to produce a continuous line of light and reflection of the same.

Other objects of minor import will be brought out in the detailed statement of invention hereinafter given.

In the accompanying drawings, Figure 1 is a broken front elevation, illustrative of one embodiment of the invention wherein its constitutive elements, duplicated or multiplied, are seen in juxtaposition endwise and in rectilinear arrangement. Fig. 2 is a cross section on the line A—A of the preceding view, looking to the right, in the direction indicated by the arrow. Fig. 3 shows one lamp in side elevation and a reflector therefor in longitudinal section, adapted to each other in accordance with the invention. Fig. 4 is an enlarged detail view, showing fragmentary portions of the lamp and reflector, and the electrical connections at one end. Figs. 5 and 6 are diagrammatic representations, illustrating the adaptability of the invention to continuous lighting in any desired direction, angularly or circularly as well as in a straight line.

The principal elements of the invention consist of a tubular lamp whose ends and visible surface are wholly uncovered, and a sectional reflector that is open-ended and composed of narrow reflecting surfaces parallel to the lamp and line of light. In the form shown herein, the said lamp comprises a tube *a*, of either clear or frosted glass, which is exhausted of air and sealed to provide the customary vacuum chamber for an incandescent electric light. This tube contains the light-giving agent, preferably a carbon or carbonized filament *b*, stretched in a single line longitudinally of the tube and held centrally therein by yielding supports at the ends, such as spring-anchors *c*. The latter are conveniently made of light platinum wire plated or jointed to the ends of the filament *b* and rising from lateral glands *d* of the tube or lamp body, near the extremities thereof, where they are sealed in and soldered to cone-shaped metallic contact-pieces *e*, exteriorly cemented to and covering said glands. Both contacts *e*, it will be observed, are quite small and located for connection with an electric circuit rearwardly of the lamp, so that ordinarily the said contacts will not be seen. Barring these contacts and the aforementioned anchors, which can be treated as infinitesimal negligible quantities inasmuch as they are not discernible at a distance when the filament is aglow, there is absolutely no obstruction to the passage of the light from said filament through the sides and ends of the lamp tube or body, which therefore becomes luminous throughout and transmits or radiates the light in all directions.

As before stated, the reflector in this invention is open at the ends to permit the end emission or propagation of light of which the filament and inclosing tube are capable as we have just seen, and at the same time the said reflector, in paralleling the lamp by its sections, retains its other characteristic disclosed in the aforesaid patent application (and patent) and consisting in its

faculty of giving multiple images of the line of light in orderly groups. It consists of a segmental casing *f*, which may be made of tin, iron, brass, aluminum, or other suitable sheet-metal, and whose concave surface is divided into reflective parallelograms *g*, somewhat narrower than the tube-lamp and nearly if not quite the same length. These parallelograms may be produced by breaking or creasing the metal of the casing on parallel equidistant lines, as Fig. 5 for instance may suggest, or otherwise they may be strips of mirror, or sections of porcelain or so-called white glass, embedded in said casing, as represented in Figs. 1, 2, and 3. In any case the parallelograms are arranged at very obtuse angles to one another, so that collectively they will form an almost perfect arc of a circle, though individually they slightly project out of the arc, to which they are tangential. When the sheet-metal alone is used, it is burnished on the inside or else nickeled to make it properly lustrous. As to the strips or sections of mirror, white glass or porcelain, they are set closely side by side within the casing where they are confined by turning over the edges of the latter inward and by soldering transverse retaining pieces, as *h*, over them at the ends, which pieces are burned or punched out of sheet-metal and are best seen in Fig. 3. Experience has taught that it is advisable so to inclose the said strips or sections, that they may not be readily removed and no repair of the reflector be attempted save by accredited or competent persons. In some cases it is well also to divide the group of sections into two equal series on each side of the innermost or middle section, or that which is to come directly under the tube-lamp, this being accomplished by inserting two dividing strips *i*, of sheet-metal, between said central section and the sections adjoining it on each side. As seen in Figs. 2 and 3, these dividing strips stand on edge perpendicularly to the casing *f* and are secured by solder to the end pieces *h*. It is understood that they isolate the two series of strips, and if accidentally one be broken and the sections thereof become loose and disarranged, the other being separated therefrom will remain undisturbed and capable of discharging its functions with fairly good results till the reflector can be taken up for repairs.

The above described lamp and reflector are brought and kept together by placing the former between spring clamps *j* at a suitable focusing distance from the parallelograms *g* of the latter, and through said clamps, holding its cone-shaped contacts *e* each within a spiral spring *k*, seated in an insulator *l*, provided at each end of the casing *f*. To the springs *k* are attached the wires *m* of the electric circuit, which wires can be soldered each to its respective spring and passed through and glued in a lateral aperture in the corresponding insulator, after the manner represented in Fig. 4. The insulators *l* may be of fiber, or glass, or porcelain, whichever may be preferred. Each insulator is advantageously made in the shape of a tube, which is held endwise upon a saddle *n*, by a rivet *o*, tightly fitted in its inner end and soldered to said saddle. Two such saddles of course are provided, one for each insulator. These saddles are most easily made of sheet-metal and fastened by solder to the end pieces *h* and dividing strips *i*, over and across the ends of the central section or parallelogram of the reflector. As above intimated, the spiral spring contact *k* occupies the outer end of the tubular insulator in each instance, and it is separated from the rivet *o* at the inner end thereof by an intermediate washer *p*, of insulating material, or else by leaving the insulator-tube unbored between the spring and rivet. The clamps *j* are best made of spring wire looped around the rivets *o* under the insulators *l*, thence closely drawn out at right angles to and from a solder connection with the saddles *n*, doubled and held together by clasps *q* on the inner sides of said insulators, and finally branching outward fork-like above the latter in shape and position to receive and embrace the tube-lamp by its opposite ends laterally, as shown in Figs. 1 to 4. The forks of these clamps are given sufficient resiliency to grasp and securely hold lamps of various diameters, even in an inverted position, and so are the springs *k* in order that they may always reach and remain in touch with the thereto appertaining metallic cones *e* and thereby operate to maintain the lamp electrically in circuit. This construction, it will be noticed, is compact, solid, and economical, and provides for the ready insertion and removal of the lamp and easy cleaning of the reflector.

Where but one reflector and lamp are used, for instance as a desk-light, or for lighting a single object, like a painting or picture, the same may be mounted on, suspended from, or otherwise attached to any convenient fixture, of which there are numerous varieties. When, on the other hand, they are connectedly employed in pairs or series, for example in show-windows and show-cases or generally for purposes of illumination, it is useful to provide each casing *f* with end flanges *r*, which afford a cheap and efficient means of attachment to hold the several reflectors and lamps in their allotted places. A couple of screws passed through a similar number of slots in each flange *r* will then usually suffice to adjust each reflector and lamp and hold them in their adjusted position.

The various figures of the drawing amply suggest how to connect, or group, two or more of the combined reflectors and lamps in order to obtain the best results and increased effects from the available light under different conditions. It will be seen that the invention favors close union endwise of the reflectors and lamps, whether by direct lapping or mitering or curvilinear disposition, and there is preserved in each case that peculiar interrelation of parts which insures full and continuous lighting in the chosen direction, with secreted contacts free from the objectionable features hereinbefore pointed out. It will be further noted that the invention is well adapted for both external and internal lighting, as the reflector can easily be so turned as to either expose or conceal the lamp or source of light. Therefore the lamp may either be used for the light it can show, or it may simply be employed for the illuminating power it affords. In the one case it will attract attention as a light, in a sign or in illumination; in the other case it will better suit the shrewd merchant, who, mindful of the fact that a light exposed will more or less distract from other things, prefers to place it, as far as is practicable, out of sight and use it only to bring into view the goods he has to sell.

Although the reflector has been described and shown as a sectional reflector made up of a number of parallel reflective surfaces, it is not of the essence of the invention that it should be so divided. Usually there will be a plurality of these reflective parallelograms, because, oftener than otherwise, the light is utilized with the intention of getting from it all it can yield, but there are many instances when anything approaching a glare or decided intensity is not desirable and a subdued, moderately powerful, light is preferred. In the latter class of cases the reflector is made with a single reflective surface and only its parallelism with the lamp and line of light is maintained.

No claim will be made herein to the broad idea of having the lamp and reflector so constructed as to secure the aforesaid parallelism between the reflective surfaces and the line of light, since the same is satisfactorily covered in the said application No. 153,541 (Patent No. 744,387). But, without particular restriction to the precise or exact details of construction herein disclosed, nor limitation regarding the specific structure of the lamp or reflector in so far as they can be used separately in other relations, the statement of claim will be principally directed to covering their structural and functional adaptation to each other whereby the one is made to coact with the other and they jointly effect a new, useful, and technological result representing an advance in the art of lighting.

What I claim, and desire to secure by additional Letters Patent of the United States, is:—

1. The combination with a lamp having a casing or bulb translucent throughout, and provided with a filament the conductors of which extend laterally to the length of the lamp, of a reflector, and means for engaging the side of the bulb adjacent to the reflector, said means terminating short of the circumference of the bulb.

2. A reflector having laterally-projecting conductors, and a lamp having laterally-projecting conductors, and means for engaging the side of the lamp adjacent to the reflector and which terminates short of the circumference of the lamp.

3. The combination with a lamp translucent throughout its length and at each end, the lamp being provided with a filament the ends of which extend laterally out through the lamp body, of a reflector, means carried by the end portion of the reflector for removably connecting the end of the filament with a source of electrical energy, and separate resilient means supported by the first named means for clasping the lamp body and which terminates short of the circumference thereof.

4. The combination with a filament lamp translucent throughout its length and at the ends, the same being provided with contacts located laterally of the filament therein, of a reflector open at each end, an insulated support on the reflector located directly beneath the lamp, a yielding contact carried by the support and adapted to engage the lamp contact, and separate means also carried by the support and insulated from the contact for clasping the lamp and which terminates short of the circumference thereof.

5. The combination, in a filament lamp the contacts of which are located laterally of the filament and in alinement with the longitudinal axis of the lamp, of a reflector open at each end, supports carried by the reflector at points beneath and within a space equal to the length of the lamp, contacts carried by the supports and engaging the lamp contacts, and clasping means independent of the contacts, said means carried by and insulated from the supports and embracing the lamp, the contacts and supports being located between the lamp body and the reflector.

6. The combination with a lamp, of a reflector comprising a body portion, a plurality of independent reflecting surfaces mounted on the body portion, and a dividing strip located between the reflecting surfaces for separating the plurality of surfaces and independently supporting the reflector sections.

7. The combination with a tubular lamp, of a reflector comprising a body portion, a

plurality of reflecting surfaces mounted thereon parallel with the lamp, and dividing strips located between the central reflecting surface and the reflecting surfaces on each side thereof and independently supporting the reflector surfaces.

8. The combination with a tubular incandescent electric lamp having lateral terminals, of a reflector, a saddle located on the reflector beneath one of the terminals, a post secured to and projecting above the saddle, an apertured insulating member on the post, a yielding contact received in the aperture of said member and projecting thereout, the contact engaging the lamp terminal opposite.

9. The combination with a tubular incandescent electric lamp having lateral terminals, of a reflector, comprising a body portion, a plurality of reflecting surfaces mounted on the reflector, a saddle located beneath the lamp and straddling one of the reflector surfaces and attaching with the body portion, and an insulated contact supported on the saddle and engaging a lamp terminal, the saddle being flexible laterally with respect to the contact.

10. The combination with a filament lamp having lateral terminals, of a reflector, a saddle supported on the reflector immediately beneath one of the lamp terminals, a post carried by the saddle, an apertured insulator, said post being received in the aperture in the insulator, a yielding contact also received in said aperture, and insulation dividing the contact and post, the contact adapted to engage a lamp terminal.

11. The combination with a filament lamp provided with lateral terminals, of a reflector, a post suitably supported by the reflector and beneath the lamp body, a contact carried by the post and engaging one of the terminals, and a resilient clip encircling the post and extending upward beside the contact, the upper end of the clip being adapted to embrace the lamp body.

12. The combination with a filament lamp having lateral terminals, of a reflector, a suitably supported contact located directly beneath the lamp and adapted to engage one of its terminals, and a resilient clip located adjacent to but separate from the contact, the clip being carried by the reflector and comprising a pair of curved divergent resilient arms adapted to snugly grasp the lamp, and a clasp embracing and slidable on the arms to adjust them.

13. The combination with a tubular filament lamp having lateral terminals, of a reflector, a suitable support carried by the reflector and located directly beneath the lamp and in line with one terminal thereof, an insulator mounted on the support, a contact carried by the insulator and engaging said terminal, a clip mounted on the support, the insulator superposed upon the clip, the clip comprising divergent resilient arms extending upwardly and adapted to grasp the lamp body.

In testimony whereof I affix my signature in presence of two witnesses.

DENNIS JOSEPH O'BRIEN.

Witnesses:
CHAS. DORNBACH,
A. H. STE. MARIE.