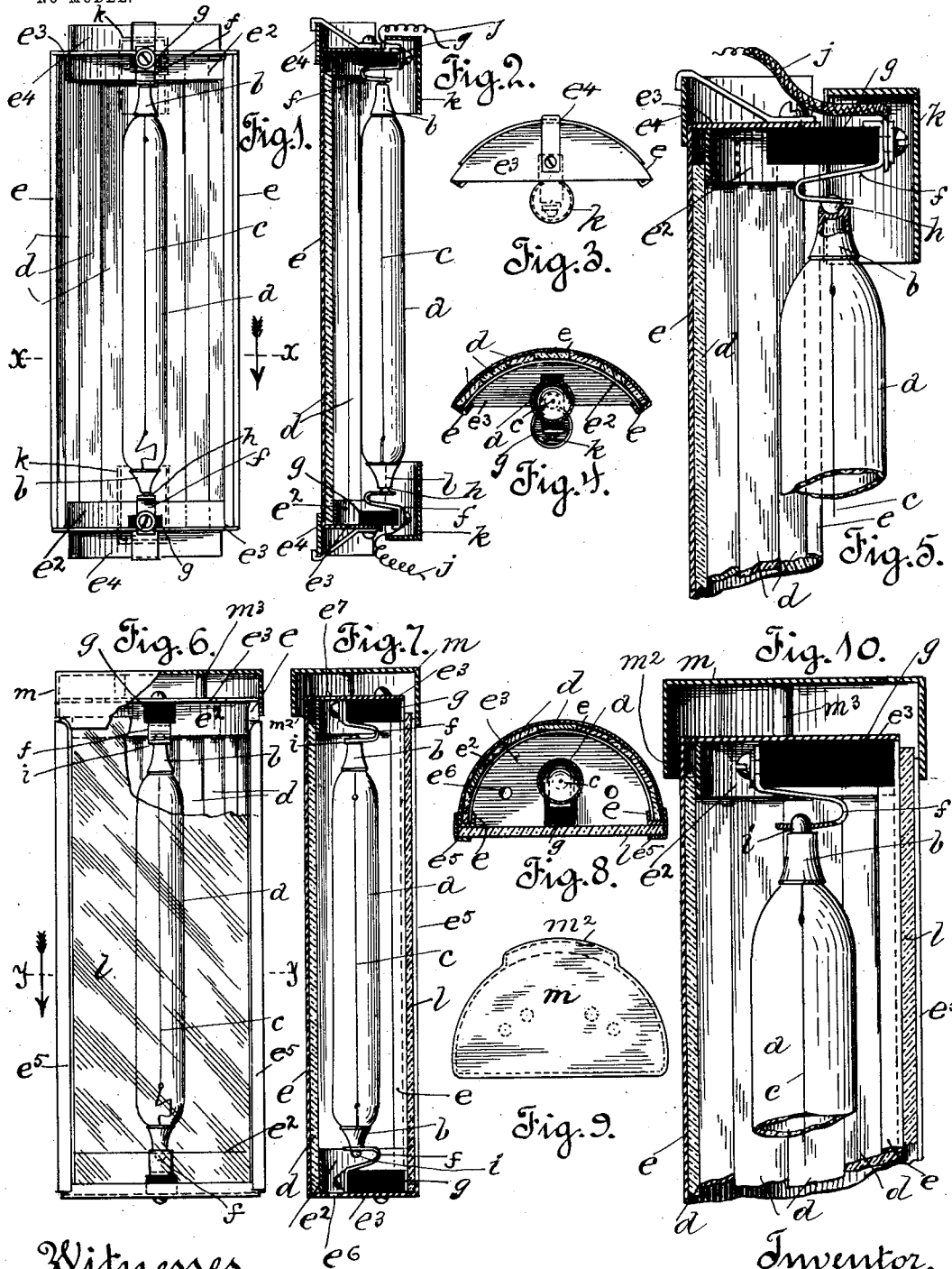


D. J. O'BRIEN.
REFLECTOR.

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NO MODEL.



Witnesses.

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UNITED STATES PATENT OFFICE.

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REFLECTOR.

SPECIFICATION forming part of Letters Patent No. 744,387, dated November 17, 1903.

Application filed April 20, 1903. Serial No. 153,541. (No model.)

To all whom it may concern:

Be it known that I, DENNIS JOSEPH O'BRIEN, a citizen of the United States of America, and a resident of the city and county of San Francisco, in the State of California, have invented a new and useful Reflector, of which the following is a specification.

This invention is devised chiefly for use in connection with an incandescent electric lamp of my own design and make, which properly is the subject-matter for another patent application, and whose principal feature, in so far as it affects the construction of the reflector forming the subject-matter hereof, is that the said lamp has what I shall call a "single-line" or "single-piece" illuminator that may be straight or curved, but is inclosed in a transparent receptacle whose sides are approximately parallel. The reflector is intended to multiply the rays from the lamp in a manner that will produce a greatly-increased effect with the available light without undue generation or radiation of heat, and to do so at a minimum expense.

Reference will be made to the accompanying drawings, which form an integral part hereof, for a detailed description of this improved reflector.

In the said drawings, Figure 1 is a front elevation of the preferred form of the reflector for show-windows, and generally for lighting stores, offices, halls, and the sundry apartments of a building. Fig. 2 is a central sectional elevation of the same. Fig. 3 is a top view of the construction shown in Fig. 1. Fig. 4 is a cross-section on the line xx of the same, Fig. 1, looking down as the arrow points. Fig. 5 is a detail view consisting of an enlargement of the upper part of Fig. 2. Fig. 6 is a partly-broken front elevation of the reflector adapted for use as a headlight. Fig. 7 is a central longitudinal section of the said Fig. 6. Fig. 8 is a sectional plan taken from the line yy of the same, Fig. 6, looking in the direction indicated by the arrow—that is, downward. Fig. 9 is a top view of Fig. 6 unbroken. Fig. 10 is an enlarged view of the upper part of Fig. 7.

Similarly-functioned elements are design-

nated by similar reference signs throughout the specification and drawings.

The body of the lamp for which this improved reflector was principally designed, as above stated, consists of a receptacle a , of transparent glass, that is generally straight and of substantially uniform cross-sectional area throughout its length except at the ends, which are preferably brought each to a point and covered with metal caps or tips b . This receptacle, when properly exhausted and made to inclose a carbon filament, as c , having suitable connections with an electric circuit, forms an incandescent lamp possessed of certain superior qualities that are peculiarly its own. However, the internal construction of the said incandescent lamp is foreign to the present invention, and this is not the place where the details thereof may be given. In outward appearance the lamp-body a , as illustrated, is distinctly tubular, and as all the parts of the lamp are contained therein the entire lamp hereinafter, for the sake of brevity and to more clearly bring out the adaptation of the reflector to the design thereof, will be referred to as a (or the) "tube-lamp."

The reflector proper is composed of a variable number of sections d , which are conveniently and economically made of strips of transparent glass covered on the back with a suitable amalgam. The several sections are plane elongate rectangles somewhat longer than the tube-lamp and having nearly the same width, or more or less. I have obtained excellent results with sections of the relative proportions shown and also with smaller sections. The number of the sections naturally varies with the requirements to be filled or the effect desired to be produced. I have successfully used as few as three and as many as nine. Whatever may be their number the sections are placed edge to edge by the side of one another in a continuous series and disposed in an arc of a circle, thereby producing a sectional reflector that is transversely concave and longitudinally straight. Being plane sections they are tangential to the said arc, as it is preferred they should be.

To hold the above-described reflector-section-

tions *d* functionally together, I use a plain frame or casing *e*, of sheet metal, in which they are loosely set, so that in case of breakage of any one section or if it is required to alter the size of the reflector it can be repaired or added to or taken from in the most convenient manner and with the least expenditure. In other words, the sections are individually replaceable, aggregable, or removable. When they have been set in place, they are kept in their respective positions by turning in the longitudinal edges of the casing *e* and laying narrow strips *e*² of same metal as the casing across their ends, which strips are caught at their respective ends under the said turned-in edges and are curved to conform to the concavity of the reflector, as clearly represented in the drawings. Sheet-metal plates *e*³, cut to fit the arc of the reflector, are also secured across and at right angles to the ends of the casing *e*. These plates not only serve to impart greater rigidity to the casing, but afford, besides, commodious supports for the ends of the tube-lamp and its electrical connections, presently to be described. To better adapt them to the latter purpose, the said plates *e*³ may each have its forward or outer edge braced externally to an extension or flange *e*⁴, provided at the corresponding end of the casing *e*, as suggested in Figs. 1, 2, 3, and 5.

As shown, the tube-lamp is placed directly opposite the central section of the reflector, either partly or wholly inside the arc about which the several reflector-sections are disposed, so that it will stand or lie parallel with the aggregate sections longitudinally in whatsoever position the reflector may occupy. It is a special feature of this invention that the reflector is made to parallel the lamp. If in a given case the latter shall deviate from a straight line, the former may be shaped so as to accommodate it and maintain the parallelism in so far as that can be done without impairing its efficiency; but the lamp being usually straight, the reflector likewise will ordinarily have the form illustrated in the drawings, wherein it appears as a segment of a hollow cylinder, the axial line of which the lamp parallels. To hold the lamp in place, I provide two springs *f f*, one at each end of the reflector, which springs are fastened to insulating-blocks *g g* on the inside of the end plates *e*³ *e*³ of the casing *e* and are arranged to grasp and hold the lamp between them by its tips *b b*. The said springs and lamp-tips are connected to one another by what may be termed a "ball-and-socket joint" in either of the two ways indicated in the drawings—that is to say, as at *h* in Figs. 1, 2, and 5 or as at *i* in Figs. 6, 7, and 10. Electric wires *j* are attached to the springs, one to each, which, it is obvious, place the lamp in circuit as soon as it is grasped thereby.

When the lamp is wholly or partly outside the reflector—for instance, when the reflector

is of slight curvature or short arc, as shown in Figs. 1 to 5—I prefer to cover up its extremities by means of small hoods *k*, which also protect the springs that hold them. These hoods are of paper-lined sheet metal and are held in their respective positions by the insulators *g*, one side of each hood being cut away and the edges of the cut-away portion entering suitable grooves in the sides of the insulators in a manner that will be readily understood by reference to the figures last mentioned.

Usually for indoor service the body of the lamp is not covered otherwise than by the reflector within or in front of which it is suspended; but for use outdoors, as in the case of headlights, &c., it is preferable to inclose it entirely by covering the open face of the reflector with glass, as shown in Figs. 6 to 10, for example. The glass may be plane, prismatic, or lenticular, as preferred. I have shown a plain glass pane *l*, which is held in position by flanges *e*⁵, provided on the sides and at one end of the casing *e*, and by a hood *m*, tightly fitted over the other end of the said casing. When the lamp is thus inclosed, it becomes necessary to provide means of ventilation, and I therefore make holes *e*⁶ *e*⁷ in the two end plates *e*³ of the casing *e* and form the hood *m* so as to have a vent *m*² at its lower edge in the rear of the reflector. The hood *m* is suitably held up or away from the adjacent plate *e*³ by pins or studs *m*³. The two plates *e*³, it will be observed, extend sufficiently over the ends of the lamp to protect them and their connections without the use of the hoods *k*, which are dispensed with when the reflector is closed or the lamp is set deeply in it.

I have described and illustrated my improved reflector aforesaid exclusively in connection with a special form of electric lamp of the incandescent type, because it is particularly adapted for use with that form of lamp. Let it be understood, nevertheless, that my invention is not restricted to such use; but I contemplate using it with any lamp or light to which it is applicable or with which it can be employed. Consequently the right is reserved to all the uses which the invention can be put to, as well as to all the changes and modifications of which it is capable in so far as the same shall come within its scope or embody its principle.

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

1. A sectional reflector the sections whereof are arranged in an arc of a circle and parallel the lamp, ends for the reflector, and springs at the ends for holding the lamp in position, substantially as set forth.

2. A reflector composed of sections that are individually aggregable and removable, ends for the reflector, and springs at the ends for holding the lamp in position, substantially as described.

3. A sectional reflector that is transversely concave and longitudinally straight and is provided with means for holding an electric lamp in circuit, said means also constituting a support for the sections of the reflectors, substantially as described.
4. A sectional reflector comprising a segmental casing, having top and bottom sections, a spring member upon the top section for holding the lamp between the top and bottom sections in parallelism with the several reflector-sections, and means for ventilating the several reflector-sections.
5. A reflector consisting of sections placed edge to edge in an arc of a circle, each section being tangential to said arc, ends for the reflector and springs at both ends for holding the lamp in position, substantially as described.
6. A reflector for a tube-lamp comprising a number of sections running parallel with the lamp, a casing therefor, insulators at the ends of the casing, resilient means secured to the insulator at the upper end of the casing and arranged to engage the lamp for holding the same in parallelism with the several reflectors.
7. A reflector for a single-line illuminator, said reflector being composed of narrow sections paralleling the illuminator, ends for the reflector, and springs at the ends for supporting the illuminator, substantially as described.
8. A reflector for a tube-lamp comprising a series of sections running parallel with the lamp, a casing therefor, and a spring at the top of the casing arranged to engage a metallic cap upon the upper end of the tube-lamp to hold the same in parallelism with the several reflectors.
9. A sectional reflector comprising a segmental casing and springs at the ends thereof adapted to receive and detachably hold a lamp opposite the reflector-sections and in parallelism therewith, substantially as described.
10. A sectional reflector comprising a segmental casing, means for holding a lamp therein in parallelism with the several reflector-sections, a glass cover, and means for ventilating the reflector, substantially as described.
11. A reflector for a tube-lamp comprising a number of sections running parallel with the lamp, a casing therefor, insulators in the ends of said casing, springs secured to said insulators and adapted for engagement with the lamp by ball-and-socket joints, electrical connections, and means for protecting the ends of the lamp and parts thereto connected, substantially as described.
12. A sectional reflector comprising a segmental casing, having top and bottom sections, spring members upon the top and bottom sections for holding a lamp therebetween in parallelism with the several reflector-sections, and means for ventilating the reflector, substantially as described.
13. A reflector for a tube-lamp comprising a number of sections running parallel with the lamp, a casing therefor, insulators at the ends of the casing, and springs secured to said insulators and arranged to engage the lamp for holding the same in parallelism with the several reflectors.
14. A reflector for a tube-lamp comprising a series of sections running parallel with the lamp, a casing therefor, and springs at the top and bottom of the casing arranged to engage metallic caps upon the ends of the tube-lamp to hold the same in parallelism with the several reflectors.
15. A reflector for a tube-lamp comprising a series of sections running parallel with the lamp, a casing therefor, insulators in the ends of the casing, and springs secured to said insulators and arranged to engage metallic caps upon the ends of the tube-lamp to hold the same in parallelism with the several reflectors.
16. A reflector for a tube-lamp comprising a number of sections running parallel with the lamp, a casing therefor, insulators in the ends of said casing, and resilient means secured to said insulators and adapted for engagement with the lamp by ball-and-socket joints.
17. A reflector for tube-lamps comprising a series of sections, a casing therefor, and resilient means in the casing arranged to engage with the lamp by ball-and-socket joints.
18. A sectional reflector comprising a segmental casing, a lamp therein, a glass cover for the casing, means for ventilating the reflector, and a hood on the reflector.
19. A reflector for lamps, comprising a series of sections running parallel with the lamp, a casing therefor, resilient means for holding the lamp in parallelism with the several reflectors, and hoods on the reflector.
20. A reflector for a tube-lamp comprising a series of sections running parallel with the lamp, a casing therefor, insulators in the ends of said casing, springs secured to said insulators and adapted for engagement with the lamp by ball-and-socket joints, and hoods secured to said insulators.
21. A reflector for a tube-lamp comprising a series of sections running parallel with the lamp, a casing therefor, insulators in the ends of said casing, springs secured to said insulators and adapted for engagement with the lamp by ball-and-socket joints, and detachable hoods secured to said insulators.
22. A reflector for tube-lamps comprising a series of sections, a casing therefor, and a spring at the upper end of the casing arranged to engage with the lamp by ball-and-socket joints.

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Witnesses:

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