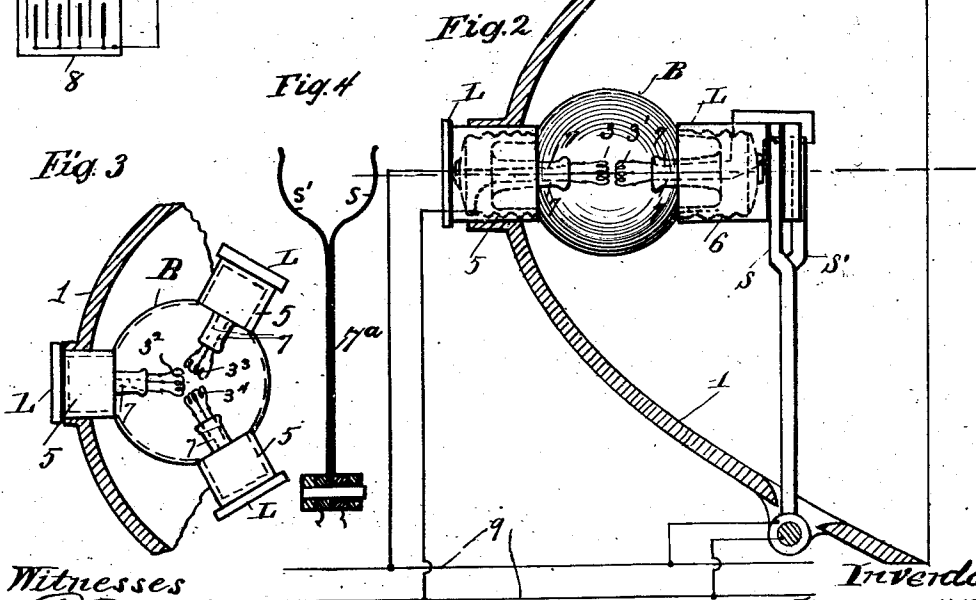
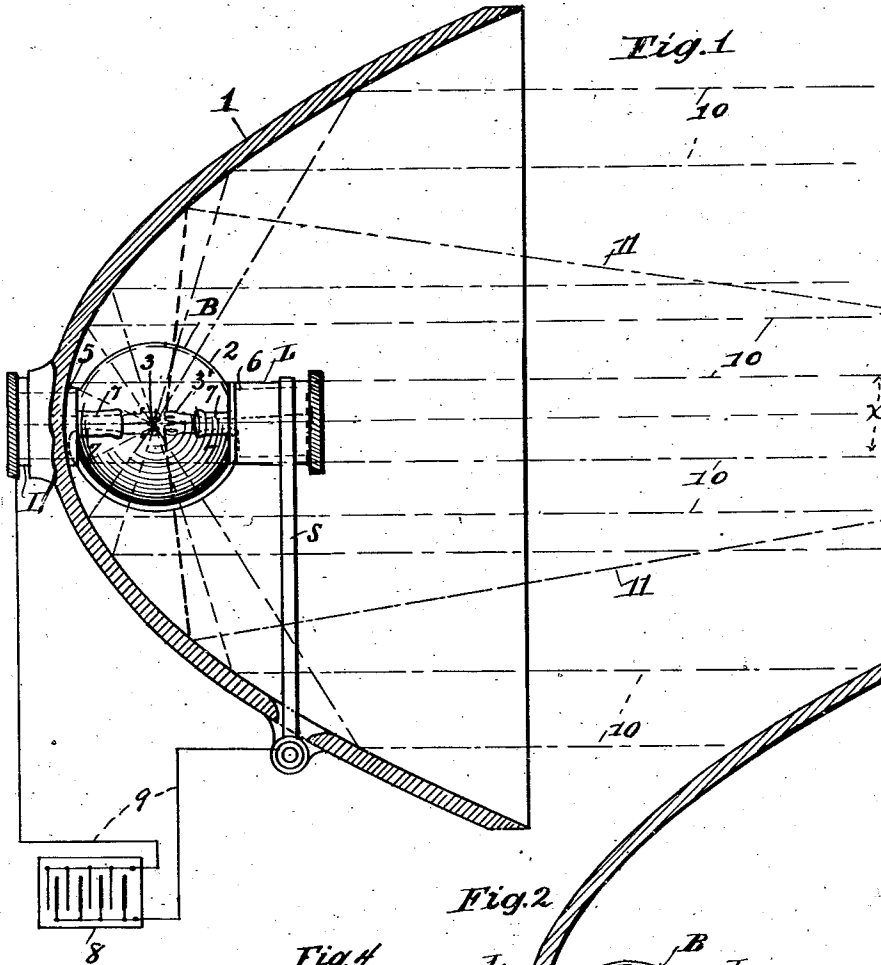


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INCANDESCENT LAMP.

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1,048,017.

Patented Dec. 24, 1912.



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INCANDESCENT LAMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THEODORE A. WILLARD, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Incandescent Lamps, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention has reference to the use of incandescent lamps for illuminating a parabolic reflector such as is employed for the headlight of a railway locomotive or high speed road engine or automobile.

The objects of the invention are to provide for this purpose an incandescent lamp of low voltage adapted for use with a storage battery, the lamp having a plurality of filaments, bases and leading in wires, to so arrange and dispose the filaments relatively to each other and to the focus of the reflector as to obtain the greatest amount of concentration of light in as nearly the focal position as possible, and also to so dispose the bases that the zone of shadow or interception of the rays of light from one filament caused by the base of another filament will be dispersed by the light from another filament.

A further object is to reduce the size of the leading in wires by employing more than one set thereof, whereby a higher candle power at a low voltage can be obtained.

The employment of a plurality of filaments in one lamp has the further advantage in adaptability to railway and automobile service that if one filament should become inefficient or destroyed another can take its place and the entire loss of the use of the reflector of the headlight will be avoided until a fresh base or filament can be substituted for the one destroyed.

To accomplish these objects a plurality of filaments and bases are inserted in a common bulb, and the filaments are adjusted as closely together as possible therein so that they may be substantially in the focus of the parabola of the reflector. Preferably one of the filaments should be actually located at the focal point, and the other or others should be as close to it as possible. When the filaments are employed they and their

other just in front of it, so that the rays of light from the focal filament will be reflected in strictly parallel lines, and the rays of light from the outer filament will be reflected in converging lines and therefore will tend to dissolve the shadow caused by the base of the outer filament. When there are more than two filaments other forms of arrangement can be made to obtain the best results.

The invention further comprises the combination and arrangement of parts and manner of construction of the various details as hereinafter described, shown in the accompanying drawings and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a vertical central section of a parabolic reflector showing a two filament or double incandescent lamp therein, the filaments being connected together in series; Fig. 2 is a similar view showing the filaments connected in parallel; Fig. 3 shows an arrangement of three bases and filaments in one lamp; Fig. 4 is an elevation of contact device.

In these views 1 is the reflector, B the bulb; 3 is a filament located at the focal point; 3' is a filament located just in advance of the focal point and closely adjacent thereto; 5 and 6 are the bases for the respective filaments; L, L, are the sockets, which are insertible in a cylindrical opening in the reflector. Into these sockets the bases 5 and 6 are screwed; 7, 7' are the leading in wires, for the filaments. 8 is a storage battery, and 9 the circuit.

10, 10, are diagrammatic rays from the focal filament which are shown parallel to each other and which are intercepted in a central zone by the base 6 of the outer filament which hence would cause a shadow in the center of the field of illumination, at $x-x$, and hence an imperfect disclosure of the forms of objects in the path of the engine. The light from the second filament 3' will greatly increase the illumination and since it is located slightly beyond the focal point of the reflector its rays 11 will fall thereon at a slightly sharper angle and will be reflected outwardly toward the axial line of the parabola instead of in lines parallel therewith, thus tending to completely dissolve the shadow caused by the base of the

angle of reflection and become more perfect as the focus of these converging rays corresponds with the distance from the lamp of the objects which the lamp is designed to illuminate.

To make the suitable circuit connections, with the outer filament and base, the contacts shown in the figures may be employed. These may be folding for adjustment of the bulb as shown and comprise two metallic strips S, S', separated by a suitable insulation 7^a, when the filaments are connected in parallel, or a single contact strip S can be used when the filaments are connected in series. The contacts S and S' constitute an adjustable support for the outer end of the lamp. The contact or contact strips should be as thin as possible so as not to interfere with the reflected rays of light.

When three or more filaments 3², 3³, 3⁴, are employed as shown in Fig. 3 they all are located closely adjacent to, or substantially in the focal point of the reflector, and when two are used they should both of them be preferably substantially in the focus or as close to it as possible.

The angles of incidence and reflection from the rays of light of the several filaments will be slightly different and will cross each other, and therefore the rays from one of the outer filaments will tend to dissolve the shadow of its own base made in the path of the rays of light from the inner filaments.

In Fig. 5 a two filament incandescent lamp is shown both filaments being placed in as near the focal point as possible, or having it between them.

Having described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination with a reflector, an incandescent lamp therefor, comprising, a bulb, and a plurality of bases, leading in wires and filaments therefor, one filament being located substantially at the focal point of the reflector, and another base and filament located outside of said focal point, said filaments being in axial line with each other, whereby the shadow occasioned by the interposition of the second base in the reflected parallel rays of the first filament will be dissolved by the non-parallel reflected rays of the second filament, and an adjustable contact device for said lamp.

2. In combination with a reflector, an incandescent lamp comprising a bulb and a plurality of bases, and of filaments closely

approximated therein in axial line, said filaments being located substantially in the focal point of said reflector, whereby the rays emanating therefrom will be reflected in lines substantially parallel to the axis of the reflector and an adjustable contact for one base.

3. In combination with a reflector, an incandescent lamp therefor, comprising, a plurality of bases, leading in wires and filaments, and a common bulb therefor, one of said bases being inserted in the said reflector, and its filament located in substantially the focal center of said reflector, whereby the angles of incidence and reflection are different in the rays emanating from said filaments, and a folding contact device for the outer filament.

4. In a lamp, a parabolic reflector, an incandescent lamp having a base secured in the reflector, a filament for said lamp located in the focal center of said reflector, another filament therefor, located in the line of the axis of said reflector, outside of said focal center, the reflected rays of light emanating from the first named filament extending in a direction parallel to the axis of the parabola, and the reflected rays of light emanating from the second mentioned filament extending at an angle to said axial line, and an adjustable contact for said bulb.

5. In combination, a reflector, an incandescent lamp therefor, a plural number of filaments therein, a plural number of bases and leading in wires for said filaments, and a common bulb, said filaments arranged substantially in the focal center of the reflector, one of said bases secured in the said reflector, and an adjustable contact for said bulb.

6. In combination with a reflector, an incandescent lamp bulb, a plurality of bases, sockets and filaments therein, one set of said bases and sockets secured in said reflector, said filaments arranged substantially in the focal point of the reflector, a source of electricity, and electrical connections whereby said filaments can be singly or simultaneously caused to glow, said bulb being inserted axially in said reflector, to permit of placing the focus of the reflector between them.

In testimony whereof, I hereunto set my hand this 31 day of January, 1910.

THEODORE A. WILLARD.

In presence of—

WM. M. MONROE,
GEO. O. WILLET.