Feb. 28, 1939. M. C. HARLEY 2,149,172

ELECTRIC LAMP

Filed Dec. 15, 1937 2 Sheets-Sheet 1

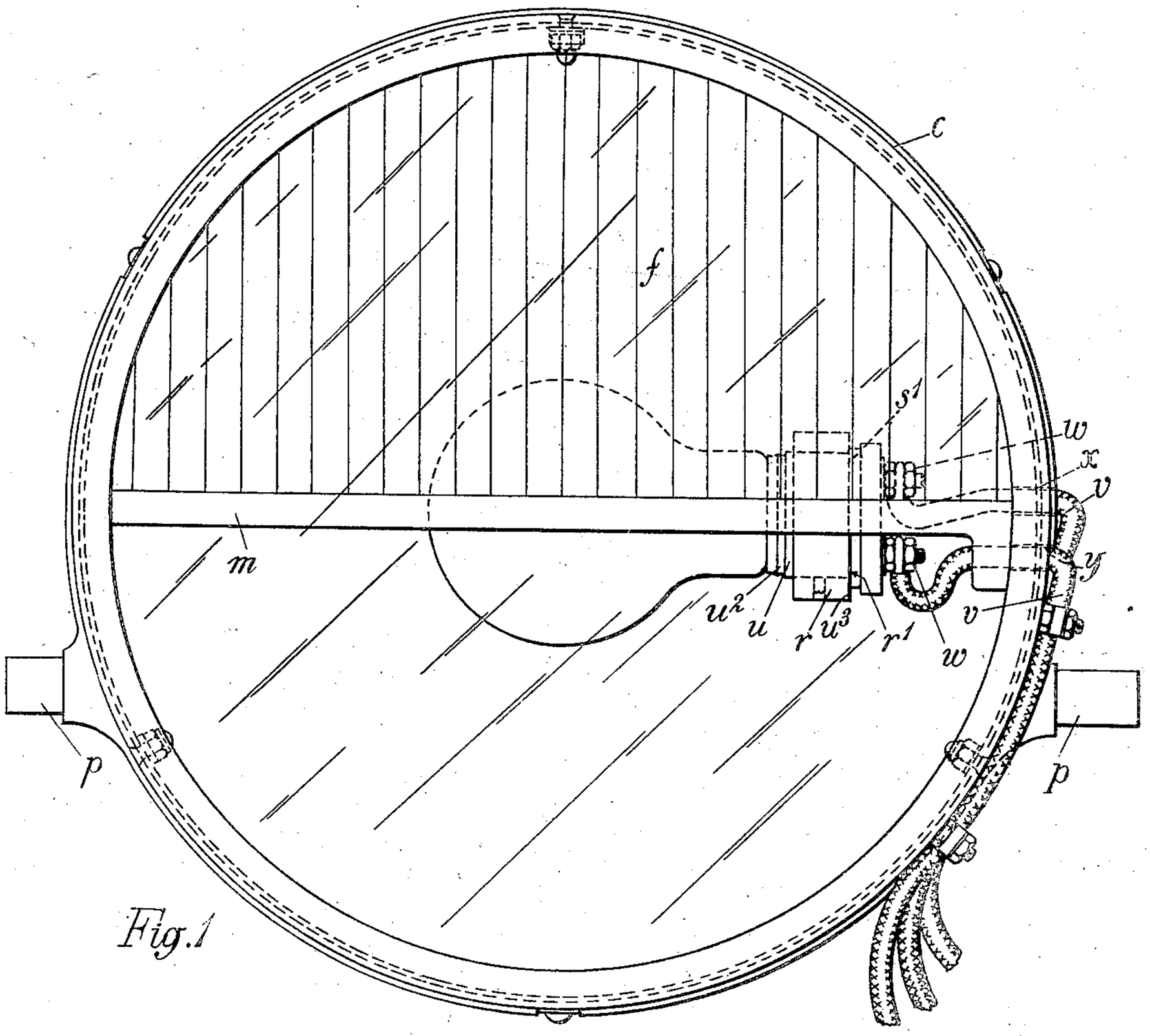

Fig. 1

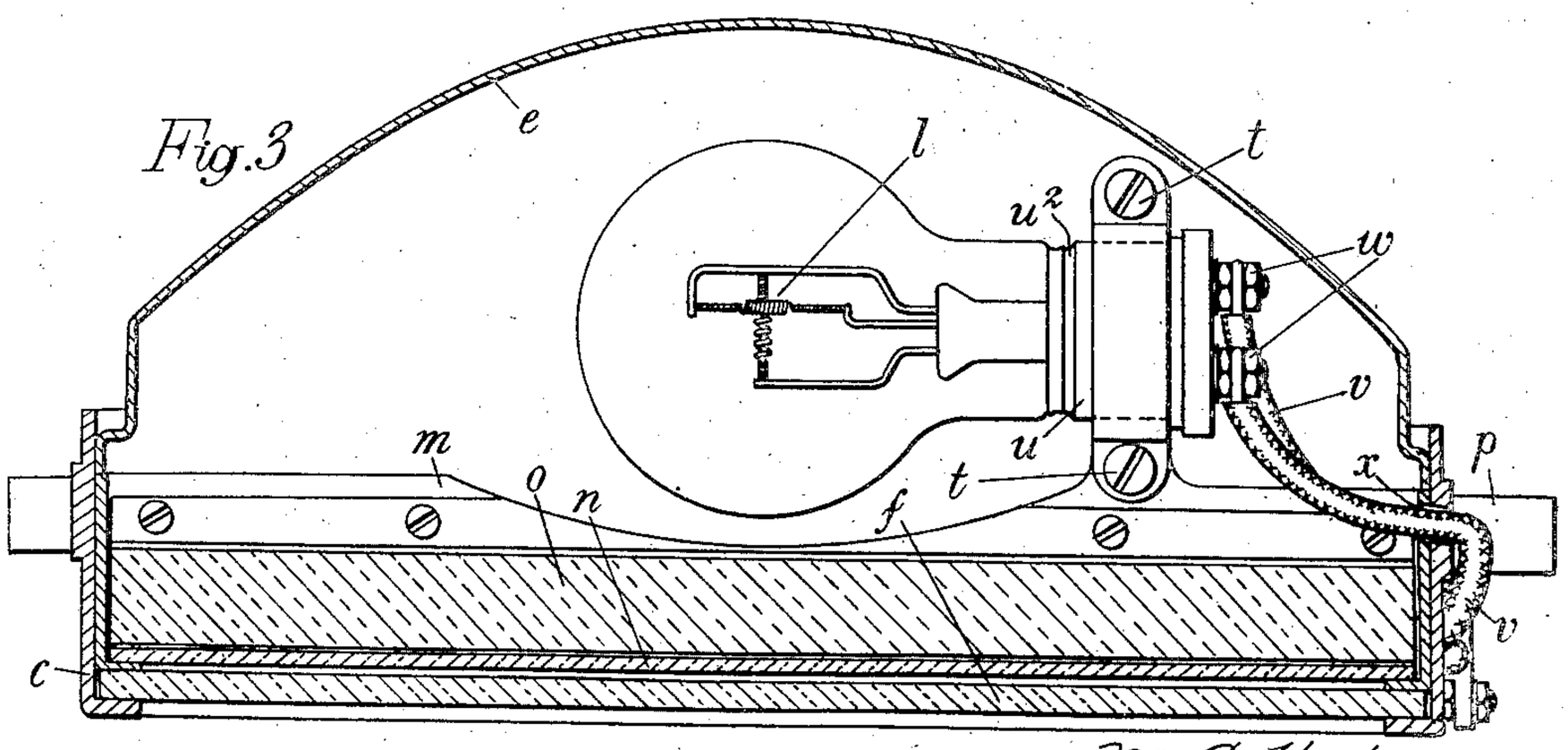

Fig. 3

M. C. Harley
INVENTOR
By: Glascock Downing & Seebold
Atty's.

Feb. 28, 1939. M. C. HARLEY 2,149,172

ELECTRIC LAMP

Filed Dec. 15, 1937 2 Sheets-Sheet 2

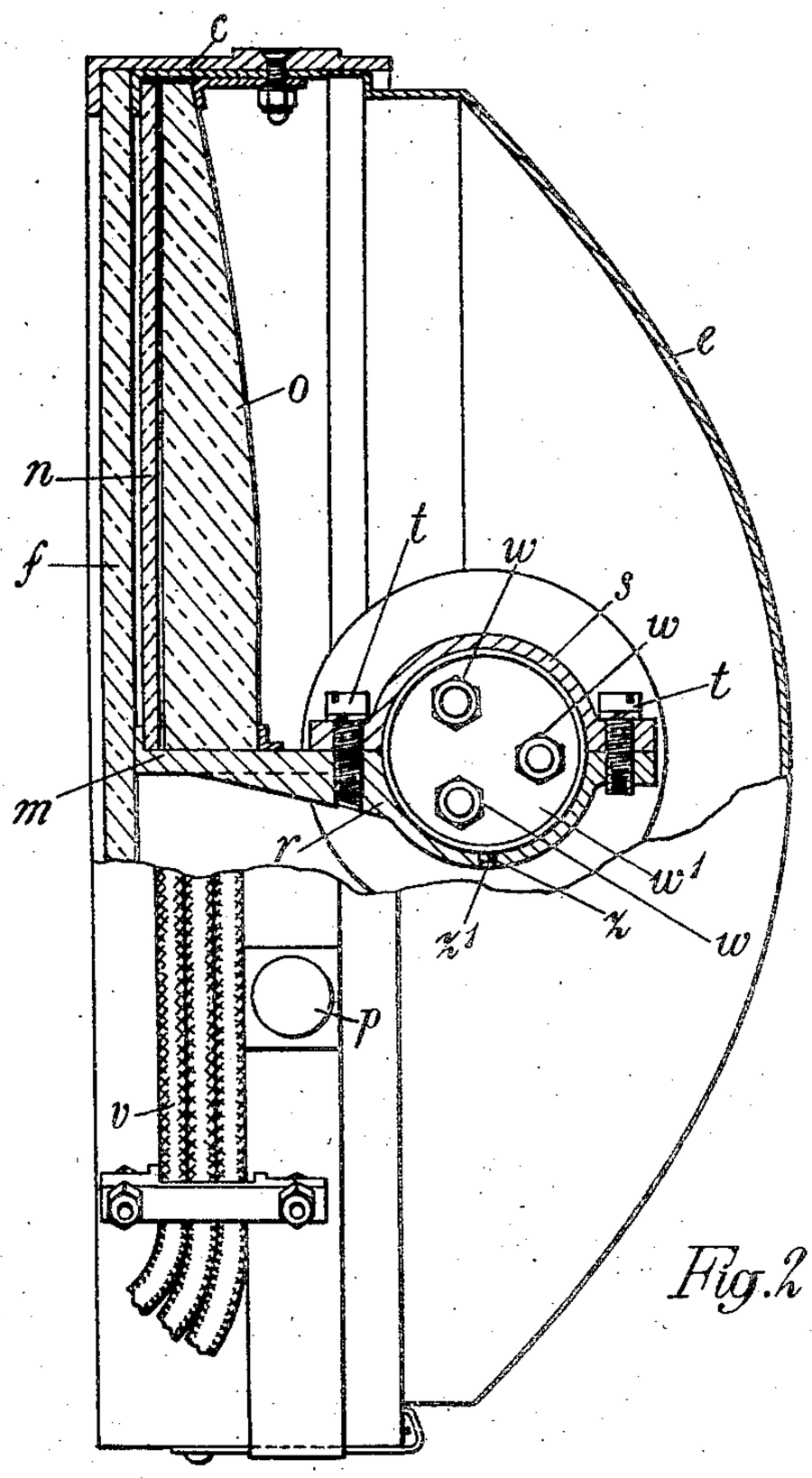

Fig. 2

M. C. Harley
Inventor

By: Glascock Downing & Seebold
Attys.

Patented Feb. 28, 1939

2,149,172

UNITED STATES PATENT OFFICE

2,149,172

ELECTRIC LAMP

Maldon Cavendish Harley, Harlington, Hayes, England

Application December 15, 1937, Serial No. 179,991
In Great Britain November 4, 1936

2 Claims. (Cl. 240—7.7)

This invention relates to electric light bulbs and their attachment or mounting.

Lamp bulbs have hitherto comprised a bulb adapted for holding in position by a common type of bayonet or screw connection in a holder attached to or in relation to a reflector casing or other part according to its intended purpose, contacts being effected through spring plungers or the like. It is found that such arrangements are not wholly satisfactory, more especially on account of the bulkiness incidental to thorough electric insulation, their want of rigidity, and/or their weight, which are all important considerations where, as for example in aircraft, a lamp, especially a landing or take-off lamp, should be kept down to the lightest possible construction consistent with robust design and accuracy of focussing.

It is known, in the manufacture of the so-called prefocus cap electric light bulbs of the kind hitherto used for certain purposes, to form the metal cap in two sections and, after one has been attached to the bulb over the filament lead pinch, to set the other section in correct relationship with the first for uniting the two; in such a way that, with the bulb mounted in jig means having a bayonet, screw or other such holder of the kind in which it is intended to be held in use, the bulb filament may be set in predetermined and accurate relationship or focus. The union of the cap parts is effected by soldering, sweating or the like; and once thus made will be of correct focus for all lamp reflectors of construction corresponding to the jig.

According to the present invention, a bayonet, screw or equivalent form of holder as at present employed is omitted, and the lamp bulb is secured firmly in correct position by direct grip on its cap part of clamp or bracket means forming a part of the construction on or in which the bulb is to be used.

The invention includes a mounting for electric lamp bulbs, according to which the bulb is secured by direct grip of clamp or like means upon a section of a metallic cap which is positionally related to another section and the bulb filament system to secure exact and constant relationship of said system to said clamp or like means.

The invention also includes the combination in a projecting lamp, a reflector, a metal-capped lamp bulb within and having a filament system appropriately positioned in relation to said reflector, a transverse member at the fore part of said reflector, and rigid attachment between said member and the lamp-bulb cap.

The invention also includes a mounting for projector lamp bulbs, comprising a front ring providing an attachment reinforcement and/or support for said reflector, a member practically integral with said ring and traversing the same more or less diametrically, and means providing a clamping attachment for a capped lamp bulb extending generally along the reflector side of said member.

Referring to the accompanying drawings:—

Figure 1 is a front elevation of an aircraft lamp according to the present invention;

Figure 2 is a part sectional side elevation,

Figure 3 being a sectional plan in the diametric plane.

In the drawings is shown a projecting lamp intended primarily for use as an aircraft landing or take-off lamp; to be used in any suitable form of mounting so that it may be swivelled to different angular positions and/or into and out of a suitable housing about suitable pivots such as those indicated at *p, p,* but which mounting is immaterial to the present invention. (It may be noted, however, that a form of mounting of which parts are shown herein is the subject of a co-pending application in which a cognate invention is described and claimed.)

In this construction the lamp comprises a front ring assembly *c,* say of aluminium, carrying a front *f,* and a reflector *e* of a shallow form hereinafter noted. Running across that diameter of the ring *c* which is ordinarily horizontal and transverse to the axis of flight is a member or bar *m* suitably and rigidly secured at its ends in any way, or if desired integrally cast with the ring.

Besides forming a convenient support as shown for lens elements or refractors *n* and *o* for beam regulation, the bar *m* forms a mounting for the lamp bulb. Thus, some distance from one end, the bar develops inwardly to form a clamping bracket *r* machined carefully to present a bearing or journal the complementary top section *s* of which is fixable by cap screws. The lamp bulb cap *u* is clamped in the journal in a way described hereinafter, so as to locate the filament or filaments as at *l* accurately in or related to the reflector focus. The leads as *v, v,* from the filament or filaments, instead of being brought out of a cap requiring substantial external insulation and support, including also a multiplicity of small and fragile parts liable to derangement and to short circuiting, are brought out to substantial screw or other terminals or binding posts *w, w, w,* mounted in an insulating closure or filling mem-

ber w_1 in the cap structure itself. The latter, e. g. in an aircraft or other projecting lamp required to have accurate optical focus and characteristics, preferably comprises more or less tubular telescoped members u, u_2 soldered or otherwise united in correct relationship after correctly setting the filament in relation to the cap by jig means in the manner already broadly known.

In the case of a projecting lamp, and especially an aircraft lamp or motor vehicles headlamp, the clamp or bracket, supported within the lamp body on a transverse or diametrical member as described above, is accurately machined or bored internally to fit around the outer periphery of the lamp bulb cap u; if not formed in halves as shown, it is preferably otherwise arranged for facilitating assembly and provided with alternative means enabling the bulb to be firmly gripped or pinched.

The cables may be brought into the lamp body through one or more relatively small simple perforations therein as at x, y for attachment to the terminals referred to. The peripheral portion of the bulb cap which is gripped as above may be formed by spinning, with or without machining for accuracy of dimension, and it is preferably provided with a shoulder u_3 accurately faced for endwise engagement at r_1, s_1 with the metal of the clamp so that correct focussing may be obtained simply and accurately, by exact registration of the parts as in the jigs referred to. In order to ensure the filament or filaments lying in correct rotational position corresponding also with the jig methods, a stop, peg or other like means z is preferably provided on the outside of the cap adapted to enter an accurately complementary notch or recess z_1 formed in the supporting clamp, preferably in the base part r.

The foregoing provisions avoid the need for more or less bulky holders of the type at present employed, while practically eliminating short-circuiting risks as well as the unsatisfactory or unreliable contact means associated therewith: they also considerably lighten the construction of a lamp. Full use is made of the internal space of the reflector-front assembly for accommodation of the bulb and holder: thus these latter parts in no wise protrude, as they do in previous constructions. A shallow reflector form, of great advantage in aircraft uses, is adaptable as shown, and much space is saved in the axial sense, apart from the advantage that the construction has an uninterrupted, smooth and clean exterior with all live parts safely protected.

The foregoing specific description is given by way only of example, and modifications may be introduced within the spirit of the invention. Thus it may be applied, at least in some of its aspects, to lamps for illuminating instrument boards, indicator lamps, that is to say, small lamps as well as the larger kind.

I claim:

1. In a projecting lamp the combination of, an annular front member having a chord-like transverse member integral therewith, a substantially parabolic reflector mounted against one side of said annular member, an extension of said transverse member off-set from the center of the annular member and directed inwards of the reflector forming part of a clamp, an electric lamp bulb arranged generally in the plane of said transverse member and having an integral prefocus cap with precision-finished surfaces received in complementary surfaces of said clamp part, and a second clamp part arranged over said surfaces of the lamp cap to secure the lamp rigidly in determined position in the reflector.

2. A projecting lamp according to claim 1 having a semi-circular refracting lens arranged within the annular front member and supported by said chord-like transverse member.

MALDON CAVENDISH HARLEY.