

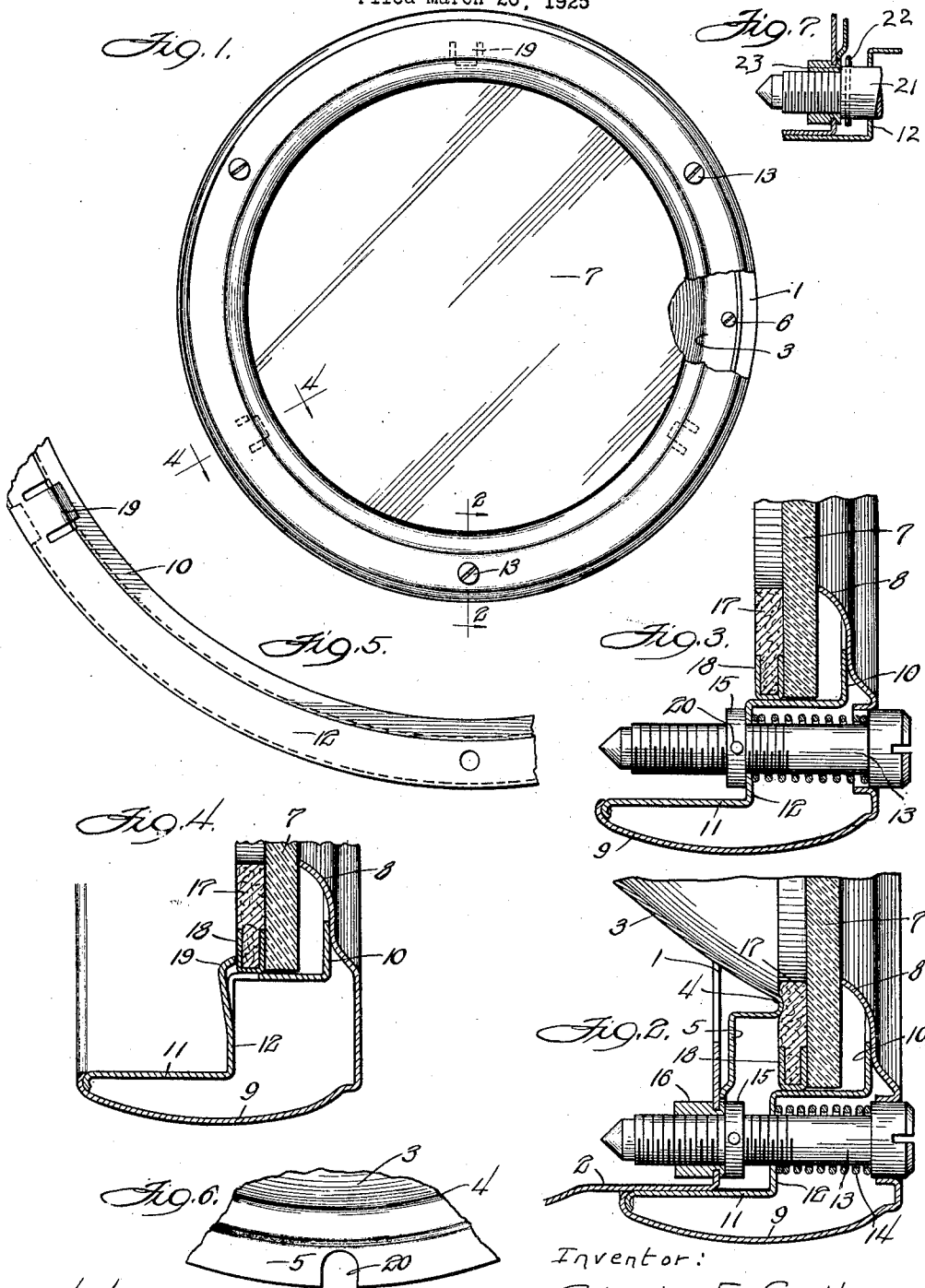
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LAMP DOOR LOCK

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LAMP-DOOR LOCK.

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My invention relates to means for fastening the doors of lamps to the bodies or casings, and in general aims to provide simple, easily manipulated and inexpensive fastening means for this purpose which will afford a tight and non-rattling seal while automatically compensating for variations in the size of various parts of the lamp.

In many classes of lamps, and particularly in automobile headlamps, it is important that means should be provided for keeping the lamp front or door firmly attached, while readily permitting a detaching of the same. It is likewise important that the fastening means employed for this purpose should compensate automatically for variations in the thickness of the glass lens and for any warpage of the glass, and also for variations in the thicknesses of the packing ring associated with the lens and of the metal parts in or adjacent to the lens ring. Heretofore, lamps of this class have commonly been provided with door fastenings means arranged so that the door can be attached or detached by bodily rotating the lens ring to a certain extent, and springs have been used in that connection to compensate for variations in the size and shape of the associated parts. To insure a firm holding of the door in its attached position, the needed springs usually have to be made so stiff that it is difficult to rotate the door or lens front in either its attaching or detaching direction. Consequently, careless lamp users have often damaged some of the lamp parts, particularly when relatively thin metal was employed for their construction.

It has also been customary in lamps of this class to employ a sealing ring made of a cord or the like, this ring being seated in an annular groove at the mouth end of the reflector so as to be clamped between the reflector and the glass lens when the door is attached. This sealing ring is commonly cemented to the reflector, thereby requiring a new ring to be furnished in case the reflector is replaced, and also permitting the cement to be loosened in damp or foggy weather, so that the sealing ring may drop out of the lamp when the door is detached.

My present invention aims to overcome all of these objections to the arrangements heretofore employed while also providing a less expensive construction. Furthermore, it aims to provide a lamp door lock in which

the same springs which compensate for variations in the size and shape of the associated parts on the door and the mouth end of the lamp will also force the door forwardly when the locking means are relaxed, thereby avoiding the necessity of using force in detaching the door. Furthermore, my invention aims to provide a lamp door fastening which will have the above recited advantages and which will be equally suitable for use with doors sleeved upon mouth end of the casing, doors hinged at one end of the casing, and doors of the hook-on type.

In some of its more particular aspects, my invention provides a door lock employing one or more fastening screws and having these screws permanently carried by the door, so that these screws cannot be lost, and which will not require the door to be rotated in attaching or detaching the same. It also provides a locking arrangement in which the screws connecting the lamp door to the lamp body exert their fastening pressure through springs and in which the screws are limited as to their inward screwing, thereby avoiding an overstraining of any of the parts of the door and also permitting each spring to compensate for variations in the size and shape of parts adjacent thereto. Furthermore, my invention provides an arrangement of this general type in which each screw is arranged for positively pushing the door off the lamp body when the screw is retracted, and one in which the screw heads can be substantially housed by the lens ring of the door when the door is attached, so as to make the screws normally inconspicuous.

In a further aspect, my invention provides a sealing arrangement in which the sealing ring is carried by the lens ring of the door and is detachably secured to this ring, provides an arrangement which will permit a flat ring of felt or the like to be employed for this purpose, and provides a simple and inexpensive mounting for such a ring. Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which—

Fig. 1 is a front elevation of a lamp embodying my invention, with a portion of the door broken away to show one of the screws which fasten the reflector to the lamp body.

Fig. 2 is an enlarged and fragmentary longitudinal section through a forward portion of the same lamp, taken radially of the axis

of the lamp through one of the fastening arrangements and showing the parts as they appear when the door is attached to the lamp body.

5 Fig. 3 is a similarly enlarged section taken through the door or lens front alone when this is detached from the lamp body.

Fig. 4 is a similarly enlarged section along the line 4—4 of Fig. 1.

10 Fig. 5 is a fragmentary rear view of the lens ring drawn on a scale intermediate of Figs. 1 and 2, showing one of the clips which hold the packing member in position.

Fig. 6 is a fragmentary elevation of a mouth portion of the reflector, showing one of the notches which keep the reflector clear of the parts constituting the door lock.

15 Fig. 7 is a fragmentary section similar to a portion of Fig. 2, showing the use of a spring cotter for affording the stop and push shoulders on one of the door-fastening screws.

In the embodiment of the drawings, the illustrated lamp includes a body or casing 25 having a lateral wall provided with a rigid shelf, here shown as an annular flange 1 extending radially inward of the casing at the mouth end thereof, and having the lateral wall portion 2 adjacent to the said mouth substantially cylindrical. The reflector 3 of the lamp is recurved at its mouth so as to afford a forwardly directed annular mouth portion of a convexed section radially of the reflector and so as to provide an 30 outwardly directed radial flange 5 which bears against the forward face of the casing flange or shelf 1 and which is secured to the latter by screws 6, one of which screws is shown in Fig. 1, thereby securing the reflector to the lamp body or casing independently of the door fastening means.

35 The door of the illustrated lamp comprises a glass lens 7 carried by a lens ring, which ring is composed of two annular 45 members. The outer ring member has a frontal portion 8 overhanging the radially outer part of the lens 7 and having its inner edge turned rearwardly as shown in Fig. 3 so as to engage the lens at a distance from the periphery of the latter. The outer ring 50 member also includes a side portion 9 extending rearwardly of the lamp and here shown as having its extreme rear end turned radially inward of the lamp into edgewise engagement with the cylindrical mouth portion 2 of the lamp casing. The inner ring 55 member is of a stepped section, formed so that its radially inner portion 10 bears against the rear of the frontal portion of the outer member 9 and is welded to the latter; while its rear end portion 11 is cylindrical and of a bore slidably fitting the body portion 2, so that it can be sleeved upon the latter in good fitting relation. The extreme 60 rear end of this part 11 desirably engages

the inwardly turned rear end of the outer ring portion 9, so that the latter will receive any rearward thrust on the inner ring member.

The part of the inner ring member between 70 the said portions 10 and 11 is formed to afford a ledge 12 which is spaced rearwardly from the front portion of the outer ring member. The outer ring member and the ledge 12 are provided with perforations 75 aligned longitudinally of the lamp and of a number corresponding to the number of fastening means that are to be used, this number being three where three screws 13 are employed for that purpose as shown in Fig. 80 1. In each case, the perforation in the ledge 12 is of such a size as to permit the shank of the screw to slide freely through it; while the perforations in the front ring member not only permits the adjacent portion of the screw to slide through it, but desirably is of 85 a sufficiently large diameter to permit it to house the head of the screw. Interposed between the head of the screw and the ledge 12 is a compression spring 14 which continuously tends to slide the screw forwardly 90 through the said perforations, but which is limited as to the extent of such sliding by stop means associated with the screw. These stop means are here shown as formed by a collar 15 fastened by a pin 20 to the shank of the screw behind the ledge 12, so that the forward sliding of the screw is limited by the engagement of the said collar with the ledge. 95

To receive the screw, I provide the lamp 100 body or casing with a correspondingly threaded and aligned part, this being here shown as a nut 16 rigidly clinched to the shelf or flange 1 on the lamp body, which flange forms the stop means for resisting an inward pressing of the reflector in the illustrated embodiment. 105

To secure the glass lens 7 to the lens ring and to seal the door against the entrance of moisture and dust, I employ a packing ring 17, 110 which may be a flat ring of felt or the like, and which ring desirably has its radially outer portion clamped in a U-sectioned binding ring 18. This metal binding ring 18 snaps under fingers 19 formed from the inner member of the lens ring and is pressed 115 by these fingers against the glass. The bore of the felt ring is slightly smaller in diameter than the convexed mouth end 4 of the reflector, thereby causing this end of the reflector to engage the felt when the door is sleeved upon the lamp casing. 120

Upon rotating the screws 13 so as to thread them into and through the nut 16, the lens ring is forced rearwardly (or inwardly of the lamp body) by pressure exerted from the head of the screw through the spring 14 on the ledge 12 of the lens ring, thereby compressing and somewhat 125 distorting the felt packing ring as shown in 130

Fig. 2. However, the extent of threaded attaching of the screw is limited through the engagement of the collar 15 on the screw with some part associated with the lamp body. For this purpose, I am here showing this collar in Fig. 2 as engaging the outer end of the nut 16, this end being spun over the forward face of the flange or shelf 1.

With the door thus attached, it will be evident from Fig. 2 that the pressure of the screw is not exerted directly on the lens ring, but only through the intermediary of the spring. Consequently, the spring will compensate automatically for variations in the thickness of the felt or the extent to which the felt is compressed, for variations in the thickness of the glass or any irregular shaping due to the warping of the glass, and also for variations in the thickness and the assembling of different parts of the lens ring.

When the door is to be detached, the initial slackening movement of each screw allows the corresponding spring to expand and if the lens ring portion 11 fits fairly tightly on the body portion 2, the lens ring may remain stationary until the collar 15 engages the ledge 12. Then a further backing of the screw out of the nut 16 causes this collar 15 to push the lens ring outwardly or off the lamp body, so that the retracting of the screws automatically forces the door off the lamp body. At the same time, the collar 15 also cooperates with the spring in retaining the screw on the lens ring, so that it cannot become lost or misplaced.

By spacing the screws uniformly, I can permit the door to be attached interchangeably in various positions differing rotationally of the lamp, and by mounting the packing ring on the door, I avoid any accidental dropping or losing of the packing ring, such as sometimes occurs with packing rings slipped into grooves on the reflectors. The reflector also has uniformly spaced peripheral notches 20 each of which clears one set of the cooperating fastening elements, namely a screw 13 and the nut 16 associated with this screw, so that the reflector remains in undisturbed position when the door is detached.

Since the screws are positively stopped in their fastening direction, they cannot be screwed down too hard, thereby avoiding an overstraining of the springs or other lamp parts by unexperienced persons. Moreover, the spring assists in the detaching of the door instead of deterring the detaching as has been the case in constructions heretofore employed, and the obviating of any rotational movement of the door also makes it easier even for inexperienced persons to attach or detach the same. So also, by forming the perforations in the frontal lens ring

member so that each of them can slidably house the head of the corresponding screw, I can cause this screw head to close the perforation when the door is attached, thereby preventing dust from entering the interior of the lens ring in which the springs are mounted.

However, while I have illustrated and described my invention in an embodiment including desirable shapes of various parts, I do not wish to be limited to these or other details of the construction and arrangement thus disclosed, it being obvious that many modifications might be made without departing either from the spirit of my invention or from the appended claims.

For example, Fig. 7 shows another construction of a part of the fastening means, namely one in which the screw 21 has a spring cotter 22 extending through it and disposed for engaging the lens ring portion 12 to limit the retraction of the screw by the spring. In this case, I preferably provide the shank of the screw with a shoulder 23 adapted to engage a part of the lamp casing to limit the inward screwing of the screw, as for example by making the part of the shank between the screw head and the threaded portion of a larger diameter than the threaded portion.

I claim as my invention:

1. A lamp housing comprising a forwardly open casing, a door including a peripheral member having a space therein between two parts spaced longitudinally of the casing; the said parts having a pair of perforations alining longitudinally of the casing; a freely rotatable screw extending slidably through the alined perforations and threaded into the casing; a compression spring disposed between the head of the screw and the more rearward of the said spaced parts, the spring being of such length as to be compressed when the screw is threaded into the casing, whereby the screw holds the door against the casing by pressure transmitted through the spring; and push means fast upon the screw and extending laterally beyond the threaded portion of the screw, the said push means being disposed for engaging a part of the door upon partial retraction of the screw from its threaded engagement with the casing, the said engagement causing the further retraction of the screw to push the door off the casing.

2. A lamp housing comprising a forwardly open casing and a lens carrying door having a ledge transverse of the axis of the casing, a screw extending slidably through the ledge from the front thereof and threaded into a portion of the casing, a compression spring interposed between the ledge and a more forward portion of the screw, and a reflector mounted in the casing and disposed for engaging the door

to limit the rearward movement of the door to position in which the ledge is freely spaced from the casing portion into which the screw is threaded; the screw having

means thereon for limiting its screwing into the said portion, so as to prevent the spring from being collapsed by the said screwing.

3. A lamp housing comprising a forwardly open casing member, a lens-carrying door for the forward end of the casing member, a reflector mounted within the casing member and having a mouth end portion disposed adjacent to the lens of the door, a packing member interposed between the lens and the said mouth end portion of the reflector, a screw member extending slidably through a portion of the door from the front thereof and threaded into a part of the casing, the screw member having a shoulder disposed for engaging a part of the casing member to limit the threaded attaching of the screw member to the casing member, a spring interposed between the screw member and a part of the door and arranged for continuously urging the screw member forwardly and for pressing the door rearwardly when the screw member is in its said limited attached position, the screw member having another shoulder disposed for engaging a part of the door to limit the forward sliding of the screw member with respect to the door by the action of the spring.

4. In a lamp, a forwardly open casing, a forwardly open reflector supported within the casing, a door sleeved upon the mouth of the casing and including a peripheral member slidably sleeved upon the mouth end of the casing, the door having a portion disposed for engaging the mouth of the reflector; a plurality of means carried by the door and spaced circumferentially of the latter and connecting the door with the casing; each of the said means comprising a threaded member extending longitudinally

of the casing and rotatable from the front of the casing, and threaded into a part of the casing, and a spring interposed between the door and the threaded member and operating through the threaded member to force the door rearwardly of the casing when the threaded member is rotated in one direction, each threaded member having another portion disposed for pushing the door off the casing upon prolonged rotation of the said member in the opposite direction; the said means comprising the entire instrumentality for securing the door to the casing.

5. In a lamp, the combination with a forwardly open body, a detachable door sleeved upon the mouth of the lamp body and including a pair of annular portions radial of the casing and disposed one behind the others, the said door portions having alined perforations therein, screws extending through the alined perforations in the said door portions and each threaded into the body and accessible from the front of the door for rotating the screws, the body having a shelf disposed behind the more rearward of the said portions, a reflector mounted in the body and having parts thereof respectively engaging the body and the door so as to space the shelf from the said more rearward portion, spring means interposed between each screw and the door for continuously urging the screw forwardly, and means carried by each screw and disposed in the space between the shelf and the more rearward of the said portions for limiting the rearward movement of the screw with respect to the body and the forward movement of the screw with respect to the door, the said screws and springs constituting the entire means for removably securing the door to the body.

Signed at Detroit, Michigan, March 19th, 1925.

CHARLES E. GODLEY.