June 20, 1939. I. C. McKECHNIE ET AL 2,162,819

TOOL

Original Filed Oct. 2, 1936

Fig. 1.

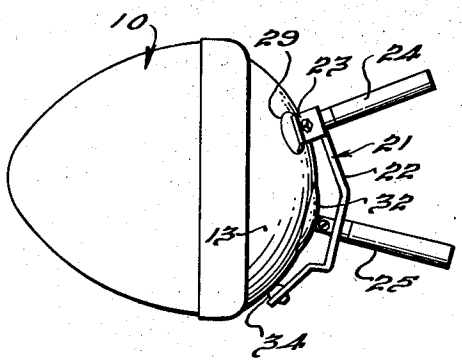
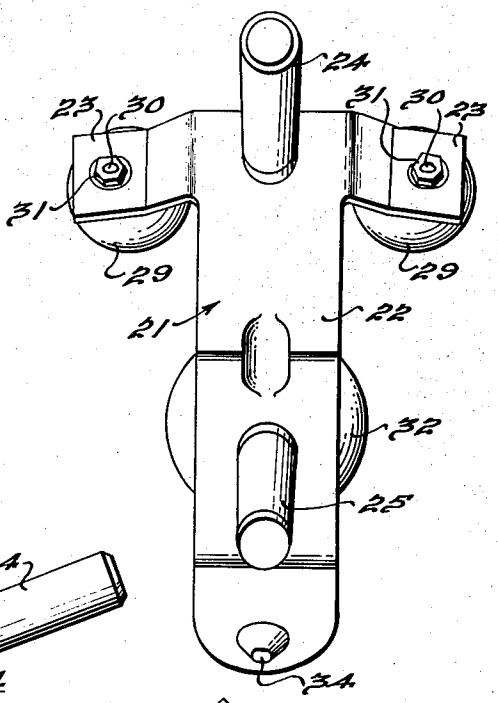


Fig. 3.



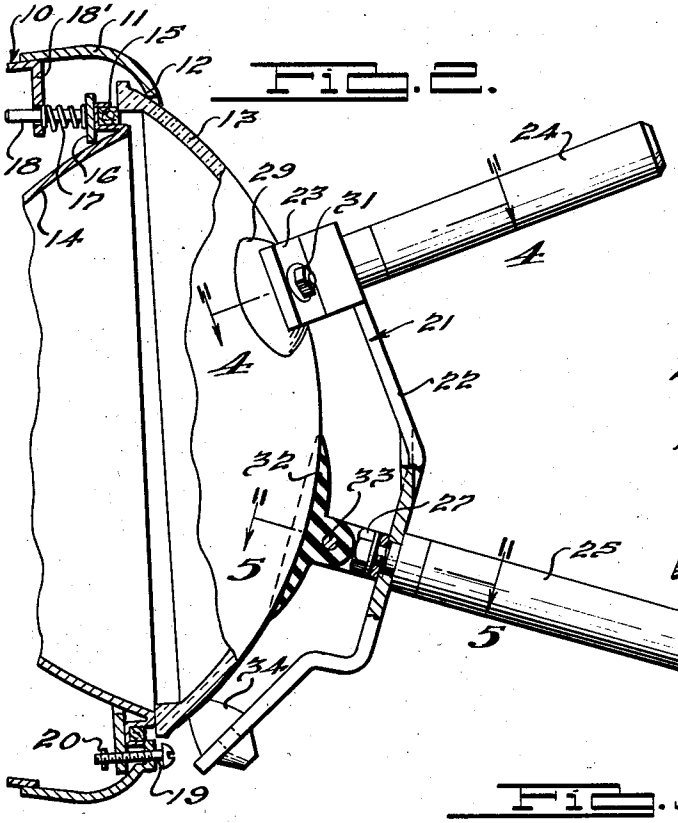


Fig. 2.

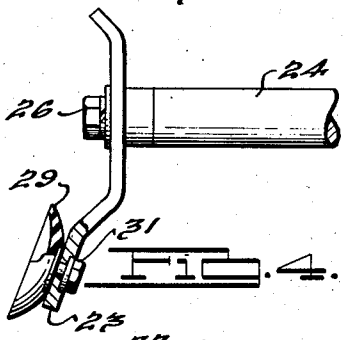


Fig. 4.

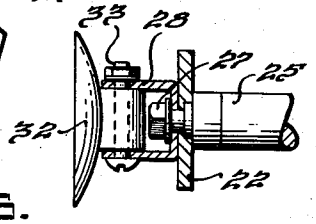


Fig. 5.

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2,162,819

TOOL

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Original application October 2, 1936, Serial No. 103,646. Divided and this application July 15, 1937, Serial No. 153,706

4 Claims. (Cl. 294—65)

This invention relates to an improved tool, and more particularly to a tool or device for removing a lens from its lamp support, although the invention in its broader aspects is not to be so limited, and this application is a division of our co-pending application Serial No. 103,646, filed Oct. 2, 1936, patented August 24, 1937, as Patent No. 2,091,050.

In vehicle headlamps wherein the lens is of the hingless type and is maintained in assembled position by a yielding self-latching device engageable with a peripheral flange of the lens, considerable difficulty has been encountered in removing the lens without breakage. To remove the lens from headlamps of this type it is necessary to first force the lens rearwardly against the action of resilient means urging the lens forwardly into engagement with the retaining means engaging the peripheral flange of the lens. This movement of the lens effects disengagement thereof from the retaining means and it is then necessary to merely shift the lens sidewise. When this operation is performed it is necessary for the workman to engage the lens with his hands but this has proved to be difficult due to the absence of a suitable gripping surface and as a result the lens in many instances is dropped and breakage occurs. Injuries have been caused to the hands of workmen by breaking of the lens during removal where it has been necessary to apply too great a degree of force.

One of the main objects of this invention is to overcome these difficulties by the provision of improved means for application to the lens for supporting the latter during removal. More specifically, the invention provides an improved support adapted for manual gripping and having means thereon for detachably engaging the outer surface of the lens to secure the latter to the support.

Another object of the invention is to provide a support for a removable headlamp lens having suction producing means carried thereby for engagement with the outer surface of the lens for securing the latter to the support.

A still further object of the invention is to provide in a support of this character improved suction producing means for securing the support to the lens to be removed so constructed and arranged as to readily conform to the contour of the adjacent surface of the lens upon application thereto.

Other objects of the invention are to provide a device for supporting a lens during removal thereof having a soft resilient yieldable surface for engaging the lens and which will not scratch or otherwise mark the latter, and to provide a device of this character which may be produced at a minimum cost.

The above being among the objects of the present invention the same consists in certain novel features of construction and combination of parts to be hereinafter described with reference to the accompanying drawing and claims, having the above and other objects in view.

An illustrative embodiment of the invention is shown in the accompanying drawing, in which:

Fig. 1 is a side elevational view of a headlamp showing the improved tool or device attached to the lens thereof.

Fig. 2 is an enlarged fragmentary view similar to Fig. 1, portions thereof being broken away and in section.

Fig. 3 is a side elevational plan view of the tool or device shown in Figs. 1 and 2.

Fig. 4 is a side elevational view, partly in section, of the tool as viewed in the direction of the line 4—4 of Fig. 2.

Fig. 5 is a side elevational view, partly in section, of the tool as viewed in the dierction of the line 5—5 of Fig. 2.

Referring to the drawing, the numeral 10 designates a headlamp for a motor vehicle having a rim 11, the front flange 12 of which engages the peripheral flange of a lens 13 having a convex outer face. A reflector 14 having a channelled periphery receiving a sealing gasket 15 which engages the inner face of the peripheral flange of the lens, is positioned rearwardly of the latter. A pressure plate 16 abuts the channelled periphery of the reflector and is urged outwardly by one of several coil springs, shown at 17, each of which is mounted on a pin 18 carried by the plate 16 and has one end portion slidably disposed in an aperture of a vertically extending flange 18' carried by the plate 16 and has one end portion slidably disposed in an aperture of a vertically extending flange 18' of the lamp structure. At other spaced locations the rim 11 and pressure plate 16 are provided with aligned openings for receiving a pin 19 having a head bearing against the outer face of the flange 12 and the other end portion thereof having an opening for a cotter pin 20 to prevent unintentional displacement of the parts. The springs 17 urge the lens 13 outwardly or to the right as viewed in Fig. 2, causing the peripheral flange thereof to be engaged by the flange 12 of the rim 11. When it is desired to remove the lens the latter is urged rearwardly, or

to the left as viewed in Fig. 2, against the action of the springs 17 to effect disengagement of the rim flange 12 therefrom and the lens is then shifted to the position shown in Fig. 2.

This invention relates more specifically to a tool or device, generally indicated by the numeral 21, for detachably supporting the lens 13 during removal or installation thereof. The tool 21 includes a body 22, of generally arcuate contour as shown in Fig. 2, having oppositely extending lateral projections 23 at one extremity thereof, and handles 24 and 25 for manual gripping. Each of the handles has a threaded reduced end portion which is received in a respective aperture in the body 22 and retained in position by nut members 26 and 27 respectively threaded thereon. A channel shaped bracket 28 having an aperture therein for receiving the reduced end of the handle 26 is also retained in position by the nut member 27.

A cup-shaped suction gripping member 29, preferably comprising rubber or other suitable material, is secured to the free end portion of each of the lateral projections 23 and has embedded therein the head of a bolt 30 passing through an aperture in the projection and retained thereby by a nut 31. The bolts 30 are so disposed that the axis thereof is substantially perpendicular to a tangent to the curved surface of the lens 13. Thus, the suction gripping members 29 have their edge portions arranged so as to approximately coincide with a tangent to the curved surface of said lens. The projections 23 are generally arcuate in contour transverse to the arcuate contour of the body 22 so that the suction gripping members 29 may be readily applied to the convex outer face of the lens 13. Another suction gripping member 32, similar to the members 29, and spaced therefrom, is pivotally mounted on a pin 33 supported in the bracket 28, as best shown in Fig. 5. By mounting the member 32 for bodily movement relative to the body of the tool, the former may be readily manipulated to adapt itself to a position for suitable engagement with the lens. A resilient abutment member 34 preferably comprising rubber is attached to the lower extremity of the body 22, as illustrated in Fig. 2, and is adapted to bear against the face of the lens 13 when the tool is applied thereto and to serve as a stop for preventing disengaging movements of gripping members during manipulation of a lens by the tool.

In removing the lens from its headlamp attachment the tool is attached to the lens 13 by engagement of the suction producing members 29 and 32 therewith through the application of manually directed force, the air being expelled from the space between the adjacent surface of the lens 13 and suction gripping members 29 and 32, creating a vacuum attachment of the latter to the lens. Removal of the lens is then effected in the manner heretofore described by the tool during which operation the latter supports the lens and the danger of breakage resulting from dropping, as when removal is attempted by direct manual engagement, is materially minimized.

While the invention is illustrated and described in connection with a lens having a convex outer face, it will be apparent that the tool may be suitably shaped for application to a lens having a different contour.

It will be understood, of course, that the tool may be utilized for handling objects other than a lens, and that the illustration herein is but one application of the invention and its use and scope is not to be limited other than by the terms of the appended claims.

1. In a device for facilitating the removal of a lens from its lamp support, a suction gripping member adapted for manual manipulation of the lens, a support for said member adapted for manual gripping to remove the lens through the intermediary of said member, and a resilient abutment member on said support spaced from said gripping member and engageable with said lens for opposing that turning movement of said support in one direction relative to said lens which normally tends to effect detachment of said gripping member from said lens.

2. In a tool of the class described for removing a detachable lens having a convex outer face comprising, a body portion having oppositely extending projections, said body portion and said projections having a contour corresponding substantially with the curvature of said lens, suction gripping members carried by said body and projections respectively for detachably securing said tool to said lens and a stop for preventing disengaging movements of the suction gripping members during manipulation of the lens by the tool.

3. A tool for use in inserting a lens in, or for removing such lens from, a lamp casing, comprising a frame, self-acting suction gripping members carried by said frame for detachably securing said tool to said lens, and a stop carried by said frame for engagement with said lens at a point spaced from said gripping members.

4. A tool for manipulating an article comprising a frame, triangularly disposed suction gripping members carried by said frame at one side thereof for holding engagement with a surface of said article, a stop on said frame for engagement with the surface of said article, and handles carried by said frame at the opposite side thereof.

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