

Dec. 26, 1950

A. A. GRADISAR
DIAGNOSTIC LAMP

2,535,916

Filed May 11, 1946

3 Sheets-Sheet 1

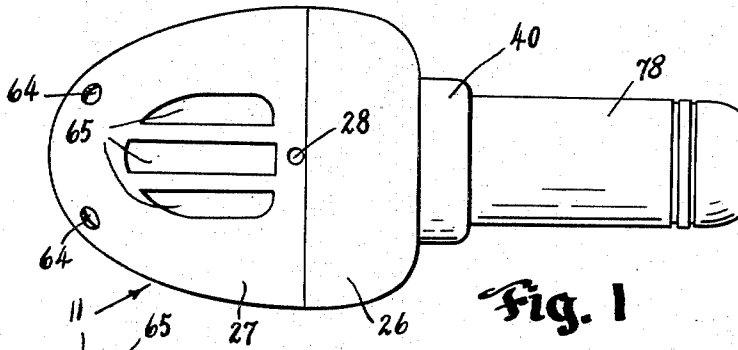


Fig. 1

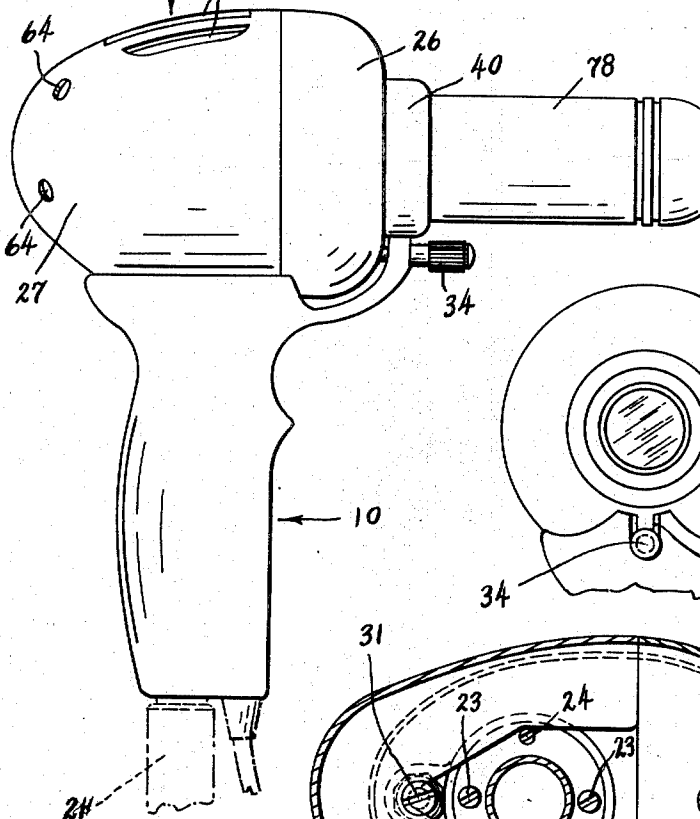


Fig. 2

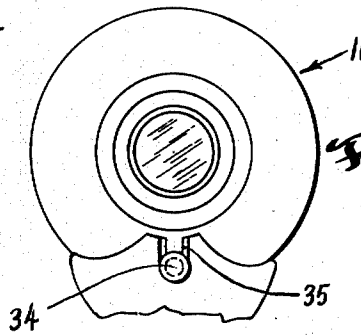


Fig. 3

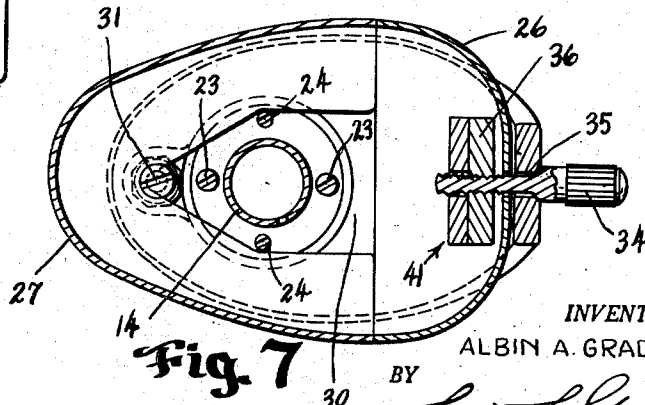


Fig. 7

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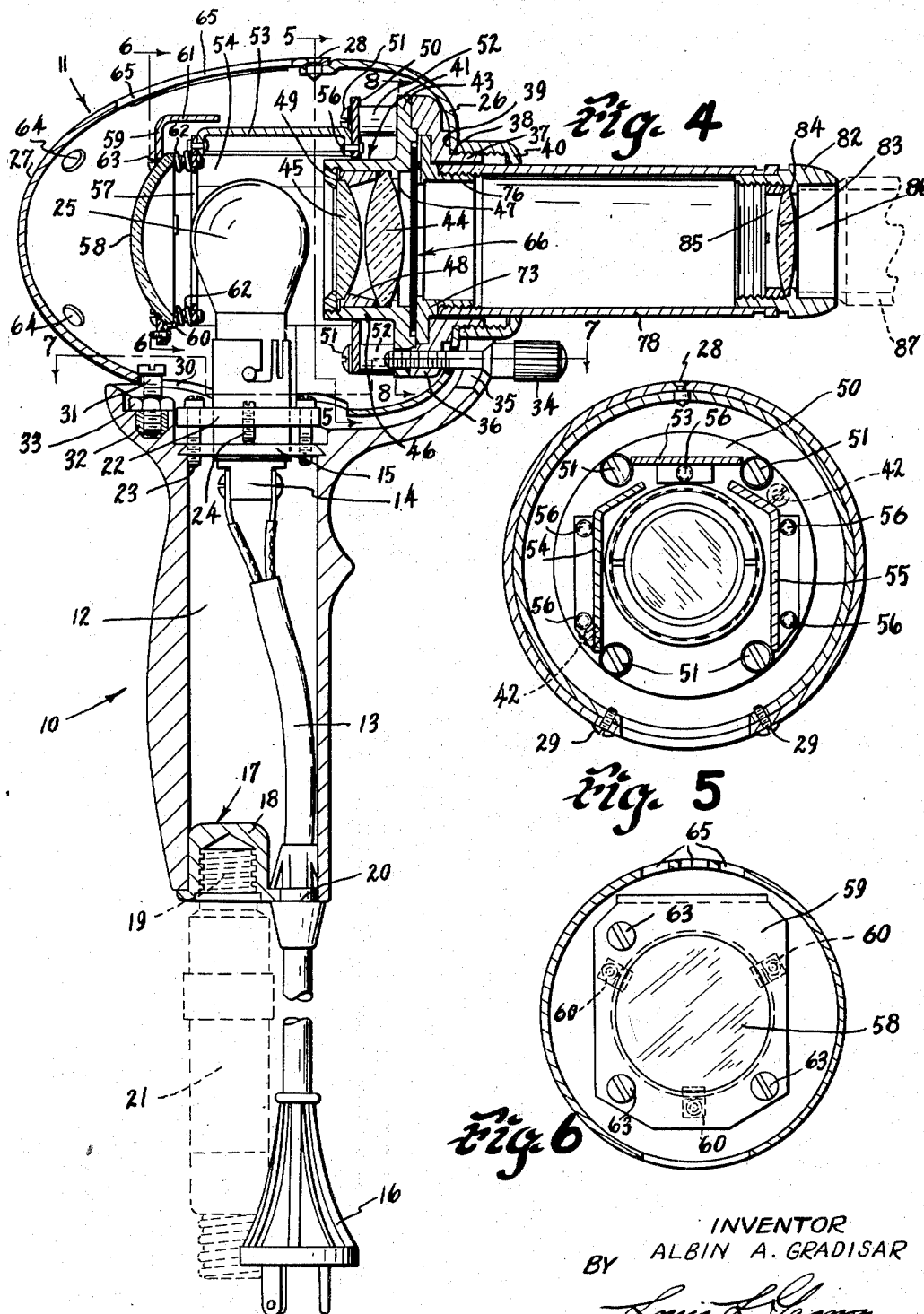
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3 Sheets-Sheet 2



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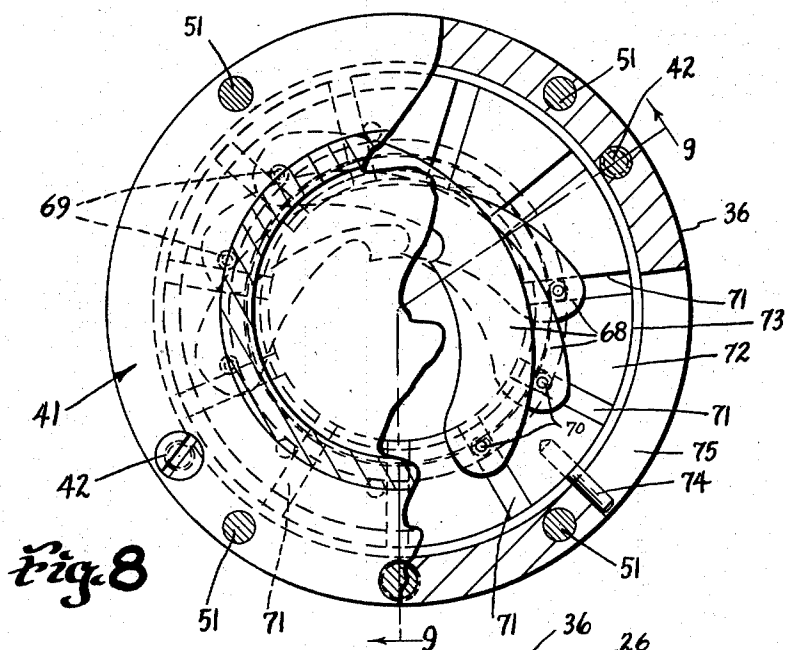
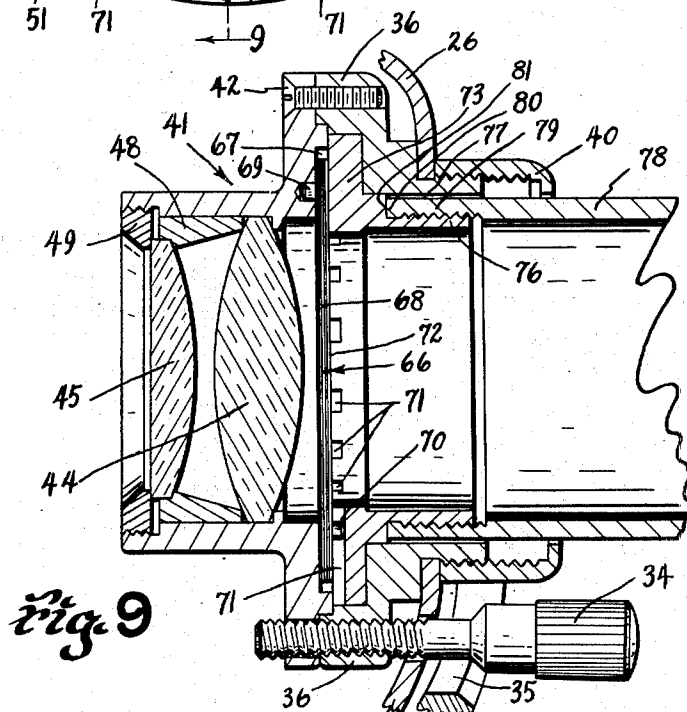
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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DIAGNOSTIC LAMP

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9 Claims. (Cl. 240—41.15)

1

This invention relates to illuminating means and has particular reference to improvements in lamps such as used for operating or diagnostic purposes.

A principal object of the invention is to provide a lamp for projecting a beam of light to aid in diagnostic examinations and surgical treatments which is compact, light in weight and which may be easily and conveniently handled.

Another object of the invention is to provide a lamp of this nature wherein the operating parts may be quickly and easily adjusted or replaced.

Another object is to provide ventilating means for a lamp of this nature.

Another object is to provide means for controlling the size of the light aperture and means externally of the lamp for actuating said means.

Still another object is to provide a lamp of this nature wherein the separate parts may be quickly and easily disassembled for cleaning or replacing.

Another object is to provide a lamp to which desired auxiliary attachments may be quickly and easily attached.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings, and it will be apparent that many changes may be made in the details of construction and arrangement of parts shown and described, without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details shown and described as the preferred form only has been given by way of illustration.

Referring to the drawings:

Fig. 1 is a top plan view of the device embodying the invention;

Fig. 2 is a side elevational view of the device shown in Fig. 1;

Fig. 3 is a partial front elevational view thereof;

Fig. 4 is a longitudinal sectional view of the device;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken on line 6—6 of Fig. 4;

Fig. 7 is a sectional view taken on line 7—7 of Fig. 4;

Fig. 8 is an enlarged partial sectional view showing the iris diaphragm assembly; and

2

Fig. 9 is a fragmentary sectional view taken as on line 9—9 of Fig. 8.

Referring more particularly to the drawings wherein like characters of reference designate like parts throughout the several views, the device embodying the invention comprises broadly a handle portion 10 and a lamp housing 11.

The handle portion 10 is preferably formed of a mouldable plastic non-heat conducting material and is shaped to form a grip which will fit comfortably in the hand of the user. The handle 10 is provided with a central bore 12 extending throughout its length, through which the wires 13, supplying the necessary electrical energy to the lamp, are adapted to extend. The wires 13 are connected to a lamp receiving socket 14 which is adjustably mounted in a metal insert 15 at the upper end of the handle 10. The opposed ends of the wires 13 are connected to a plug 16 which may be connected to any suitable source of electrical energy. A cap-like closure member 17 is located at the lower end of the handle 10 and has a portion 18 extending within the bore 12 having a threaded opening 19 therein. The closure member 17 is also provided with an opening 20 through which the wires 13 are adapted to extend. The threaded opening 19 in the closure member 17 is provided to enable the lamp to be attached to a floor stand or wall bracket, if desired. The threaded opening 19 is designed to receive the threaded end of supporting means 21, as shown in dotted lines in the drawings, formed on the floor stand or bracket.

The lamp socket or holder 14 is adjustably supported, in the opposed end of the handle 10, by the metal insert 15. The metal insert 15 is preferably positioned in the handle when said handle is moulded and is provided with a central opening through which one end of the lamp socket 14 is adapted to be positioned. This opening is larger in diameter than the diameter of the lamp socket to allow adjustment thereof. The lamp socket 14 is provided with a ring 22 which is spaced from the end thereof and is provided with four holes spaced 90° apart to receive the adjusting screws 23 and 24. The screws 23 are adapted to extend through the openings in the ring 22 and to be threaded into the metal insert 15 and the screws 24 are adapted to be threadedly connected to the ring 22 and extend therefrom with the ends bearing against the metal insert 15. With the lamp socket 14 carrying the lamp 25 mounted in this manner, it will be seen that by adjusting the push and pull screws 23 and 24 that the socket may be quickly

and easily adjusted to overcome any differences that may occur in the position of the filaments of different lamp bulbs used.

The upper portion of the handle 10, adjacent the lamp socket, is flared outwardly and slightly cupped to receive the housing member 11.

The lamp housing member 11 is formed of two sections 26 and 27 secured together by means of a locating pin 28 and the screws 29, as shown in Fig. 5, which, when in assembled relation with each other, form a hollow housing in which the lamp 25 extends.

The housing 11 is adapted to be detachably secured to the handle 10 in such a manner that it may be quickly and easily detached to allow for changing or adjusting the lamp 25 or for cleaning other associated parts. The portion 27 of the housing is provided with an opening 30, best shown in Fig. 7, which will allow the housing to fit about the lamp socket 14. The opening 30 has substantially parallel side edges extending from the front thereof to approximately the center of the lamp socket, when in assembled relation therewith, with converging edges extending rearwardly therefrom. The portion of the opening where the converging edges meet is adapted to fit about a screw 31 and beneath the head thereof, which extends from the handle 10. The screw 31 is threaded into a metal plug 32 which is pressed into anchored relation with the handle 10, and is provided with a check nut 33 whereby the head of the screw may be positioned and locked at the proper distance from the handle.

When assembling the housing 11 with the handle 10, the said housing is placed over the lamp and lamp socket with the meeting ends of the converging edges of the opening 30 of the housing portion 27 lying against the body of the screw 31 and beneath the head of said screw. The housing is secured in this position by means of a thumb screw 34 which is adapted to extend through a slot 35 in the cupped portion of the handle 10, an opening formed in the housing portion 26 and which is threaded into a threaded opening formed in a support 36 carried by the housing portion 26.

With a construction such as this it will readily be seen that when it is desired to remove the housing from the handle, the thumb screw 34 need only be loosened an amount sufficient to allow the housing to be slid back away from the screw 31, thereby permitting the housing to be lifted from the handle. This will permit the operator to adjust or change the lamp bulb or to clean the mirror or lenses in a quick and efficient manner and without disturbing any of the other associated parts.

The support 36 which is adapted to support different parts within the housing is provided with an annular threaded portion 37 which is adapted to extend through an opening 38 in the housing portion 26 and has a shoulder 39 adapted to lie against the inner wall thereof. The support 36 is secured to the housing by a threaded cap-like member 40, which is threadedly connected to the portion 37 and which when tightened will clamp the wall of the housing adjacent the opening 38 between the shoulder 39 and said cap-like member 40.

A lens mount 41 is secured to the support 36 by the screws 42, shown in Fig. 5, which extend through the flange 43. The condenser lenses 44 and 45 are positioned within the tube-like portion 46 of the lens mount 41. The horizontal center line of the tube-like portion 46 of the lens

mount is adapted to be aligned with the center line of the opening 38 of the housing portion 26. The condenser lens 44 is adapted to lie against the seat 47 located internally of the tube-like portion 46, a spacer member 48 is then positioned against the lens 44 and is provided with a seat against which the lens 45 is placed. The lenses are secured within the tube-like portion 46 by a threaded ring 49 which is threadedly connected therewith. If desired, the lens 45 may be formed of iron containing glass of any known type for absorbing the infra-red or heat rays.

A supporting ring 50, adapted to fit about the tube-like portion 46 of the lens mount 41, is attached to the flange 43 of the lens mount by screws 51 and is held in spaced relation therewith by insulating bushings 52, which may be formed of any suitable material such as asbestos, fibre or the like.

Heat shielding members 53, 54, and 55 are secured to the supporting ring 50 by means of the rivets 56. These members are adapted to lie between the lamp bulb and the walls of the housing and will provide an air space therebetween so that the outer walls of said housing will not be subjected to the direct heat emanating from the lamp.

Secured to the rear of the heat shielding members 53, 54 and 55 is a plate-like member 57 having an opening in alignment with the lamp and the projecting lens, which is adapted to support a light reflecting mirror 58. The light reflecting mirror 58 is mounted in a plate-like member 59 by means of the clips 60. The plate-like member 59 which is adapted to be spaced from the member 57, has a flange portion 61 adapted to extend over the upper heat shielding member 53, thereby shunting the light from between the members 57 and 59 while allowing air to circulate there-through.

The mirror supporting plate 59 carrying the mirror 58 is adjustably connected to the member 57 by means of the springs 62 and the adjusting screws 63. With a construction of this nature, it will be seen that the reflecting mirror may be quickly and easily adjusted to reflect the light rays emanating from the lamp bulb to the projection lens system. The housing portion 27 is provided with suitable openings 64 in substantial alignment with the adjusting screws 63 so that a screw driver may be inserted to adjust the screws, thereby providing means whereby the light reflecting mirror may be readily adjusted without removing the housing.

Suitable ventilation openings 65 are provided in the housing portion 27 through which cool air may circulate in the housing.

From the foregoing description and from the drawings, particularly Fig. 4, it will be seen that the outer housing will be kept comparatively cool and may be handled by the operator without discomfort. This is due to the particular arrangement of parts whereby the lamp bulb is enclosed on all sides except the bottom thereby forming an air pocket about the lamp which will receive cool air from the opening 30 in the bottom of the housing.

An iris diaphragm 66 positioned within a recess 67 in the lens mount 41 is provided for varying the size of the beam of light projected. The iris diaphragm 66 is composed of a plurality of leaves 68 which lie in overlapping relation with each other, with one end of each leaf pivotally secured to the lens mount 41 by means of pins or the like 69. The opposed ends of the leaves 68 are pro-

vided with pins 70 which are adapted to slidably seat in the slideways or slots 71 formed in the face 72 of the iris actuating ring 73.

The iris actuating ring 73 is rotatably mounted in the support 36, with the rotation of said ring being limited to an amount sufficient to allow the iris to be adjusted to the desired size. The rotation of the ring 73 is limited through the provision of a pin 74 which extends from said ring into a cutout portion 75 formed in the support 36.

The iris actuating ring 73 is provided with a threaded extension 76 which is adapted to lie within the opening 77 of the support 36. A lens tube 78 having a threaded end 79 is adapted to be threadedly connected to the extension 76 with the end 80 thereof abutting a shoulder 81 on the ring 73. It will thus be seen that when the lens tube 78 is rotated, it will cause the iris actuating ring 73 to also rotate thereby actuating the iris.

To disconnect the lens tube 78, the said tube is adapted to be rotated until the pin 74 in the actuating ring 73 has reached the end of the cutout portion 75 in the support 36 thereby stopping the rotation of the actuating ring so that further rotation of the lens tube will disconnect the said tube. The opposed end of the lens tube 78 is provided with a threaded portion to which a lens holder 82 is threadedly connected. A projection lens 83 is supported in the lens holder 82 against the shoulder 84 by a threaded ring 85. The outer end of the lens holder 82 is provided with a counter bored portion 86 which is adapted to receive and hold, in frictional connection therewith, an auxiliary lens holder 87 which may be used with the device.

From the foregoing description, it will be seen that simple, efficient and economical means have been provided for accomplishing all the objects and advantages of the invention.

Having described my invention, I claim:

1. A device of the character described comprising a handle, a housing supported by said handle, said handle having a source of illumination mounted thereon and disposed within said housing, light reflecting means adjustably mounted in said housing adjacent the illumination means, means for adjusting said light reflecting means, a light projecting lens system carried by said housing in substantially axial alignment with the light reflecting means, a light projecting tube carried by said housing axially aligned with the lens system and an iris diaphragm mounted in the housing between the light projecting lens system and the light projecting tube.

2. A device of the character described embodying a handle member and a housing supported by said handle, said handle having a source of illumination adjustably mounted therein, light reflecting means adjustably mounted adjacent the illumination means, said housing having a light projecting lens system mounted therein in substantially axial alignment with the light reflecting means, a light projecting tube rotatably mounted on said housing, and an iris diaphragm mounted in the housing between the light projecting lens system and the light projecting tube, said diaphragm being operably connected with said tube so as to be adjustable by rotation of said tube, and with the housing being separable from the handle as a unit.

3. A device of the character described embodying a handle member and a housing supported by said handle, said handle having a source of illumination adjustably mounted therein and said source of illumination being disposed in said

housing, heat shielding members between the source of illumination and the housing, light reflecting means adjustably supported by the housing adjacent the illumination means, a light projecting lens system carried by the housing in substantially axial alignment with the light reflecting means, and a light projecting tube rotatably mounted on said housing forwardly of the lens system, a second light projecting lens carried by said tube and an iris diaphragm mounted in the housing between the first light projecting lens system and the light projecting tube and operably connected with said tube so as to be adjustable by rotation of the tube.

4. A device of the character described comprising a handle member, a housing member supported by said handle with the adjacent portions of said handle and housing being in spaced relation with each other, said handle and housing members having detachable interconnecting portions, clamping means for securing said interconnecting portions together, a source of illumination adjustably mounted on said handle and lying within said housing when the handle and housing are assembled, means for adjusting the position of the source of illumination in the housing, light reflecting means supported by the housing adjacent the source of illumination, means for adjusting the light reflecting means relative to the source of illumination and to the housing, a light projecting lens system carried by the housing in substantial alignment with the light reflecting means and said source of illumination, a light projecting tube rotatably supported by said housing, a second light projecting lens mounted in said tube and an iris diaphragm mounted within said housing between the first light projecting lens system and the light projecting tube and being so associated with the tube as to be adjustable by rotation of said tube.

5. A light projecting device comprising a support having a seat thereon for an illuminating member, and a housing adapted to be positioned on said support, said housing embodying a wall portion shaped to surround the illuminating member and having a light focusing tube portion on one side thereof, said housing supporting a reflector and light condensing lens means interiorly thereof and in axial alignment with the focusing tube portion, said reflector and lens means being arranged to lie on opposed sides of the illuminating member when said illuminating member is positioned in the housing, and with the lens means being disposed on the side thereof toward the focusing tube, said housing having an apertured portion in the underwall portion thereof intermediate the reflector and lens means, said apertured portion being of a size and shape to permit the illuminating member when supported on said seat of the support to be positioned therethrough and into the interior of the housing between the reflector and lens means, and securing means for detachably maintaining said housing on the support whereby the housing may be readily attached and detached from the support without disturbing the position of the illuminating member on the support and the disposition of the reflector, lens means and focusing tube on the housing.

6. A light projecting device comprising a support having a seat thereon for an illuminating member, and a housing adapted to be positioned on said support, said housing embodying a wall portion shaped to surround the illuminating member and having a light focusing tube portion on

one side thereof, said housing supporting a reflector and light condensing lens means interiorly thereof and in axial alignment with the focusing tube portion, said reflector and lens means being arranged to lie on opposed sides of the illuminating member when said illuminating member is positioned in the housing, and with the lens means being disposed on the side thereof toward the focusing tube, said housing having an apertured portion in the underwall portion thereof intermediate the reflector and lens means, said apertured portion being of a size and shape to permit the illuminating member when supported on said seat of the support to be positioned therethrough and into the interior of the housing between the reflector and lens means, and catch means on said support adjacent the seat for the illuminating member, said catch means having a portion to overlyingly engage a lip of said apertured portion, and locking means for detachably maintaining said portion of the catch means in engaged relation with said lip whereby the housing may be readily attached and detached from the support without disturbing the position of the illuminating member on the support and the disposition of the reflector, lens means and focusing tube on the housing.

7. A light projecting device comprising a support having a seat thereon for an illuminating member, and a housing adapted to be positioned on said support, said housing embodying a wall portion shaped to surround the illuminating member and having a light focusing tube rotatably mounted on one side thereof, said housing supporting a reflector and a condensing lens system interiorly thereof and in axial alignment with the focusing tube, said reflector and lens system being arranged to lie on opposite sides of the illuminating member when said illuminating member is positioned in the housing, the condensing lens system being disposed on the side toward the focusing tube, and an iris diaphragm disposed between the lens system and the inner end of the rotatable tube, said iris diaphragm embodying a plurality of overlapping leaves arranged to permit by their adjustment a change in the size of the central aperture therethrough so as to vary the size of the beam of light projectable from the tube, and means operable by rotation of the focusing tube for adjusting the arrangement of said leaves to control the size of said opening in the iris diaphragm, said housing being provided with an apertured portion in the lower wall portion thereof intermediate the reflector and lens system, said apertured portion being of a size and shape to permit the illuminating member when supported on said seat of the support to enter therethrough into the interior of the housing between the reflector and lens system, and securing means for detachably maintaining said housing in position about the illuminating member and on the support.

8. A light projecting device comprising a support having a seat thereon for an illuminating member, and a housing adapted to be positioned on said support, said housing embodying a wall portion shaped to surround the illuminating member and having a light focusing tube portion on one side thereof, said housing supporting a reflector and a condensing lens system interiorly thereof and in spaced relation to said wall portion, said reflector and lens system being arranged to lie on opposed sides of the illuminating member in axial alignment with the focusing tube portion, when said illuminating member is positioned

in the housing, the condensing lens system being disposed on the side thereof toward the focusing tube, and heat shielding members disposed to overlie the top and sides of the illuminating member between the reflector and the lens system in spaced relation to said wall of the housing to provide with the reflector and lens system a baffle for heat emitted by the illuminating member, said housing having an apertured portion on the underwall thereof communicating with the interior formed by said reflector and lens system with the heat deflecting member, said apertured portion being of a size and shape to permit the entrance of the illuminating member when supported on said seat of the support interiorly of the said chamber, and catch means on said support adjacent the seat for the illuminating member, said catch means having a portion to overlyingly engage a lip of said apertured portion for detachably securing said housing with the support whereby the housing may be readily attached and detached from the support without disturbing the position of the illuminating member on the support and the disposition of the reflector, lens system, heat shielding members and focusing tube on the housing.

9. A light projecting device comprising a support having a seat thereon for an illuminating member, and a housing adapted to be positioned on said support, said housing embodying a wall portion shaped to surround the illuminating member and having a light focusing tube portion on one side thereof, said housing having a reflector adjustably mounted interiorly thereof and on the side thereof opposed to the focusing tube portion, said housing having light projecting lens means disposed intermediate the reflector and the focusing tube portion, said reflector and lens means being spaced to permit the positioning of an illuminating member therebetween, and the wall portion of said housing having an apertured portion of a size and shape to permit said illuminating member when supported on said seat of the support to enter therethrough into said position interiorly of the support to enter therethrough into said position interiorly of the housing between the reflector and lens means, and catch means on said support adjacent the seat for the illuminating member, said catch means having a portion to overlyingly engage a lip of said apertured portion, and locking means for detachably maintaining said portion of the catch means in engaged relation with said lip whereby the housing may be readily attached and detached from the support without disturbing the position of the illuminating member on the support and the disposition of the reflector, lens system and focusing tube on the housing.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,263,234	Hanson	Apr. 16, 1918
1,646,557	Pieper	Oct. 25, 1927
1,701,193	Rolfes	Feb. 5, 1929
1,779,997	Angell	Oct. 28, 1930
1,927,222	Shannon	Sept. 19, 1933
2,038,514	Hummert	Apr. 21, 1936
2,224,225	Holroyd	Dec. 10, 1940
2,396,998	Garstang et al.	Mar. 19, 1946