Dec. 12, 1972 W. M. EIKENBERRY 3,706,070

VEHICULAR TRAFFIC CONTROL SIGNAL AND GASKET

Filed Nov. 9, 1970 3 Sheets-Sheet 1

FIG. 1

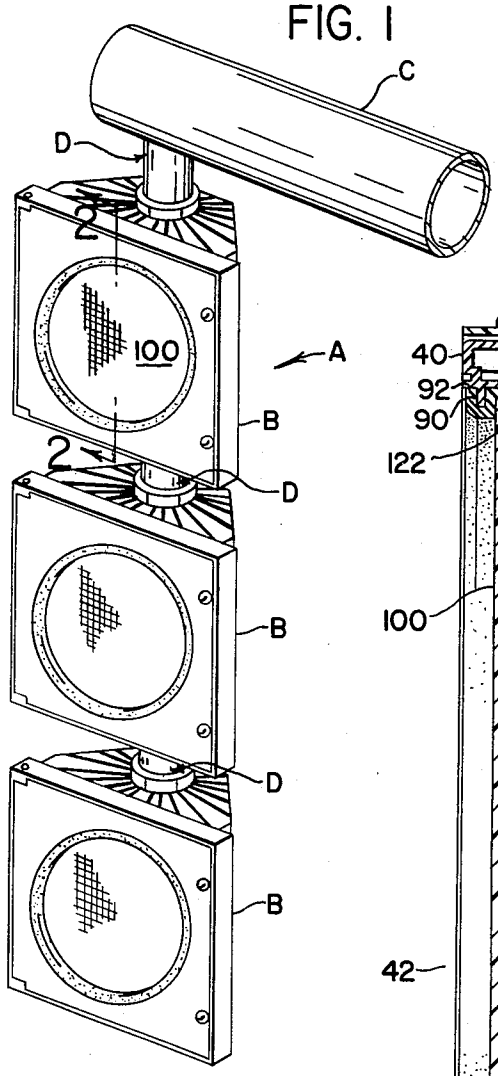


FIG. 2

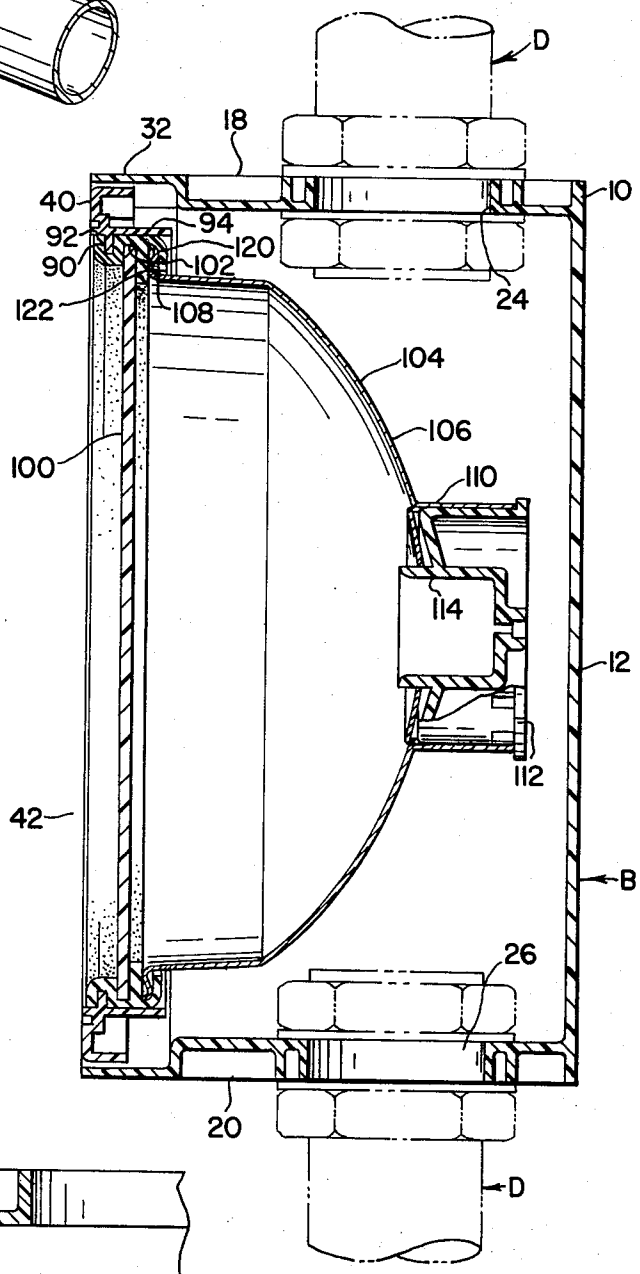
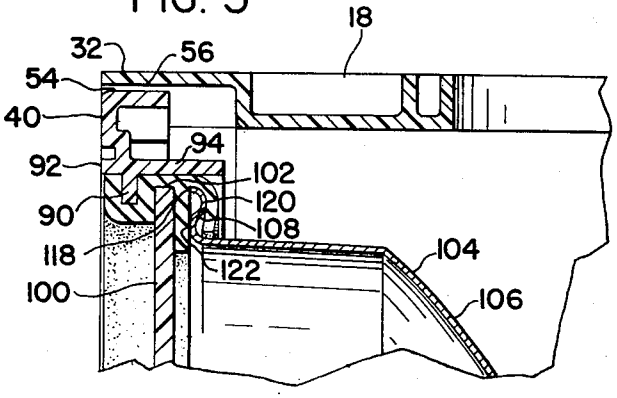


FIG. 3



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FIG. 4

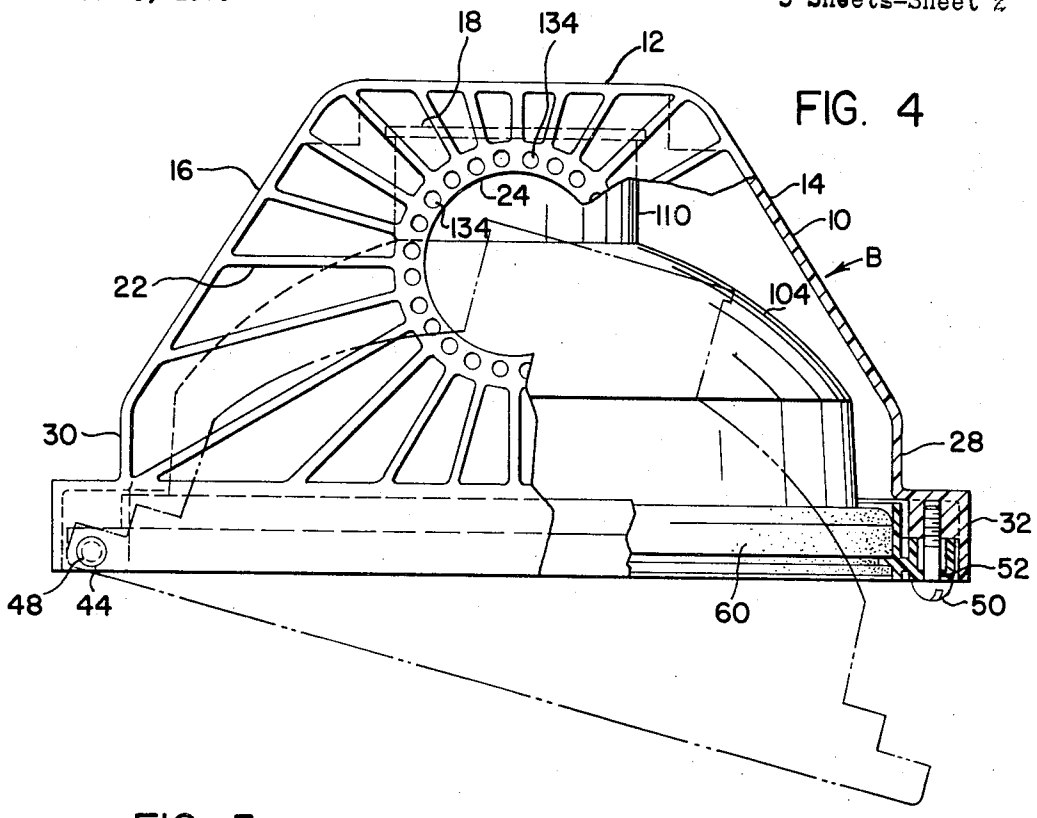
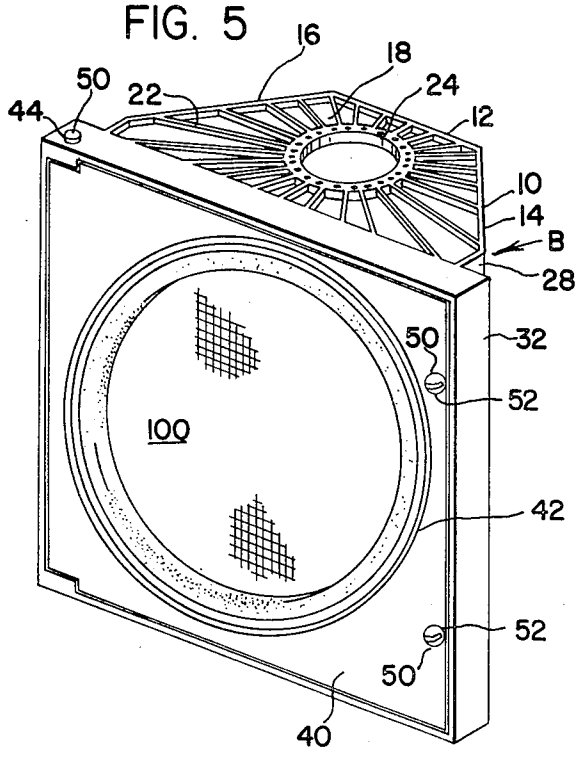


FIG. 5



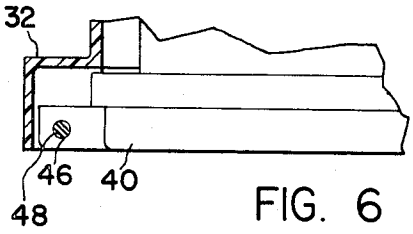


FIG. 6

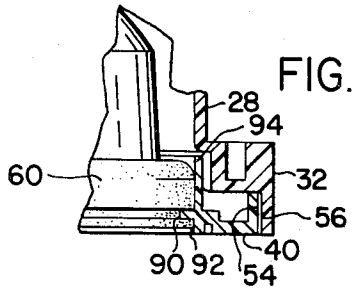


FIG. 7

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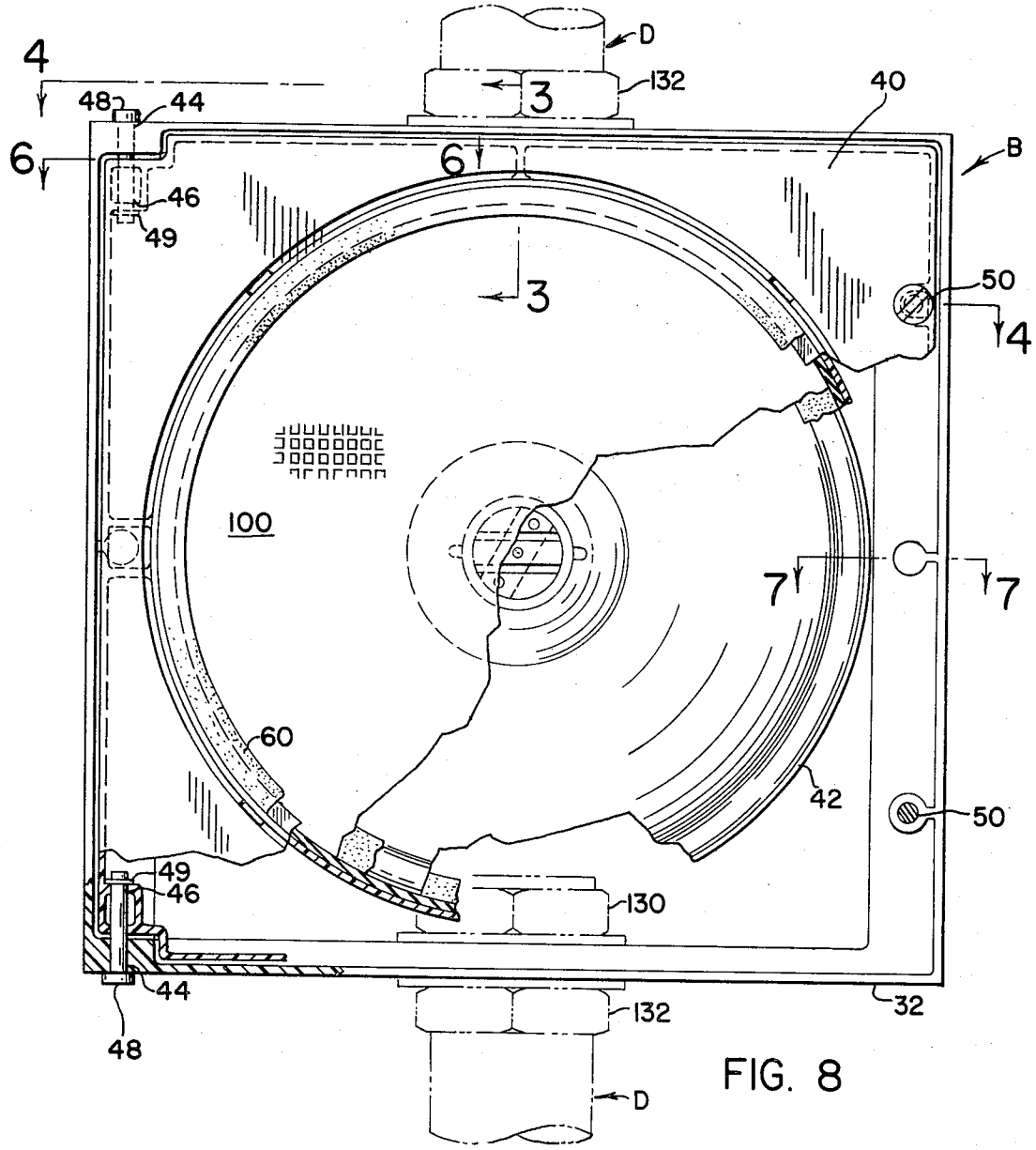


FIG. 8

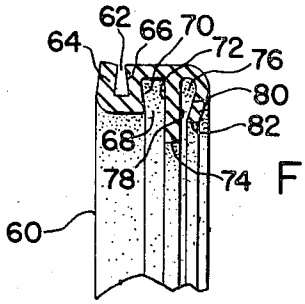


FIG. 9

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3,706,070

Patented Dec. 12, 1972

3,706,070

VEHICULAR TRAFFIC CONTROL SIGNAL AND GASKET

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Filed Nov. 9, 1970, Ser. No. 88,054

Int. Cl. G08b 5/36

U.S. Cl. 340—119 R 8 Claims

ABSTRACT OF THE DISCLOSURE

A light assembly particularly adapated for use as a traffic control signal having a molded plastic assembly housing with at least one open end area. A molded plastic end cover door is pivotally mounted to one side of the open end area in order that it might be arcuately swung into and out of a covering relationship with the open end. The cover door includes therein a generally circular light component receiving area therein. A resilient gasket member which includes a plurality of circumferentially extending component receiving grooves is received on the receiving area to extend therearound. A light diffusing lens and a light reflector associated with a light source are resiliently received in clamping engagement by one of the receiving grooves such that they are disposed in a desired relationship with the cover door.

This application pertains to the art of the light fixtures and more particularly to a traffic control signal.

The invention is particularly applicable for application where it is desired to direct vehicular or pedestrian traffic flow at an intersection through the use of a plurality of multi-colored lights by combining a plurality of signals into a coordinated light module and will be described with particular reference thereto, however; it will be appreciated that the invention has broader appreciations and may be used in any environment where it is desired to have a lightweight light source enclosure which is easily accessible for repair and replacement purposes as well as being adaptable for mounting in combination with other such light signals.

Various traffic control signal designs are well known in the art and have heretofore generally comprised a plurality of separate and distinct components individually held in a predetermined desired position relative to the other components. The main components, namely, the open ended signal housing and the open end cover door were cast from metal and therefore were rather heavy. The individual mounting of the remaining signal components to the housing or cover door were such that additional weight was added to make signal handling and mounting difficult. An even more acute problem was the means by which the individual components were held in place. Extra brackets, clasps and retainers were necessarily utilized and because of the individual component mounting, the housings were found not to be weathertight. Therefore, the elements of nature were permitted to act against the delicate internal components to cause rusting and deterioration thereof. Also, it was necessary to frequently repaint the signals in order to prevent even faster deterioration.

When these previous light signals were utilized at intersection areas, it was extremely difficult for one man to be able to provide service therefor in that it was virtually impossible for him to manage all the parts. Further, with the advert of more difficult traffic control problem, it has been necessary that additional signal light, besides the most commonly utilized three-light modules be added in order to provide the necessary traffic control information. The additional signals included such things

as for example, right and left turn information. Since these prior traffic signals were made of metal, the addition of more signals added considerable weight to the overall module so that the standard intersection mountings, that is, cable or boom mountings, were inadequate.

Some attempts to overcome these problems resulted in signal light structures wherein certain of the internal light components were affixed to form subassemblies to overcome the difficulty in providing maintenance service as well as the previously encountered weathertight problems. However, in almost all instances, these signal light have utilized a rather complex gasket member between the signal housing and the housing cover door. Each time access is desired into the internal portion of the signal, it is necessary to disturb this rather complex gasket. As a result, and after several openings, the gaskets become worn or no longer fit properly so that it becomes necessary to replace them. Further still, the weight problems previously incurred have not been overcome.

The present invention contemplates a new and improved traffic control signal structure which overcomes all of the above referred problems and others generally associated therewith and provides a traffic control signal which is relatively simple in design, lightweight, weatherproof, and more easily accessible for maintenance purposes.

In accordance with the present invention there is provided an enclosed signal light assembly having a housing structure which defines a light component chamber area having at least one open wall area. A cover door for the open wall area is pivotally mounted to one side of the housing and includes a component receiving area in the surface thereof. A resilient gasket member is disposed about the inner periphery of the receiving area in a sealing relationship therewith and includes component retaining grooves around the inner periphery. A light diffusing lens, generally dimensionally coextensive with the component receiving area, and a light reflector which includes means for mounting a light source and which is also generally dimensionally coextensive with the receiving area, are received in the internal grooves of the gasket member.

In accordance with a more limited aspect of the present invention, a new gasket design for clampingly maintaining signal light components in position relative to a receiving area in a signal light housing door is provided.

The principal object of the invention is the provision of a new traffic control signal design in which the internal signal light components are removably mounted to the signal housing door.

Another object of the present invention is the provision of a traffic control signal havnig decreased weight.

Another object of the present invention is the provision of a traffic control signal which is weathertight.

Still another object of the present invention is the provision of a traffic control signal which includes provisions for ease of access into the signal housing chamber to perform necessary maintenance functions.

Yet another object of the present invention is the provision of a resilient gasket member for mounting the internal signal components to the signal housing door.

The invention may take physical form in certain parts and arrangements of parts, a preferred embodiment of which will be described in detail in this specification and illustrated in the accompanying drawings which form a part hereof and wherein:

FIG. 1 shows a traffic signal module utilizing the individual traffic signals of the present invention;

FIG. 2 is a cross-sectional view of one of the signals shown in FIG. 1 along line 2—2;

FIG. 3 is an enlarged cross-sectional segment of the view in FIG. 8 taken along line 3—3;

FIG. 4 is a partial top view and cross-sectional view of the signal shown in FIG. 8 taken along lines 4—4;

FIG. 5 is an enlarged perpsective view of one of the signal units shown in FIG. 1;

FIG. 6 is a partial cross-sectional view of the signal shown in FIG. 8 taken along lines 6—6;

FIG. 7 is a partial cross-sectional view of the signal shown in FIG. 8 taken along lines 7—7;

FIG. 8 is a front view of the signal of the subject invention with a portion of the cover door and light diffusing lens removed for ease of illustration; and,

FIG. 9 is a cross-sectional view of the component mounting gasket member.

Referring now to the drawings wherein the showings are for the purposes of illustrating the preferred embodiment of the invention only and not for purposes of limiting same, FIG. 1 shows the traffic control signal of this invention in one of several alternative environments. FIG. 1 shows a traffic control module A comprised of three individual interconnected traffic control signals which form a part of this invention. Traffic control signals B are mounted to be suspended from traffic control module boom C which may be mounted to a standard (not shown) at one side of a traffic intersection. Signal connectors D which do not form a part of the present invention are included to interconnect the individual traffic control signals B from boom C and each other. The control module of FIG. 1 may then include the standard multi-colored lights which are customarily used in vehicular traffic control.

More specifically and with reference in particular to FIGS. 2, 4, 5 and 8, it will be seen that each traffic control signal B includes a signal housing generally designated **10**. The signal housings each include rear wall **12**, sidewall portions **14, 16**, housing top **18** and housing bottom **20**. It is to be understood that in the preferred embodiment of the present invention housing **10** is injection molded of polycarbonate plastic so that the desired color scheme is integrally molded therewith. It will be appreciated by this skilled in the art that other materials will be acceptable. Housing top **18** and housing bottom **20** further include reinforcing ribs **22** which act to provide stability for the overall housing structure. Housing top **18** includes top wiring and mounting opening **24** and housing bottom **20** includes bottom wiring and mounting opening **26**. Openings **24, 26** are generally circular in peripheral configuration and sidewall portions **14, 16** include side portion extensions **28, 30** respectively. As can best be seen in FIG. 5, reinforcing members **22** extend from openings **24, 26** outwardly to and terminating at junctions with rearwall **12**, sidewall portions **14, 16** and sidewall portion extensions **28, 30**. Extending around the open end of the housing periphery and integral with housing top **18**, housing bottom **20** and side portion extensions **28, 30** is a signal housing door receiving flange generally designated **32**.

The signal housing door is generally designated **40** and is injection molded from polycarbonate plastic to whatever color is desired and also includes component receiving area **42**. It will again be understood by those skilled in the art that other satifactory materials could be utilized in manufacturing the housing door. Housing **10** includes housing mounting holes **44** and door **40** includes door mounting holes **46**. Mounting pins **48** pass through holes **44, 46** to maintain the door in a desired relationship with housing **10**. At the outer ends of mounting pins **48** there is received a retaining lock washer **49**. Standard elongated screws and mating nuts could be substituted for mounting pins **48** and retaining washers **49**. On the opposite side of this pivotal door mounting there is provided a plurality of door closing screws **50** passing through associated closing screw recesses **52** and into closing engagement with signal housing door receiving flange **32**. This arrangement permits door **40** to be moved from a locked position where it covers the open end area of signal housing **10** arcuately outward in order that access may be had to the inside portion of the housing. As best shown in FIGS. 3 and 7, housing door **40** includes an outer flange portion **54** mated to inner portion **56** of signal housing door receiving flange **32**. These mating portions extend circumferentially around flange **32** and door **40** to provide a weathertight seal between the two.

FIG. 9 best shows a cross-sectional view of a portion of the resilient gasket member generally designated **60**. The gasket includes a first receiving groove **62**, resilient sidewalls **64, 66** second receiving groove **68**, resilient sidewalls **70, 72**, sealing lips **74**, third receiving groove **76**, resilient sidewalls **78, 80** and sealing lip **82**. It should be noted that sidewalls **64, 66** extend outwardly towards each other from the base of first receiving groove **62**, that resilient sidewall portion **70** extends towards lip **74** from the base of second receiving groove **68** and that resilient sidewall **80** extends towards sealing lip **74** from the base of third receiving groove **76**. It is to be understood that when these resilient sidewalls are deformed to extend generally parallel with each other as when the light structure components are inserted in receiving grooves **62, 68** and **76**, they supply a circumferential resilient clamping force to aid in maintaining the components in position. This action is more particularly shown in FIGS. 2 and 3.

Referring now to FIGS. 2, 3 and 7, it will be seen that signal housing door **40** includes, at component receiving area **42**, additional surfaces to aid in sealingly receiving gasket member **60**. These surfaces include an inwardly directed circumferentially extending male flange **90**, front sealing flange **92** and rear sealing flange **94**. To install gasket member **60** onto door **40**, the gasket is temporarily hand deformed and placed around component receiving area **42** so that first receiving groove **62** is received on inwardly extending male flange **90**. Sealing flanges **92, 94** then abut the top edge of resilient sidewall **64** and the edge of gasket member **60** opposite second receiving groove **68** and third receiving groove **76** to form a sealing relationship.

A light diffusing lens generally designated **100**, which includes an outer peripheral edge surface **102**, may then be installed in second receiving groove **68** by deforming sealing lip **74**, third receiving groove **76**, resilient sidewalls **78, 80** and sealing lip **82** until the outer peripheral surface **102** is receivable in groove **68**. It will be understood that lens **100** may be glass or molded plastic and be of the type generally associated for diffusing light in the traffic signal art.

The assembly also includes a light deflector generally designated **104**. Deflector **104** includes a generally bell-shaped deflector body **106**, circumferentially extending sealing and engaging lip **108** and light source receiving sleeve **110**. As can best be seen in FIGS. 2 and 3, sealing and engaging lip **108** has a cross-sectional configuration the shape of a reversed "S" and includes bend portions **120, 122**. Sleeve **110** is adapted to receive light source holder **112** having socket **114** which in turn receives light source (not shown) itself. It is to be understood that holder **112**, socket **114** and the light source may be of the type generally associated with the traffic control signal art adapted to be received in sleeve **110**. To install light deflector **104** into resilient clamping engagement with gasket **60**, it is merely necessary to temporarily outwardly deform resilient sidewall **80** of sealing lip **82** until sealing and engaging lip **108** is received in third receiving groove **76**.

With this installation, it may be seen that the light assembly components are all affixed relative to door **40**. Again, reference is made to FIGS. 2 and 3 showing the components in place and that resilient walls **64, 66; 70, 72**; and **78, 80** have all been resiliently displaced so that they are essentially parallel with each other. The added length of sealing lip **74** provides an increased support area

circumferentially extending around the back of lens **100** in order to provide additional support from forces, such as from rain and wind, which may be applied from outside the structure. FIG. 4 in particular shows the location of the door and light assembly components by dashed lines when they are in place in the locked position. Also, FIG. 4 shows by phantom lines the door and light components when they are arcuately swung out of association with housing **10** on the pivotal mountings. It will be appreciated that when the signal unit of this invention is mounted above an intersection area, the arcuate movement will permit a workman to open the signal housing and have ready access to both the signal light components and the signal housing itself. For repair or replacement of the light source or its holder **112**, it is merely necessary to only withdraw holder **112** from receiving sleeve **110**. Once the repair or replacement is made, it may be easily reinserted into the sleeve. Likewise, if it is necessary to repair or replace light deflector **104**, it is merely necessary to temporarily deform resilient sealing lip **82** and resilient sidewall portion **80** until the light deflector is free of clamping engagement with third receiving groove **76**. In like manner, a diffusing lens **100** may be removed for repair or replacement from groove **68**.

By injection molding housing **10** and door **40** of polycarbonate plastic, several benefits are derived. First, the desired coloring of the housing and door is accomplished by pigmentation of the raw molding material. This integral coloration eliminates the need for subsequent repaintings. Second, elongation of molded polycarbonate prior to break is in excess of 90% compared to elongation of die cast aluminum prior to break at 1% to 3%. This factor substantially reduces indication failures caused by accident and vandalism. Thirdly, the density of molded polycarbonate is .043 pound per cubic inch compared to .098 pound per cubic inch for die cast aluminum. This weight reduction permits updating existing intersection controllers by permitting additional signals to be added to already existing controllers without substantially increasing the load on suspension facilities.

Referring to FIGS. 1 and 8, it will be seen that signal connectors D may be made from tubing of any desired short lengths which are affixed to the individual traffic control signals B in any convenient manner. One manner is to thread the connectors D and include an inside nut **130** and an outside nut **132** for each end thereof, nuts **130, 132** having an overall diameter larger than the diameter of openings **24, 26** so that the nuts may be tightened against opposite sides of those openings to provide a clamp like mounting. As shown in FIG. 4, a plurality of integrally molded protrusions **134** may be included around the circumference of openings **24, 26** in order to provide a frictional gripping action between themselves and nuts **130, 132**. The necessary electrical wiring may then be passed through the light standard and module boom, or in a cable suspension type of mounting, along one of the mounting cables, into and through signal connectors D to light source sockets **114** for each signal in the module. Additional control signals B may then be added to the module as required to update traffic control requirements.

The invention has been described with reference to the preferred embodiment. Obviously, modifications and alterations will occur to others upon the reading and understanding of this specification. It is my intention to include all such modifications and alterations in so far as they come within the scope of the appended claims or the equivalence thereof.

Having thus described my invention, I claim:

1. An enclosed light assembly particularly adapted for use as a traffic light, said assembly comprising:

a housing structure defining a signal light component retaining chamber having at least one open end;

a cover for said open end, said cover including a light component receiving area in the surface thereof;

a gasket member disposed about the inner periphery of said component receiving area and in sealing relationship therewith, said gasket including a plurality of component locating and mounting areas in the periphery thereof for mounting said member to said cover and for receiving said signal light components;

a lens generally dimensionally coextensive with said area received in sealing engagement with one of said plurality of component locating and mounting areas;

a light deflector including an open end generally dimensionally coextensive with said area and received in sealing engagement with another of said plurality of component locating and mounting areas; and,

means for supporting a light source in deflecting relationship with said deflector.

2. The light assembly as defined in claim **1** wherein said cover is pivotally mounted on one side to said housing for arcuate movement into and out of engagement with said open end and said component receiving area is generally circular.

3. The light assembly as defined in claim **2** wherein said plurality of locating and mounting areas comprise first, second and third circumferentially extending receiving grooves, said first groove disposed about the outer periphery of said member for location of said member relative to said component receiving area and said second and third grooves disposed about the inner periphery of said member for resilient clamping receipt of said lens and said deflector.

4. The light assembly defined in claim **1** wherein said means for supporting comprises a light source receiving recess in the end of said deflector remote from said open end.

5. The light assembly as defined in claim **2** wherein said housing and said covering are molded from polycarbonate plastic.

6. In a signal light device of the type having a housing structure defining a chamber area having at least one open wall area, a cover for said open wall including a signal light component receiving area and signal light components including a lens, a light deflector and a light source, the improvement comprising:

mounting said signal light components in a removable spaced relationship relative to said component receiving area and to each other by means of a resilient gasket member including a first receiving groove extending peripherally therearound adapted to be received by said component receiving area, said member furher including at least one component locating and mounting area comprising at least one second receiving groove extending around the inner peripheral surface thereof.

7. The improvement as defined in claim **6** wherein said receiving area and said gasket member are generally cylindrical and said first and second receiving grooves extend circumferentially about said member.

8. The improvement as defined in claim **7** wherein said at least one second receiving groove comprises two said second receiving grooves adjacent one another, one of said second grooves receiving said lens and the other of said grooves receiving said light deflector.

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U.S. Cl. X.R.

340—114 R, 117 R