March 10, 1936. S. M. DOVER 2,033,692

SIGNAL LAMP UNIT

Filed Feb. 4, 1935

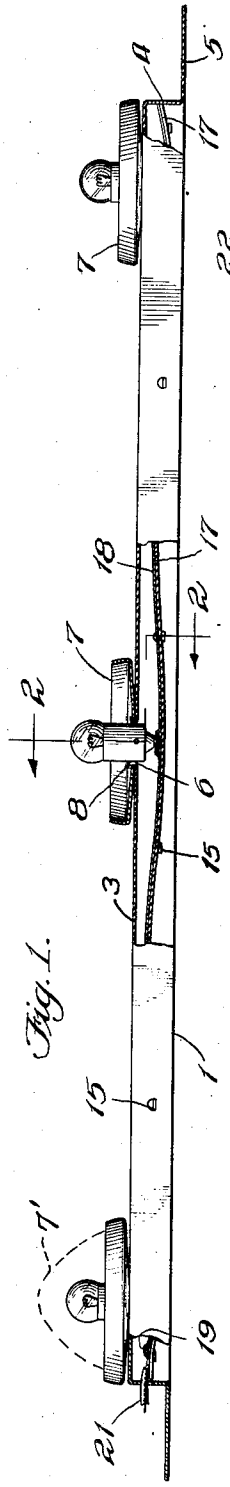


Fig. 1.

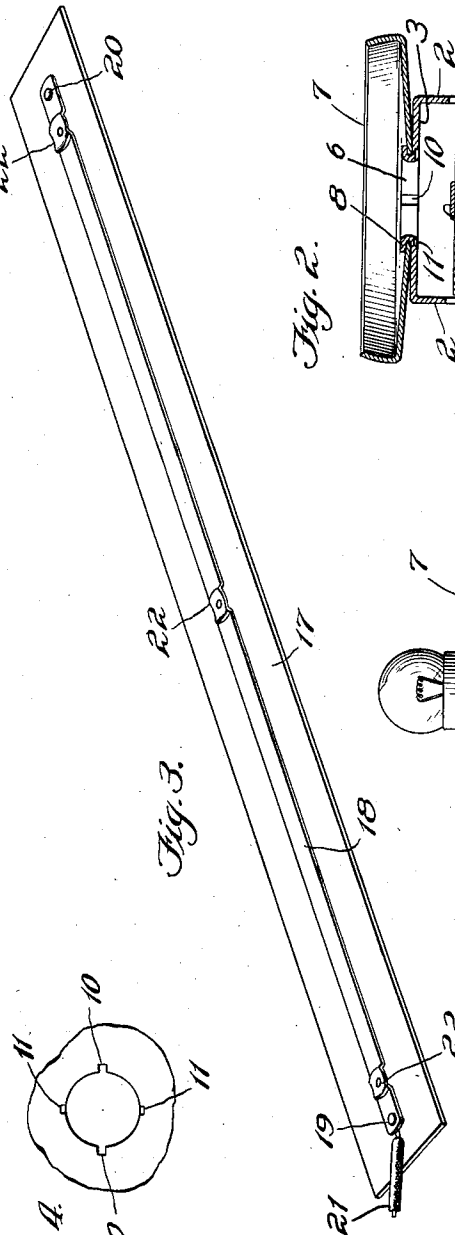


Fig. 3.

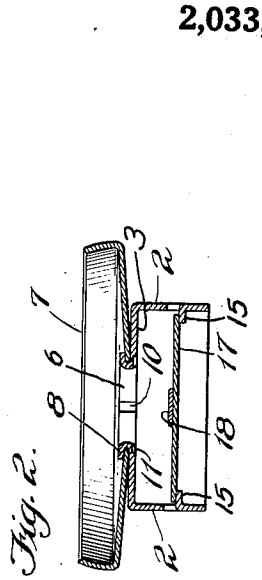


Fig. 2.

Fig. 4.

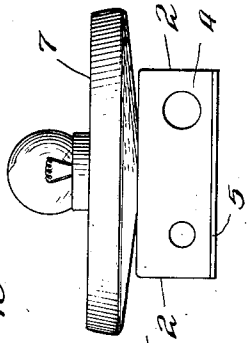


Fig. 5.

INVENTOR.

Samuel M. Dover

BY

Morris Spector,

ATTORNEY.

Patented Mar. 10, 1936

2,033,692

UNITED STATES PATENT OFFICE

2,033,692

SIGNAL LAMP UNIT

Samuel M. Dover, Chicago, Ill.

Application February 4, 1935, Serial No. 4,809

12 Claims. (Cl. 177—329)

This invention relates to signal lights, and more particularly such lights as are mounted on the outside of automobile trucks or the like, and is especially concerned with a multiple light unit which shall be simple and economical of construction and possess other advantages hereafter set forth.

Automobile trucks are generally provided with a rear signal light unit comprising a channel-shaped frame having a plurality of spaced lights thereon, generally three, for purposes well known in the art. Such light units project outwardly from the truck and are relatively unprotected against injury by ropes or the like that may be used for securing the load. The greater the thickness of the unit the further it projects outwardly of the truck and the greater is the probability of injury to the unit.

In the prior constructions of signal light units of the type here concerned, a plurality of electric bulbs with their individually associated reflector and/or cover glass holding means are located entirely on the outer side of the web of a channel-shaped strip, the electric conductor for the lamps being located on the other side of the web, that is, in the trough of the channel. The circuit to the contact in the base of each bulb is made by a terminal that is spring-pressed against the contact of the bulb. In those prior constructions, the terminal and the spring means for maintaining the pressure of the terminal against the bulb contact are located entirely on the outer side of the web of the channel, that is, on the same side that the entire lamp is located. As a result, the total height or thickness of the unit is considerable. It is an object of the present invention to provide a lighting unit of the above general class which shall be of a minimum thickness, thus reducing, as far as possible, the probability of injury to the unit in normal use. I have found that by changing the construction of the terminal which engages the contact in the base of the electric bulb there is ample available space in the trough of the channel-shaped frame to allow for the mounting of that terminal on the inner side of the web of the channel frame. My construction also permits the electric bulb to be so mounted that a portion of the base thereof extends through the web of the channel, so that only a portion of the entire bulb extends in front of the web, and none of the terminal structure is in front of the web of the channel. By this construction the overall thickness of the unit is considerably reduced.

It is a further object of the present invention to simplify the spring-pressed terminal structure use on lighting units of the above general class. The terminal of my unit comprises a narrow strip of conducting metal lying on top of a wider strip of stiff but flexible insulation. The terminal strip extends the full length of the strip of insulation, centrally thereof, and is riveted thereto at its opposite ends. At each point where the terminal strip is engaged by a bulb contact it has a shallow cupped depression formed therein. The strip of insulation is of a width sufficient to fit snugly between the flanges of the channel frame, and it is located between those flanges, with the terminal strip side thereof facing the web of the channel. Each flange of the channel has a plurality of projections punched therein for holding the strip of insulation in place. The holding or supporting projections are spaced apart sufficiently to permit an appreciable flexing or outward bowing of the strip between adjacent supporting projections upon the application of proper force to accomplish that result. The supporting projections are so spaced that no projection is located immediately opposite a lamp-receiving opening or socket in the web of the channel. When the base of an electric light bulb is inserted into a socket, the contact of the bulb engages the terminal strip and bows it outwardly, the bowing occurring between adjacent supporting projections. The natural resiliency of the insulation strip causes it to exert a firm pressure against the bulb, thus maintaining a firm contact between the terminal and the bulb contact. This provides a simple terminal construction wherein a firm spring pressure is maintained between the terminal and the bulb contact, without the usual springs that are generally used. By this arrangement not only is the size of the unit reduced, but also the cost, for I have eliminated the terminal assemblies heretofore used, as well as the springs for pressing the respective terminals against the contacts of the light bulbs. The cost of the structure added is approximately equal to, or even less than, the cost of the labor previously required for wiring the unit, which wiring work has been eliminated in the present unit.

It is a still further object of the present invention to simplify the holding means for the light bulbs by eliminating the usual tubular sockets heretofore provided for that purpose. The sockets in the present invention comprise merely openings in the web of the channel frame,

each opening having two short diametrically opposed slots for receiving the pins that project from the stem of the light bulb. After the end of a bulb has been inserted into the opening, and turned 90 degrees, it is held against upward movement, and the spring pressure of the terminal strip and its backing holds the bulb firmly in position.

The attainment of the above and further objects of the present invention will be apparent from the following specification, taken in conjunction with the accompanying drawing forming a part thereof. In the drawing:

Figure 1 is a side view of a lighting unit constructed in accordance with the present invention, certain of the parts being broken away to illustrate the construction;

Figure 2 is a sectional view taken along the line 2—2 of Figure 1;

Figure 3 is a perspective view of the terminal unit;

Figure 4 is a fragmentary view of the under side of the web of the channel at one of the light bulb sockets; and

Figure 5 is an end view of the unit.

Referring now more particularly to the drawing, in Figure 1, I have shown a multiple light unit having three lights thereon. The unit comprises a sheet metal channel-shaped support 1 on which the various parts are assembled. The channel includes flanges 2—2 and a web portion 3, the ends of which are bent over, as indicated at 4, to form extensions 5 for mounting the unit, as is usual in the art. Instead of the extensions 5, the flanges 2—2 may be provided with short laterally-projecting mounting flanges at their lower end, since the frame 1 may be mounted in place in any desired manner. Three holes, forming light bulb sockets, are formed in the web of the channel, one of the holes being indicated at 6. At each of the sockets is secured a disc-like shallow saucer-shaped lamp housing and cover lens holder 7, which is adapted to hold any preferred type of lens 7' in the usual manner. The members 7 are secured to the web of the channel 1 in any preferred manner, in this instance by forming a very slight tubular projection around the hole 6, which projection fits into a hole in the member 7 and is then beaded over, as indicated at 8 in Figure 2. It is, however, to be understood that any other method of securing the two may be used insofar as concerns the broad aspects of the present invention.

The holes 6 are of a diameter just sufficient to permit the stem of a proper electric light bulb to be inserted therethrough. The base of such bulbs has two diametrically opposite pins projecting therefrom, for holding the bulb in a bayonet type socket. To permit the bulb base, with its projecting pins, to pass through the hole 6, there are formed, in the metal at the edge of the hole 6, two short pin-receiving slots 10—10. After the base of a bulb is inserted into the socket the bulb is turned 90 degrees, whereupon the pins in the bulb base come opposite a pair of diametrically spaced short indentations 11—11 on the under side of the web 3 at the edge of the opening 6, for holding the bulb against turning.

Each of the flanges 2—2 has a number of very short inwardly punched indentations 15 formed thereon. These indentations serve as a support for a terminal unit to be presently described. It is sufficient here to state that none of the indentations is located directly opposite a light bulb socket, for reasons which will be apparent as this description proceeds.

The terminal unit of the present invention is illustrated in Figure 3. It comprises a strip 17 of stiff but flexible and resilient insulating material, to which is secured a narrow contact strip of metal 18 of good electric conductivity, by rivets 19 and 20. One suitable material is the substance known as "Formica", which comprises thin sheets of paper impregnated with the substance known as "bakelite" and treated by heat and pressure to form one piece of material. The rivet 19 serves also to secure an insulated conductor 21 in firm electric engagement with the contact strip. The contact strip 18 has a number of terminals 22 formed thereon and suitably spaced so that a terminal is opposite each socket 6 when the terminal unit is asembled in the channel frame. Each terminal 22 is formed by merely stamping the contact strip with a suitable die to produce a projection, the upper surface of which forms a bulb contact receiving cavity. The strip 17 is of a length only slightly less than the distance between the ends 4—4 of the channel-shaped support 1, and of a width slightly less than the inside width of the channel of the frame.

When the terminal unit is inserted in place it lies flat in the channel of the frame 1, resting upon the indentations 15. When a bulb is inserted into its socket, the tip contact in the base of the bulb engages the corresponding terminal 22 and forces it downwardly, thus flexing the strip 17 as illustrated in Figure 1. The strip 17, being rather stiff, exerts a considerable spring pressure against the contact at the lower end of the bulb base, thus maintaining a firm electric engagement between the bulb contact and the terminal 22. Also, the spring pressure between the contact and the terminal 22 prevents any rattling or shifting of the strip 17 in the channel of the frame due to vibration or sudden movements of the vehicle on which the unit is mounted, and, by maintaining an upward force on the bulb, the pins of the bulb are held in the indentations 11—11, thus holding the bulb against turning.

It is to be noted that the members 7 are exceedingly shallow and lie quite close to the web of the channel. This reduces, quite appreciably, the possibility of loose ropes, or the like, being caught under one of said members and then pulling the member off as the ropes are drawn taut. Also, it is to be noted that the bulb extends outwardly of the web of the channel by an amount appreciably less than the full length of the bulb including its base, since an appreciable portion of the base of the bulb is below the web of the channel-shaped support 1. Thus the entire overall thickness of the unit is very much less than that of corresponding units heretofore available. Also, it is to be noted that I have omitted the usual pressure contact maintaining springs that maintain a pressure engagement with the contact in the base of the bulb, and I have also eliminated the usual cylindrical socket-forming member heretofore provided for receiving the bulb base. All this has tended towards simplification of the unit from the point of view of cost, as well as reduced the overall thickness of the same.

The indentations, or projections, 15 are spaced from the sockets so as to permit flexing of the strip 17. At the ends of the unit one of the in-

dentations 15 must necessarily be quite close to the bulb socket. Therefore the indentation on the other side of the end socket is spaced somewhat further from the bulb socket, thus again permitting appreciable flexing of the strip 17.

The circuit through each bulb is by way of conductor 21, strip 18 and a terminal 22, to the contact on the base of the light bulb, thence through the bulb filament to the base of the light bulb which is grounded through the grounded frame 1.

In compliance with the requirements of the patent statues, I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention.

What I consider new and desire to secure by Letters Patent is:

1. A multiple light unit comprising a channel-shaped frame having a plurality of electric bulb sockets formed in the web thereof, and within the trough of the channel a terminal assembly comprising a comparatively long and narrow strip of flexible insulation, means for supporting the strip of insulation in the channel, a contact strip extending longitudinally of the insulating strip along the center of one surface of the insulating strip, said contact strip having a plurality of dished contacting terminals formed as an integral part of the contact strip and spaced from one another lengthwise of the contact strip, said terminals being opposite the respective bulb sockets.

2. A multiple light unit comprising a channel-shaped frame having a plurality of electric bulb sockets formed in the web thereof, and within the trough of the channel a terminal assembly comprising a comparatively long and narrow strip of flexible insulation, a contact strip extending longitudinally of the insulating strip along one surface of the insulating strip, said contact strip being opposite the respective lamp sockets, and means for supporting the terminal assembly in the trough of the channel comprising a plurality of spaced indentations formed in the flanges of the channel and upon which the insulating strip rests.

3. A multiple signal light unit adapted to be mounted on the outside of a vehicle, said unit comprising a channel-shaped frame having means for mounting the same, said frame having spaced holes formed in the web thereof and constituting bulb sockets, electric bulbs in the respective sockets with the bases of the bulbs extending into the trough of the channel, and means entirely within the trough of the channel for holding the bulbs in place and for establishing circuit connections thereto, said means including a strip of flexible insulating material extending longitudinally within the trough of the channel and having contact-making means engaging the contacts on the base of the bulbs, said strip being resilient and being flexed out of its normal position by the tips of the lamps, whereby said strip exerts a spring pressure on said lamps.

4. A multiple light unit comprising a channel-shaped frame having holes formed in the web thereof comprising electric bulb sockets, a terminal assembly within the trough of the channel, said assembly comprising a strip of insulation of stiff flexible material with a conductor strip along the center thereof, said strip of insulation lying substantially parallel to the plane of the web of the channel and spaced therefrom, means for supporting said insulating strip comprising indentations formed in the flanges of the channel and on which the insulating strip rests, the insulating strip being free of fixed support at the respective bulb sockets, thereby permitting flexing of the insulating strip at the lamp sockets, said conductor strip being engaged by the contact on the base of a bulb when a bulb is inserted into a socket, and exerting a pressure on the bulb contact.

5. A multiple light unit comprising a channel-shaped frame having holes formed in the web thereof comprising electric bulb receiving sockets, a terminal assembly within the trough of the channel, said assembly comprising a strip of insulation of stiff flexible material with a conductor strip along one face thereof, said strip of insulation lying substantially parallel to the plane of the web of the channel and spaced therefrom, and means for supporting said insulating strip.

6. A multiple light unit comprising a channel-shaped frame having holes formed in the web thereof comprising electric bulb receiving sockets, the material at the edge of each hole having pin-receiving slots formed therein, a terminal assembly within the trough of the channel, said assembly comprising a strip of insulation of stiff flexible material with a conductor strip along the center thereof, said conductor strip having bulb contact receiving terminals at points opposite the bulb sockets, said strip of insulation lying substantially parallel to the plane of the web of the channel and spaced therefrom, means for supporting said insulating strip comprising indentations formed in the flanges of the channel and on which the insulating strip rests, the insulating strip being free of fixed support at the respective sockets, thereby permitting flexing of the insulating strip at the sockets, said insulating strip being spaced from the web of the channel by an amount less than the normal projection of a bulb base through the web when a bulb is inserted into a socket, whereby the strip of insulation is flexed away from the web by a bulb inserted into the socket and thus exerts a spring pressure on the bulb to maintain the terminal in pressure engagement with the contact at the base of the bulb.

7. A multiple light unit comprising a channel-shaped frame having holes formed in the web thereof for receiving electric light bulbs, a unitary flexible terminal assembly on the inner side of the web of the channel comprising a contract strip and a supporting strip of insulation both extending lengthwise of the channel, in alignment with the holes and spaced from the web of the channel to permit engagement of the contact strip by a bulb inserted in any of the holes, and means for supporting the terminal assembly adjacent each hole thereby preventing recession of the contact strip out of engagement with a bulb in one hole when the contact strip is flexed away from the web of the channel by a bulb in an adjacent hole.

8. A light unit comprising a channel-shaped frame having a plurality of holes formed in the web thereof, means at each hole forming a bayonet type electric bulb socket, and within the trough of the channel a terminal assembly including a flexible contact strip extending lengthwise of the channel opposite the holes and spaced from the web of the channel an amount less

than the amount that a bulb projects through the holes, whereby a bulb deflects the strip from its normal position, and means supporting the terminal assembly in the trough of the channel and permitting flexing of the terminal assembly away from the web of the channel by the pressure of a lamp bulb inserted into a hole, said supporting means being spaced along the length of the channel so that the pressure of the contact against any bulb is substantially independent of the amount of deflection of the strip produced by any other bulb.

9. A multiple signal light unit adapted to be mounted on the outside of a vehicle, said unit comprising a channel-shaped frame having spaced holes formed in the web thereof and constituting electric bulb sockets, electric bulbs in the respective sockets with the bases of the bulbs extending into the trough of the channel, and means extending within the trough of the channel from socket to socket for holding the bulbs in place and for establishing circuit connections thereto, said means comprising a flexible supporting strip extending lengthwise within the channel, said strip being flexed away from the web by the bases of the electric bulbs, and means for supporting the strip adjacent each socket to permit flexing of the strip away from the web of the channel independently at each of the respective sockets.

10. A signal lamp unit comprising a comparatively long and narrow flat plate structure having holes therein constituting bulb sockets, a contact strip extending longitudinally of the plate structure in alignment with the sockets and spaced from the plate structure and insulated therefrom, bulbs in the sockets and engaging the contact strip, and means supporting the contact strip and maintaining a spring pressure engagement between the contact strip and the bulb, said means including a flexible strip of insulation extending lengthwise of the structure and supporting the contact strip and including also means at each socket for supporting the flexible strip while permitting flexing of the same away from the plate structure at the respective sockets.

11. A multiple light unit comprising a channel-shaped frame having holes formed in the web thereof for receiving electric bulbs, electric bulbs in the respective holes with the bases of the bulbs extending through the web of the channel into the trough thereof, a contact strip within the trough of the channel and extending lengthwise thereof and engaging the tips of the bulbs, and resilient insulating means also extending the length of the channel and pressing the contact strip against the bulbs, said resilient insulating means being supported at a plurality of places along the length of the channel, whereby it may be flexed away from any hole by a bulb therein while maintaining a substantially constant pressure against the other bulbs.

12. A terminal assembly comprising a comparatively long and narrow strip of flexible insulation, a contact strip extending longitudinally of the insulating strip along the center of one surface of the insulating strip, said contact strip having a plurality of dished contacting terminals formed as an integral part of the contact strip and spaced from one another lengthwise of the contact strip.

SAMUEL M. DOVER.