Oct. 29, 1940. H. J. DILLON 2,219,383

ILLUMINATING APPARATUS

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Fig. 1.

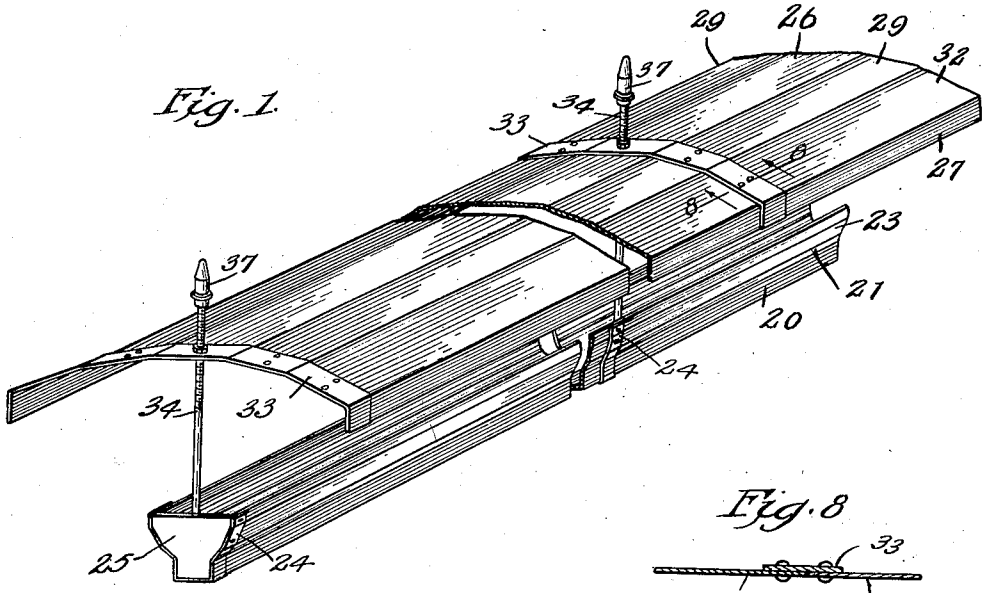
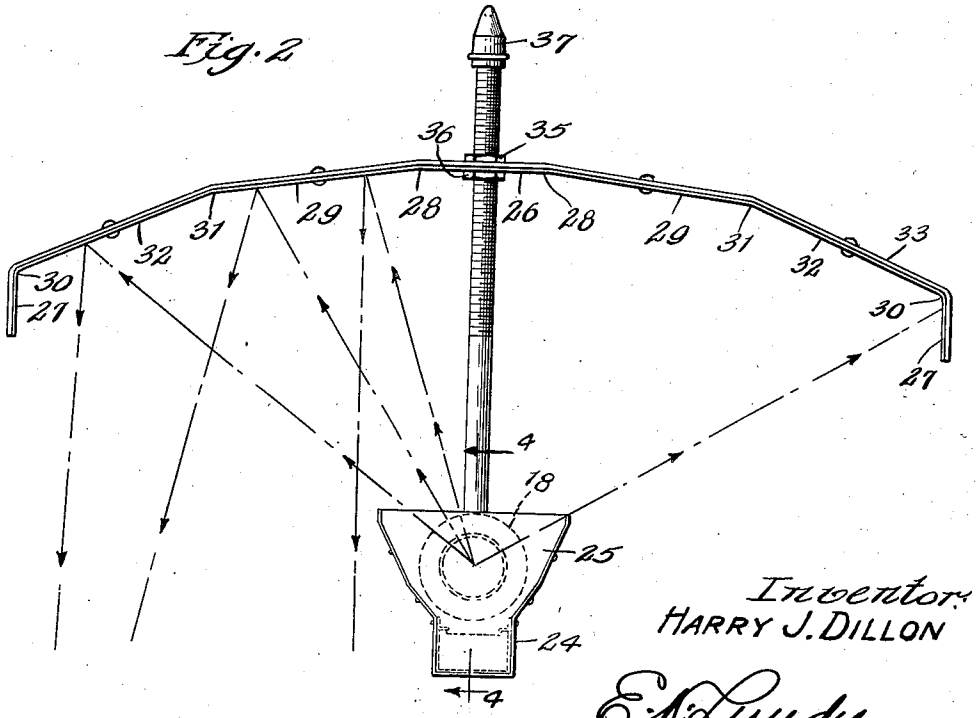


Fig. 8

Fig. 2



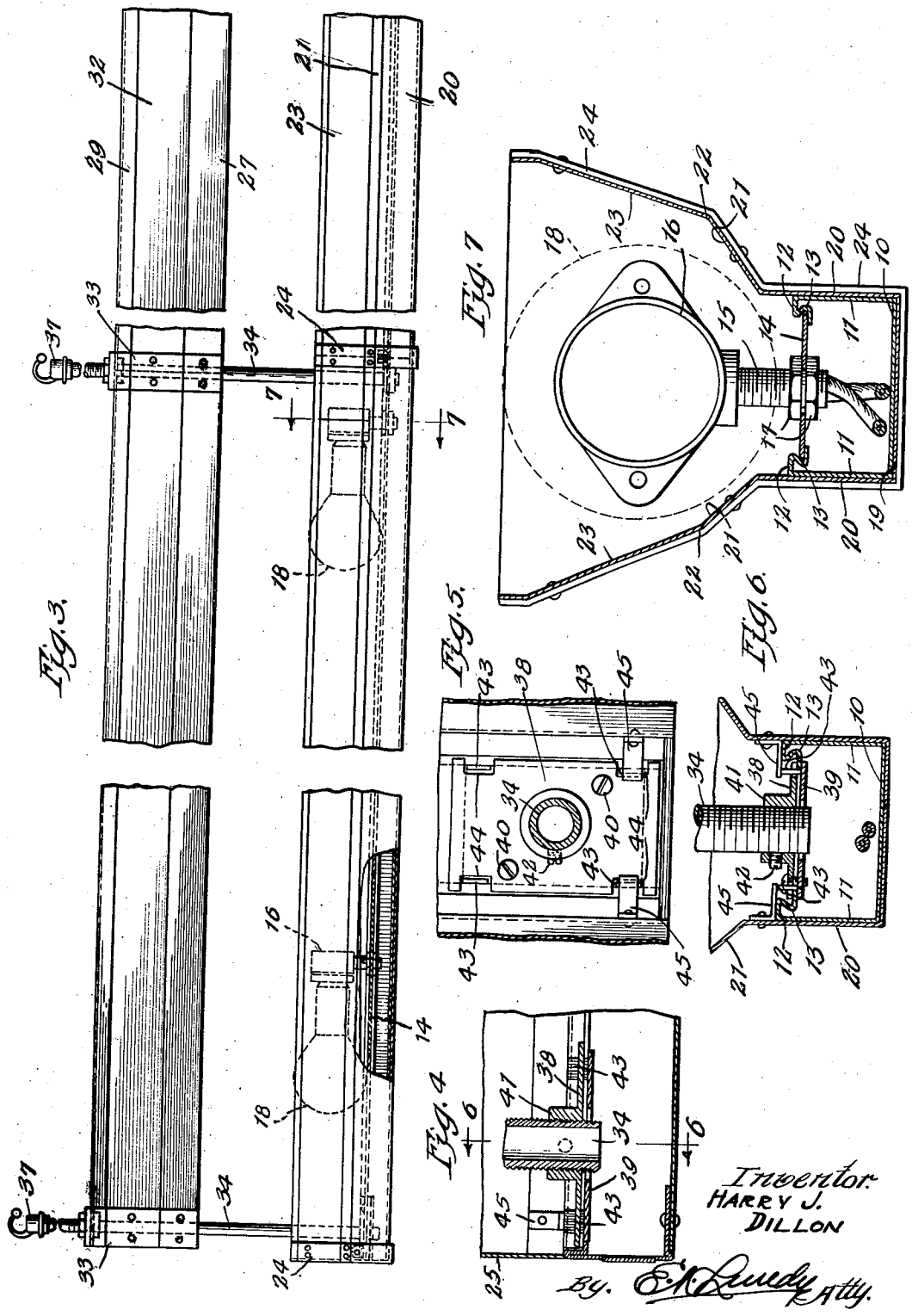
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2,219,383

UNITED STATES PATENT OFFICE

2,219,383

ILLUMINATING APPARATUS

Harry J. Dillon, Wilmette, Ill.

Application February 13, 1937, Serial No. 125,586

12 Claims. (Cl. 240—9)

My invention relates generally to illuminating apparatus, and it has more specific reference to means for illuminating what is known as an "assembly line" such as now quite generally used in large factories, and the like. It will be understood, however, that the herein-disclosed structure is well-adapted for many other purposes than the one just previously referred to. The structure is made in a manner that permits the securing together of the desired number of units or sections that are disposed end to end for the purpose of providing a continuous illuminating apparatus of any length required. In this connection I have made use of the principles of indirect lighting in order that glare is avoided and there is an absence of darkened or shaded areas below the fixture. Also I have provided means whereby proper and desired adjustment of the related parts may be made to the end that the greatest efficiency of the bulbs is obtained and the light-rays therefrom are nicely controlled and directed upon the areas where they are of most advantage to the person working below the apparatus.

It is the purpose of my invention to provide an illuminating apparatus having numerous objects in view, among which are compactness in the arrangement and disposition of the parts; dependability of operation; efficiency in performing its required functions; novelty in construction; and economy in manufacture, installation and use. I prefer to carry out my invention in substantially the manner hereinafter described and as more particularly pointed out in the claims, reference being made to the accompanying drawings which form a part of this specification.

In the drawings:

Figure 1 is a graphic view, drawn in perspective, showing two sections of my lighting apparatus assembled for use.

Figure 2 is an end elevation of the structure shown in Figure 1, drawn to a larger scale.

Figure 3 is a longitudinal side elevation of the structure shown in Figure 1 with a portion broken away.

Figure 4 is a vertical longitudinal section on line 4—4 of Figure 2 drawn to a larger scale.

Figure 5 is a top plan of the structure shown in Figure 4.

Figure 6 is a vertical transverse section on line 6—6 of Figure 4.

Figure 7 is a vertical transverse section on line 7—7 of Figure 3 drawn to an enlarged scale.

Figure 8 is a section of a fragmentary portion of the upper reflecting hood, taken on line 8—8 of Figure 1.

It is to be understood that the drawings are, in a sense, merely schematic for the purpose of disclosing a typical or preferred embodiment of my invention; and in the said drawings the same reference characters are employed to identify like parts wherever such parts are shown in the different views.

In carrying out my invention I employ an elongated conductor housing that has a plurality of differently constructed closure elements which latter afford the respective facilities for mounting electric sockets and bulbs, the spacing hangers, the inverted reflector or trough, etc., and above the conductor housing and trough there is an especially shaped elongated hood of the same length as the housing that acts as a reflector to direct the rays in a downward direction. The assembled structure, briefly described above, comprises a unit several feet in length and any number of these units may be secured together in a sectional formation to provide an illuminating apparatus several hundred feet in length.

The housing consists preferably of an elongated strip of sheet metal bent into a substantially rectangular U-shape and having a longitudinal opening in its top that is closed by certain instrumentalities to provide an enclosure for conductor wires. In cross-section, the housing embodies a horizontal bottom 10, and vertical parallel side-walls 11 that have inturned flanges 12 along their upper edges which terminate in downwardly disposed Z-shape or S-shape guides 13 that face each other to receive the longitudinal edges of the closure plates 14 that are removably and adjustably mounted therein. These closure plates 14 are preferably elongated metal strips that are apertured to permit insertion therein of the tubular mount or supporting element 15 extending laterally down from a standard-type electric lamp socket 16 that has its opening disposed with its axis in a horizontal plane. The tubular mount 15 is securely anchored in place by nuts 17 turned on its threaded portion above and below the plate 14. As shown, a plurality of these sockets may be arranged in spaced relation to each other with their lamps or bulbs 18 disposed horizontally throughout the length of a single unit or section of my illuminating apparatus.

Means are preferably carried by the housing for controlling certain of the light rays from the bulbs 18 and directing such rays in a generally

upward direction, such control means being in the form of an elongated trough-like reflector that partly surrounds and extends above the housing to a horizontal plane above the light center of the bulbs. This reflector is an elongated metal sheet that is bent substantially U-shape intermediate its longitudinal edges to provide a bottom **19** and horizontally spaced upright parallel sides that are placed flat against the corresponding portions of the housing. These sides **20**, however, may extend above the top of the housing as shown in Figure 7 and they are bent or flared outward and upward to provide the lower reflector walls **21** on opposite sides of the lower portions of the bulbs. Another longitudinal bend is made in each side of the reflector member as at **22** to provide the upper reflecting walls **23** of said member that extend upward and outward but are more nearly vertical than the walls **21**. Suitable reinforcing metal straps **24** are riveted or otherwise secured to the end edges of the reflector trough and are shaped or bent to fit the outside configuration of said trough. These straps **24** are arranged to extend beyond the end edges of the reflector trough of one illuminating unit or section in order that such extended portion of a strap may be secured to the end marginal portion of the adjacent or next succeeding unit or section, and so on throughout the entire length of a particular installation. Thus, an "assembly line" several hundred feet in length may be provided with an illuminating apparatus that is continuous and unbroken from end to end. Vertically disposed end walls **25** are secured in any suitable manner to the ends of the trough for the purpose of closing the latter as well as the ends of the housing. In outline these end walls correspond to the cross-sectional shape of the trough-like reflector and its U-shaped lower portion that embraces the sides and bottom of the housing.

The direct light rays emanating from the bulbs and the light rays that are projected upward and outward from the reflecting faces or walls **21** and **23** of the reflector trough do not reach the ceiling but are interrupted by the underneath reflecting surface of an elongated hood or canopy disposed in spaced relation above the reflector trough and housing. The purpose of this hood or canopy is to change the direction of the light rays by projecting them, in a controlled manner, downward to the level of the work-plane below the housing. By reference to the dot-dash lines in Figure 2 it may be seen that all of the light rays leaving the interior of the trough, both those direct from the bulbs and those reflected from the surfaces of the walls **21** and **23**, are projected downward by the hood or canopy and do not escape past the sides of the latter. This hood or canopy embodies a strip of sheet metal substantially the length of the strip forming the reflector trough but of considerably greater width as will be apparent by reference to Figure 2. The central longitudinal portion **26** of the hood is preferably horizontal and the outer marginal portions **27** depend vertically to provide pendent longitudinal skirts that extend the entire length of each unit or section of the apparatus. At the side edges of the mid-portion the metal sheet is given bends or breaks to provide slightly oblique surfaces forming longitudinal parallel zones **29** that incline downward away from the horizontal central zone **26**. About half-way between the bends **28** and the acute bends **30** at the tops of the pendent skirts **27**, the metal sheet is given bends or breaks **31** which provide other downwardly inclined oblique surfaces forming parallel longitudinal zones **32**.

The disposition or planes of the several zones **26**, **29** and **32** are such that practically all the direct light rays from the bulbs **18** as well as the reflected light rays from the interior surfaces of the trough reach these zones and are reflected in a downward direction to the working plane. The skirts **27** are arranged so that none of the light rays passing above the upper edges of the reflector trough can escape beyond or past the hood or canopy as shown by the dot-dash line at the right in Figure 2. Suitably shaped straps **33** reinforce the end edges of the metal sheet forming the hood or canopy and are riveted or otherwise secured to the metal sheet so as to extend beyond the end edge thereof in order to overlap and be secured to the abutting marginal end portion of the next succeeding unit or section, substantially in the same manner that the straps **24** secure the abutting edges of the trough units together.

The hood or canopy is maintained in proper spaced relation to the lower members of the apparatus by means of hangers **34** which are preferably metal rods or pipes that have elongated threaded portions that pass through suitable apertures in the straps **33** and the hood and are secured in adjusted positions by nuts **35** and **36** that engage respectively the upper and lower faces of the hood. Suitable suspension hooks or rings **37** at the upper ends of the hangers **34** provide means for receiving pendent cables, chains, or other devices by which the fixture may be suspended from the ceiling or other overhead structure. By this arrangement the entire fixture may be bodily raised or lowered to the proper position relative to the working plane being illuminated, and the hood and trough may be adjusted relative to each other in order to secure the greatest efficiency from the lamps or bulbs mounted in the trough. This latter adjustment is especially desirable to take care of different sizes or types of lamps or bulbs that may be used in the trough.

Threads are provided on the lower end portions of the hangers **34** that extend into the conductor housing and means are provided in the upper opening of said housing to anchor the hangers in place. The means which have just been mentioned embody a pair of rectangular plates **38** and **39** that are of proper width to enter the opening in the top of the housing and have their longitudinal edges engage with the lower horizontally disposed lips or shelves of the Z-shaped guides **13**. Plate **38** rests upon the shelves of the guides, while plate **39** engages the under-surfaces of these shelves, and the two plates are drawn towards each other in clamping relation against said shelves by screws **40**. These plates have central apertures for passage of the adjacent portion of the hangers and threaded hollow stubs **41** surround the openings in the upper plates **38** into which the hangers are screwed and secured against rotation by a transverse lock element **42**. Upstanding lugs **43** at the corners of the lower plates **39** fit into edge recesses **44** in the top plates and assist in preventing relative movements of the plates, and in order to avoid accidental dislodgement of these plates suitable L-shaped metal clips **45** are anchored to the trough at the locations of the straps **24** so that the lateral arms of said clips will rest upon the upper ends of at least two of the lugs **43** of

each set of plates. Thus, should the clamp screws **40** become loosened the plates are prevented from leaving their proper positions on the guides by said clips.

When the plates **38** and **39** and the closure plates **14** are disposed in abutting relation to each other, thus providing a complete cover for the opening in the top of the housing. It will be noted that the various parts of the apparatus are what may be called "standardized," and the units or sections may be fabricated in several stock lengths. Also the spacing of the sockets may be any distances that are desirable merely by selecting the proper length of cover plates **14**.

In some instances it may be found that the overhead space above the work plane may not be such as to dictate the use of the hood. That may be readily taken care of by installing the housing and trough at proper distance from the ceiling so that the upwardly directed light rays from within the trough will be reflected in a downward direction to the work plane. While desirable, it is not necessarily essential, that the ceiling for such an installation should be a horizontal surface which is preferably painted or treated with some sort of light reflecting material.

What I claim is:

1. Illuminating apparatus comprising a plurality of elongated units arranged in end to end alinement, each said unit embodying a reflector trough, electric sockets and lamps within said trough, a relatively wide reflector hood above and overhanging said trough, said hood having a continuous uninterrupted concave reflecting surface above said trough, hangers connecting said trough and hood for adjustably maintaining them in spaced relation to each other, and reinforcing elements at the ends of said trough and hood and adapted for connection to the respective trough and hood of the next succeeding unit of the apparatus.

2. Illuminating apparatus comprising a plurality of elongated sectional units arranged in end to end alinement, each said unit embodying a reflector trough having upwardly flared sides, an electric conduit housing in the bottom thereof, electric sockets and lamps within said trough, an elongated hood spaced above said trough and overhanging the edges thereof a substantial distance on each side, said hood having a continuous uninterrupted concave reflecting surface above said trough, hangers secured at their lower ends to said housing and having intermediate portions passed through said hood, means on said hangers and engaged with said hood for maintaining the latter in adjusted spaced relation to said trough, and means for securing adjacent ends of said units together and providing a continuous structure having substantial length.

3. Illuminating apparatus comprising a plurality of elongated units arranged in end to end alinement, each said unit embodying a reflector trough, an electric conduit housing in said trough and having an open top, removable closure plates extending across the housing opening, electric sockets and lamps mounted on said plates, an elongated hood above said trough and overhanging the edges thereof a substantial distance on each side, hangers extending through said hood and having their lower ends secured to said closure plates, and means on intermediate portions of said hangers and engaged with said hood for maintaining the latter in adjusted spaced relation to said trough.

4. Illuminating apparatus comprising a plurality of elongated units arranged in end to end alinement, each said unit embodying a reflector trough, an electric conduit housing in said trough and having an open top, removable closure plates extending across the housing opening, electric sockets and lamps mounted on said plates, an elongated hood above said trough and overhanging the edges thereof a substantial distance on each side, hangers extending through said hood and having their lower ends secured to said closure plates, means on intermediate portions of said hangers and engaged with said hood for maintaining the latter in adjusted spaced relation to said trough, and reinforcing straps at the ends of said trough and hood and adapted for connection to the respective trough and hood of the next succeeding unit of the apparatus.

5. Illuminating apparatus comprising an elongated reflector trough, a housing in the bottom of said trough for the reception of electric conductors, a plurality of electric sockets on said housing, lamps in said sockets, said trough adapted to reflect light rays from said lamps in an upward direction out of said trough, an elongated relatively wide reflector hood above said trough, whereby light rays from said lamps and said trough are reflected downward to a work-plane below said trough, and means for supporting said hood in spaced relation to said trough, said means embodying devices for adjusting said trough and said hood relative to each other.

6. Illuminating apparatus comprising an elongated reflector trough, a housing in the bottom of said trough for the reception of electric conductors, said housing having an open top, removable closure plates extending across said housing opening, a plurality of electric sockets on said closure plates, lamps in said sockets, said trough adapted to reflect light rays from said lamps in an upward direction out of said trough, an elongated relatively wide reflector hood above said trough, whereby light rays from said lamps and said trough are reflected downward to a work-plane below said trough, and means for supporting said hood in spaced relation to said trough, said means embodying devices for adjusting said trough and said hood relative to each other.

7. Illuminating apparatus comprising an elongated reflector trough, a housing in the bottom of said trough for the reception of electric conductors, a plurality of electric sockets on said housing, lamps in said sockets, said trough adapted to reflect light rays from said lamps in an upward direction out of said trough, an elongated relatively wide reflector hood above said trough, whereby light rays from said lamps and said trough are reflected downward to a work-plane below said trough, and hangers secured at their lower ends to said closure plates and having intermediate portions passed through said hood, and means on said hangers and engaged with said hood for maintaining the latter in adjusted spaced relation to said trough.

8. Illuminating apparatus embodying an elongated electric conductor housing of substantially rectangular cross-section and having a longitudinal opening in its top, removable closure members extending across said opening, an elongated trough having a U-shaped channel in its lower portion that embraces the sides and bottom of said housing, each sidewall of said trough being extended above said housing and having a plurality of parallel longitudinal reflecting bands,

and electric sockets and lamps mounted on certain of said closure members with said lamps positioned between oppositely disposed reflecting bands of said trough; and an elongated relatively wide hood above said trough, said hood having a continuous uninterrupted concave reflecting surface receiving light rays from said lamps and trough.

9. A sectional illuminating apparatus comprising a plurality of elongated units arranged in end to end alinement, each of said units embodying an elongated conductor housing having a longitudinal opening in its top, removable closure members extending across said opening, an elongated trough having its lower portion embracing said housing, each side-wall of said trough being extended above said housing and having a plurality of parallel longitudinal reflecting bands, electric sockets and lamps mounted on certain of said closure members with said lamps positioned between oppositely disposed reflecting bands, an elongated relatively wide hood above said trough, said hood having a continuous uninterrupted concave reflecting surface receiving light rays from said lamps and trough, means for supporting said unit, and devices for securing the ends of a unit to the ends of adjacent units whereby to provide an illuminating apparatus of desired and substantial length.

10. An illuminating device comprising a plurality of end to end units, each said unit embodying a relatively wide elongate hood having a continuous uninterrupted concave reflector surface on its lower face; electric sockets and lamps below said hood and spaced therefrom; means for supporting said sockets on said hood, said means adapted for adjustment whereby to selectively position said lamps with respect to said hood; reflecting means disposed lateral to said lamps and below said hood, said reflecting means adapted to emit light rays outwardly, said reflecting means also adapted to shield the eyes of persons adjacent the device from the direct rays of light from said lamps; and devices at the ends of said hood and said reflecting means adapted for connection to the respective hood and reflecting means of the next succeeding unit of the apparatus.

11. An illuminating device comprising a plurality of end to end units, each said unit embodying a relatively wide elongate hood having a continuous uninterrupted concave reflector surface on its lower face; electric sockets and lamps below said hood and spaced therefrom; means for supporting said sockets on said hood, said means adapted for adjustment whereby to selectively position said lamps with respect to said hood; reflecting means disposed lateral to said lamps and adapted to emit light rays upwardly, the upper margins of said reflecting means terminating in a horizontal plane a substantial distance below the horizontal plane of the lowermost portions of said hood, said reflecting means adapted to prevent escape of upward light flux below said hood, said reflecting means also adapted to shield the eyes from the direct rays of light from said lamps; and devices at the ends of said hood and said reflecting means adapted for connection to the respective hood and reflecting means of the next succeeding unit of the apparatus.

12. An illuminating device comprising a plurality of end to end units, each said unit embodying a relatively wide elongate hood having a continuous uninterrupted concave reflector surface on its lower face; a light source below said hood and spaced therefrom; means for supporting said light source on said hood, said means adapted for adjustment whereby to selectively position said light source with respect to said hood; reflecting means disposed lateral to said light source and below said hood, said reflecting means adapted to emit light rays upwardly to said hood, said reflecting means also adapted to shield the eyes of persons adjacent the device from direct rays from said light source; and devices at the ends of said hood and said reflecting means adapted for connection to the respective hood and reflecting means of the next succeeding unit of the apparatus.

HARRY J. DILLON.