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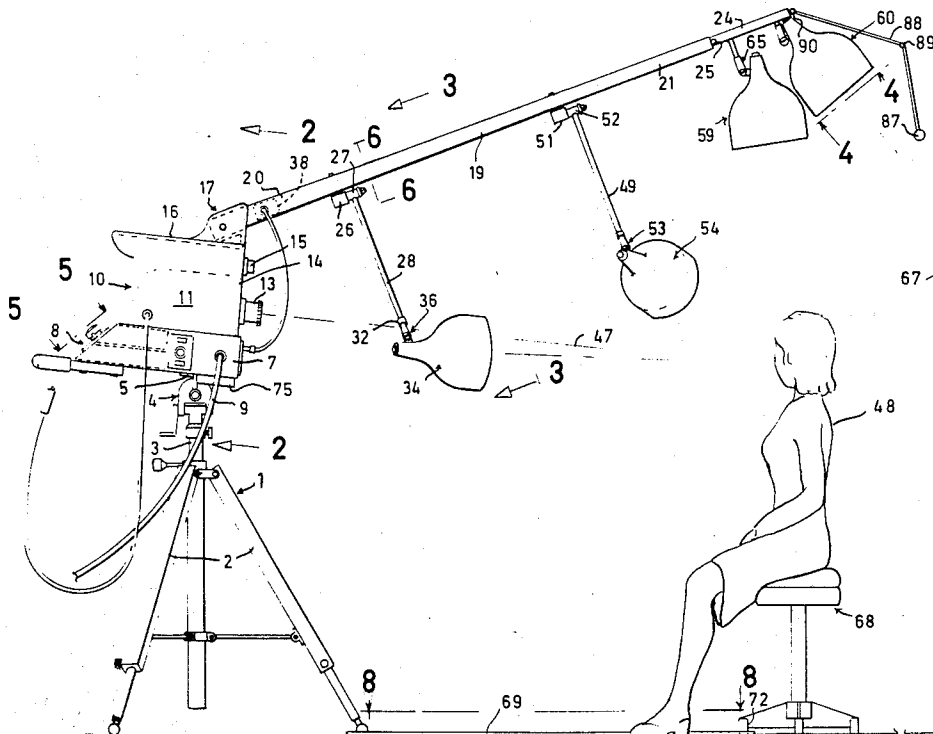
[54] **PHOTOGRAPHIC LIGHTING ASSEMBLY**  
 5 Claims, 16 Drawing Figs.

[52] U.S. Cl. .... 240/1.3,  
 240/2 C, 95/86  
 [51] Int. Cl. .... G03b 15/035  
 [50] Field of Search ..... 240/1.3, 2  
 C, 95/82, 86; 355/70

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**ABSTRACT:** A compact, portable photographic assembly that includes a camera support for supporting a camera in a position with the optical axis of its lens directed generally horizontally to one side of said camera, said support being rotatable about a vertical axis, and supporting the inner end of a relatively long boom in a position projecting laterally outwardly and upwardly from said support with said inner end positioned above said camera, and its outer end spaced above the head of a person to be photographed when such person is on said optical axis. Arms spaced between the inner and outer ends of said boom project laterally oppositely outwardly of said boom, each being swingably connected with said boom at one of their ends and each having a lamp and reflector on its opposite end movably supported thereon for varying the position of the lamp and reflector to provide diffused reflected rays of light or direct rays according to the effect desired. The arms carrying said lamps and reflectors are swingable about said one of their ends for movement to collapsed positions alongside and substantially parallel with said boom when the assembly is not in use.



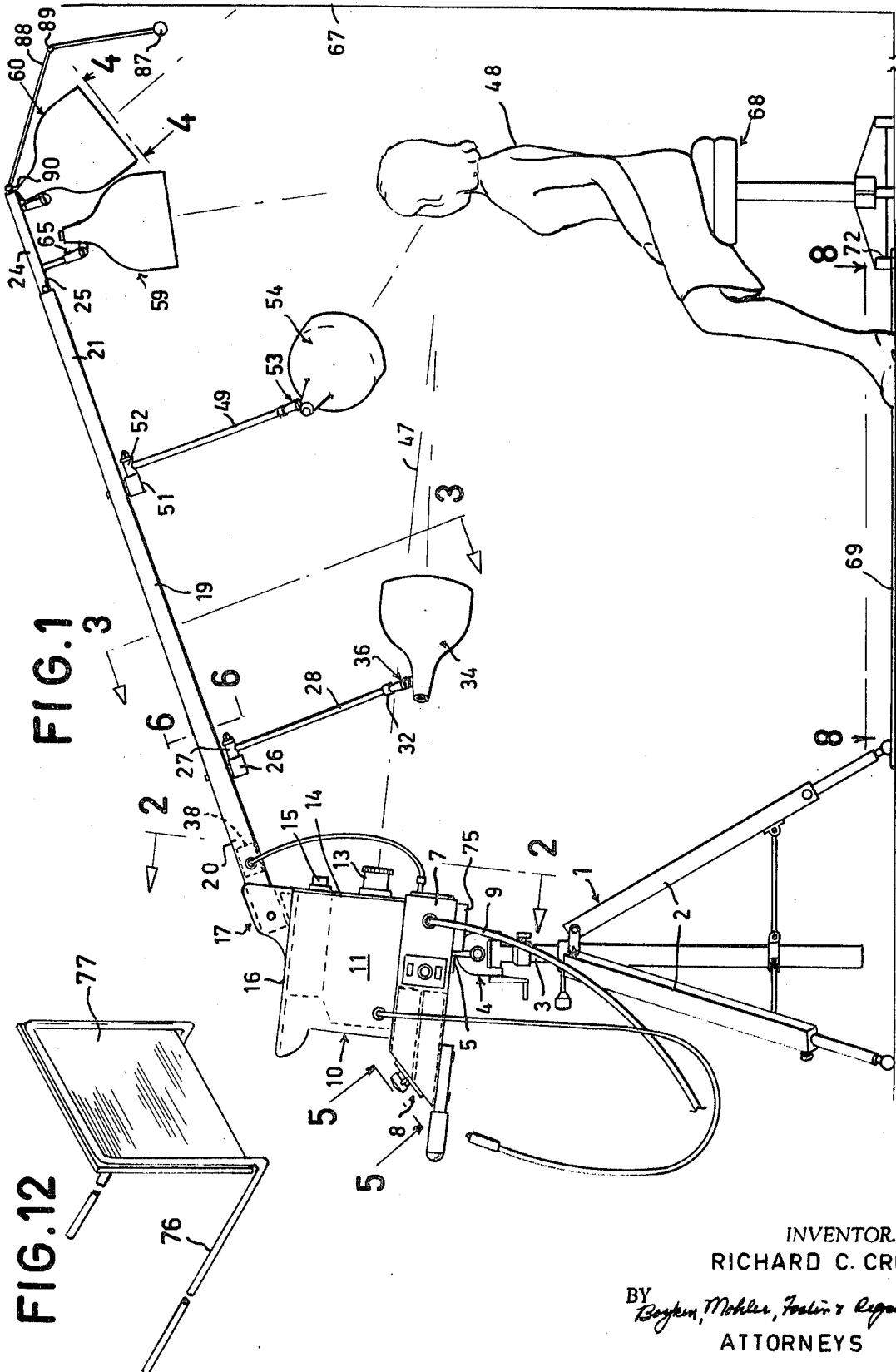
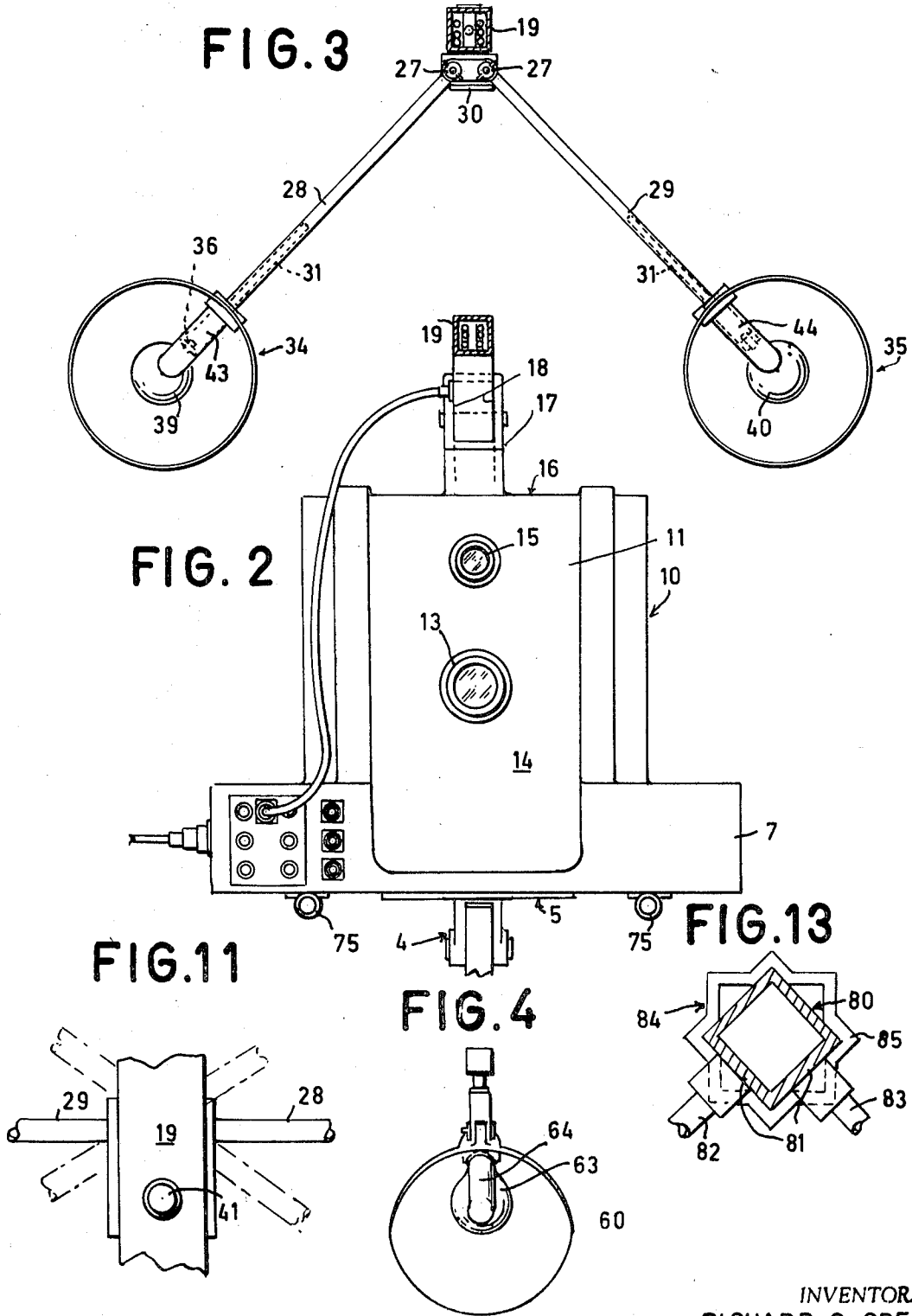


FIG. 12

FIG. 1

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FIG. 8



FIG. 9

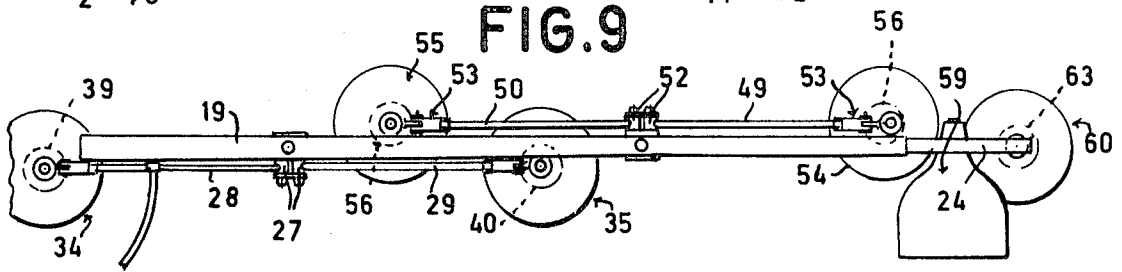


FIG. 10

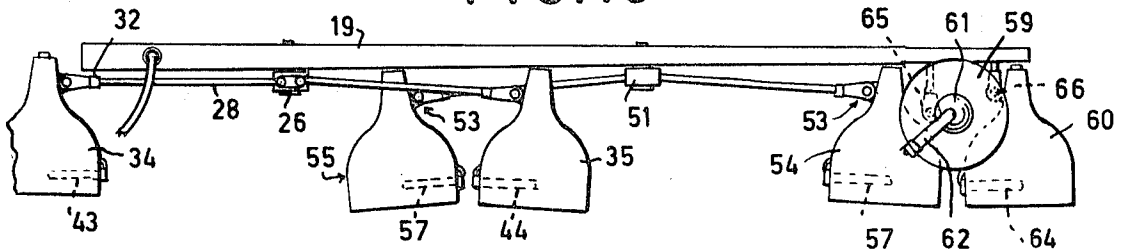


FIG. 7

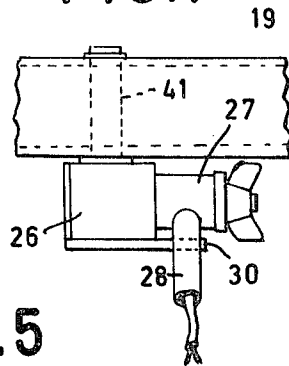


FIG. 6

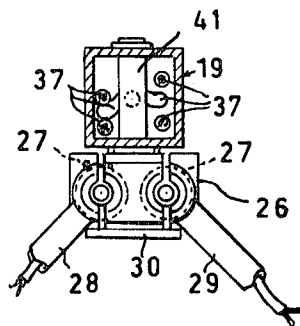
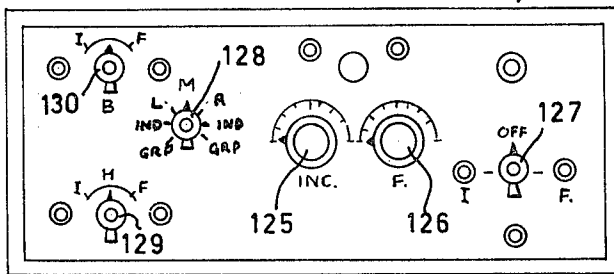


FIG. 5



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FIG. 14

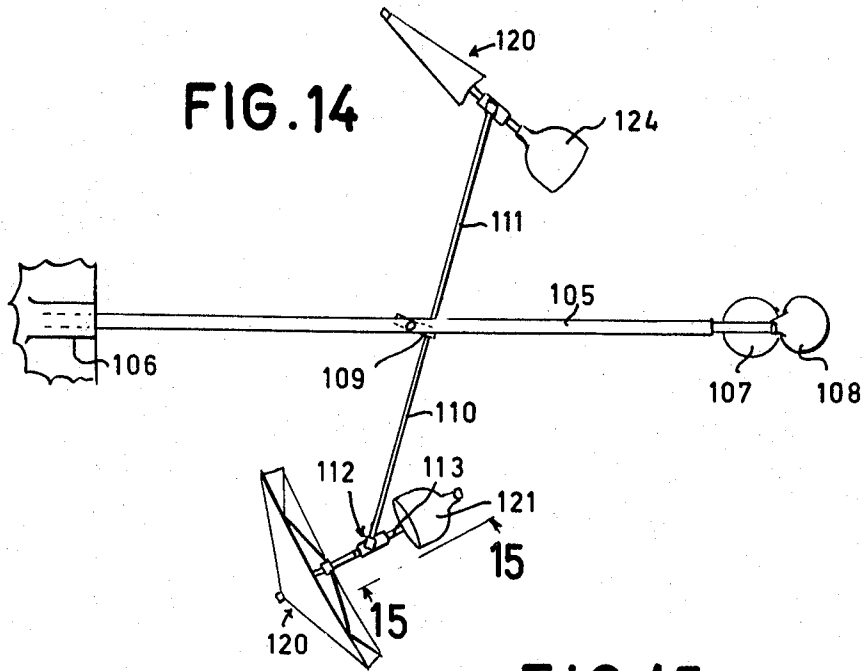


FIG. 15

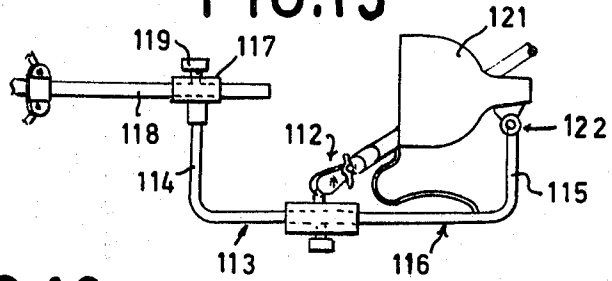
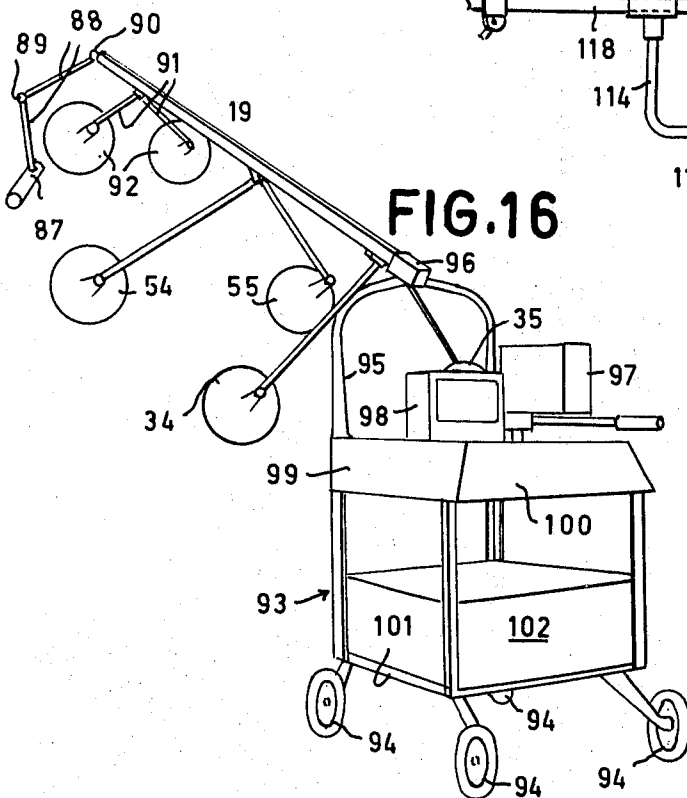


FIG. 16



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## PHOTOGRAPHIC LIGHTING ASSEMBLY

## BRIEF SUMMARY OF THE INVENTION

The present invention is an improvement on the lighting system disclosed in U.S. Pat. No. 3,258,585 wherein a plurality of separate lamps on separate arms are separately supported on a platform or table that, in turn, is supported on a conventional tripod.

In some instances it is desirable to use stroboscopic lamps, or quartz lights for television, or incandescent lamps. The present invention provides a complete assembly of lamps and a structure that enables substituting one assembly of one type of lamps for another, in accurate relation of the lamps to each other, and to the subject, in a matter of seconds.

In addition, the present invention provides a single boom-like support for supporting, in different combinations and relationships to each other, the lamps required for taking professional conventional photographic portraits of persons of different complexions with the head of each person in different positions and which boom is removably supported on a camera support in a fixed position relative to the latter and to the camera so as to eliminate misadjustment of the lamps on the support relative to the camera and subject means being provided in the combination for positioning the subject in a correct distance from the lamps and from the camera. Means is also provided for adjusting the lamps relative to the boom-like support for taking pictures of groups of persons at greater distances from the camera than in the case of single portraits, and for also taking simple identification portraits as distinguished from portraits posed for aesthetic or artistic qualities.

An added object of the invention is the provision of a camera, a case and a boom support rigid relative to each other for mounting on a tripod or other support, which boom support includes a single boom releasably supported thereon in a vertical plane in which the optical axis of the objective lens of the camera is positioned, with lamp supports extending to opposite sides of the boom for providing the lighting for a sitter in said vertical plane below the outer end of said boom.

A still further object of the invention is the provision of a single boomlike support having a pair of laterally projecting arms respectively projecting oppositely from said support, each arm provided with lamp and reflector supporting means at its outer end relative to said boom support for supporting a photographic lamp bulb and a reflector in spaced opposed relation thereto, with said arms pivotally swingable about their inner ends to bring the outer end of one closer to the sitter than the other and which lamp and reflector supporting means is supported on each arm for reflecting the rays from the lamp opposed thereto onto the sitter while the rays from the other lamp on the other arm are closer to and directly illuminate the face of the sitter, whereby only two lamps are adapted to provide a main light and a fill-in light for the portrait.

Other objects and advantages will appear in the description and drawings.

## BRIEF DESCRIPTION OF DRAWINGS

In the drawings,

FIG. 1 is a side elevational view of the lighting assembly including the support therefor and a subject in position for a portrait.

FIG. 2 is an enlarged, fragmentary, cross-sectional view at line 202 of FIG. 1.

FIG. 3 is an enlarged fragmentary cross-sectional view at line 3—3 of FIG. 1.

FIG. 4 is an enlarged fragmentary elevational view of the outer end lamp and reflector as seen from line 4—4 of FIG. 1.

FIG. 5 is an enlarged, fragmentary elevational view of the light control panel as seen from line 5—5 of FIG. 1.

FIG. 6 is an enlarged, fragmentary cross-sectional view at line 6—6 of FIG. 1.

FIG. 7 is a side elevational view of the portion shown in FIG. 6.

FIG. 8 is a top plan view of the seat positioner as seen from line 8—8 of FIG. 1.

FIG. 9 is a plan view of the boom and lamps of FIG. 1 separated from the boom support and with the lamps in collapsed position.

FIG. 10 is a side elevational view of the collapsed boom of FIG. 9.

FIG. 11 is a fragmentary top plan view of a portion of the boom and a pair of lamp supporting arms showing the arms in broken lines in different positions relative to the boom.

FIG. 12 is a perspective view of an attachment for the camera support of FIG. 1 for copying.

FIG. 13 is a fragmentary enlarged cross-sectional view through a modified form of boom.

FIG. 14 is a modification of the structure shown in FIGS. 1—10 having the minimum lighting requirements for producing professional portraits.

FIG. 15 is a fragmentary view along line 15—15 of FIG. 14.

FIG. 16 is a perspective view of an assembly specifically adapted for television.

## DETAILED DESCRIPTION

Referring to FIG. 1, a conventional studio tripod 1 that includes collapsible legs 2 supporting a vertically movable vertical post 3 having a head 4 at its upper end that is rotatable about the axis of the post, and which head includes a tiltable plate 5 for the camera.

A hollow, horizontally disposed circuit housing 7 is adapted to be removably secured on plate 5 by any suitable means, such as the usual screw for securing a camera on a tripod head, the bottom of the housing being tapped for such screw.

The aforesaid circuit housing 7 may be said to comprise the control box for the control of the electrical circuit in which the subject-illuminating lamps are connected and a control panel 8 (FIG. 5) carries the switches, signal lights and rheostat control knobs for said circuit as will be later explained more in detail, but at this point it is pertinent to note that only a single cord 9 connects said circuit with the main electrical source, said cord being removably connected at one end by a conventional plug in a socket on said base portion (FIGS. 1, 2).

Rigid with said circuit housing is the camera, generally designated 10, which includes a housing 11 that is rigid with and projects upwardly from said circuit housing 7 and which camera housing or box encloses the conventional camera mechanism therein and the objective lens 13 projecting from the front wall 14 (FIG. 2) and this will be the only lens in the event the camera mechanism is of the single lens reflex type having the conventional viewing glass for viewing the subject by the operator from the rear side of the camera. In the event the camera is of the type having a viewing lens 15, the latter may also be carried by front wall 14.

The housing 11 includes a top wall 16 having a boom support 17 projecting upwardly therefrom rigid therewith. Thus the boom support camera and circuit housing may be a unit that are fixed relative to each other.

The said boom support is formed with an upwardly and forwardly opening socket 18 (FIG. 2) that is preferably rectangular or polysided in cross-sectional contour to removably receive the rear end of a boom 19 of corresponding outer cross-sectional contour, and where the socket is rectangular in cross-sectional contour, the lateral sides are preferably vertical and the upper and lower sides are horizontal.

The words, "forward," "forwardly," "rear," and "rearwardly" and words of similar import are used with reference to the camera, the "forward" wall being the wall 14 having the objective lens 13, and the latter projects "forwardly" from said wall, while the rear side of the camera is the rear wall, and boom 19 projects forwardly and upwardly from the boom support 17.

Said boom 19 is hollow, being a box-boom, and the walls thereof at its rear and forward end portions 20, 21 may be parallel with the walls intermediate said rear and forward end

portions slightly tapering convergently from said rear end portion to the forward end portion so that the rear end portion will slidably fit in the socket of the boom support 17, while a telescopic hollow boom extension 24 will slidably be supported in the forward end portion 21. The walls of the extension 24 are parallel, and normally said extension 24 is in collapsed position as seen in FIG. 1, and carries a stop pin 25 projecting therefrom to function as a stop to engage the forward end of the portion 21 and to position the lamps on extension 24 for conventional portraits as distinguished from groups or standing figures.

Spaced forwardly of the rear end of boom 19, and the boom support 18, and below the lower side of the boom is an outlet box 26 that is supported on the boom for rotation about a generally vertically extending axis perpendicular to the boom. This box has a pair of hollow tubular supports 27 (FIGS. 6, 7) projecting from its forward side and which are supported on the box for rotation to different positions about parallel axes that, in turn, are perpendicular to the axis of rotation of the box 26.

One end of a straight, tubular lamp arm 28 is secured to one of the supports 27, and a second straight tubular lamp arm 29 is secured at one end to the other of said supports 27. A projection 30 on the box 26 projecting between the ends of arms 28, 29 that are adjacent to the box is adapted to function as a stop adapted to engage said arms when they are swung downwardly to positions extending angularly downwardly and outwardly relative to each other from said supports 27 (FIG. 3) for conventional portraits.

Each of the arms 28, 29 telescopically receives in its outer open end a straight, telescopically extensible tube 31 (FIG. 3) and a conventional tightening collar 32 (FIG. 1) on the outer end of each arm is adapted to releasably lock each tube 31 in any desired degree of extension and against rotation in arms 28, 29. Upon rotation of the collar in one direction, and the tube is released for extension or retraction upon reverse rotation of the collar.

Carried at the outer end of the extension tube 31 in arms 28 is a lamp reflector unit 34 and a lamp reflector unit 35 is carried on the outer end of the extension tube in arms 29 (FIG. 3). The term "lamp reflector unit" is intended to include a lamp in a conventional reflector or a reflector-type lamp and socket therefor, and movement of the reflector units to universal positions is effected by the provision of friction joint fitting 36 combined with the rotation of extension tubes 31, enabling angular adjustment of the reflector units relative to the longitudinal axes of arms 28, 29.

Sets of conductor cords 37 in boom 19 (FIG. 6) extend from terminals on an outlet box 38 (FIG. 1) in the inner or lower end of boom 19 to box 27, and through arms 28 and extension tubes 31 to the lamps 39, 40 (FIG. 3).

Conductors in one of cords 37 extend through the tubular pivot 41 supporting box 26 for rotation, and through the hollow supports 27, and in a conventional spring coil in each of the arms 28, 29 and extensions 31 to the sockets for lamps 39, 40.

Also supported within the reflectors of the reflector units 34, 35 are strobe or flash lamps 43, 44 (FIG. 3) connected by wires within arms 28, 29 and extensions 31, and boom 19 to outlet box 38 and to circuit box 7, the latter of which encloses the power pack for the flash lamps.

Lamps 39, 40 are the fill-in lights when only the incandescent lamps are used, or they may become modeling lights when the flash lamps are used, as will later be explained more in detail. When the arms 28, 29 are swung to their lowest positions, as seen in FIGS. 1 and 3, and the optical axis of the sitter 48 (FIG. 1) are in alignment, the lamps 39, 40 will normally be below said optical axis and they are directed toward the head of the sitter.

The position of lamps 34, 35 at opposite sides of the optical axis 47 are normally substantially equal distances from said axis and from the head of the sitter, and are out of the range of lens 13. The single boom, as distinguished from a plurality of

separate arms, is one means that enables the photographer to quickly position the boom, lens of the camera, and the head of the sitter in substantially the same vertical plane, or to quickly note if they are not in said plane. In other words, it provides a quick and accurate sighting means.

The "inner" end of the boom is the end that is supported on the camera housing, while the "outer" end is the elevated end remote from said housing, hence the use of the words "inwardly" and "outwardly" with respect to the elements carried by the boom are used with respect to its inner and outer ends.

Spaced outwardly of the set of lamp arms 28, 29, the boom 19 supports a substantially corresponding set of arms 49, 50 in the same manner as for arms 28, 29, there being an outlet box 51 below and pivotally supported for swiveling about an axis that is perpendicular to the boom, and arm supports 52 corresponding to arm supports 27 for swinging the arms vertically. Tubular lamp arms 49, 50 are respectively secured at one of their ends to each support 52 and extend divergently downwardly therefrom when a portrait is being made, with tubular extensions corresponding to extensions 31 telescopically fitted therein for extension from the outer ends of said arms, said extensions having friction hinge fittings 53 at their outer ends connected with reflector units 54, 55 (FIG. 9) respectively carried by arms 49, 50, each including a socket having a main incandescent light bulb 56 therein, and a strobe or flash-bulb 57 (FIGS. 9, 10).

A positioning member on outlet box 51 corresponds to the member 30 (FIGS. 6, 7) on outlet box 26 and functions in the same manner and for the same purpose, namely, as a limit means to position the reflector units 54, 55 out of the range of the objective lens and at proper distances from the head of the sitter. The reflection units, like the units 34, 35, are directed toward the head of the sitter when a conventional portrait is being made.

Carried on the outer extension 24 is a pair of lamp reflector units 59, 60, (FIGS. 9, 10), the unit 59 including an incandescent lamp 61 and a strobe light 62 that is to illuminate the hair of the sitter from above, and is therefore called the hair light, while unit 60 includes an incandescent lamp 63 and a strobe light 64 is to illuminate a background drop and is called the background light.

Friction hinge fittings 65, 66 (FIGS. 10) substantially like fittings 36, connect the reflector units 59, 60 with the extension 24 and enable moving the units so that the unit 59 will be directed downwardly onto the hair of the sitter 48 and so that unit 60 will be directed against the back drop 67.

In the taking of a portrait of sitter 48 (FIG. 1) it is important that the head of the sitter be at the correct distance from the camera and from the lamp units on the boom 19, and also that the lamp units be in the correct relation to the head.

The stool 68, for sitter 48, is adjustable for height and a flat strap or elongated member 69 (FIGS. 1, 8) has an opening 70 in one end in which the caster on the forward leg 2 of tripod 1 is adapted to be positioned, while opening 71 on the other end of strap 69 is adapted to recess one of the floor engaging supports 72 of the stool support. The leg of the tripod and the support on the stool are nearest to each other when in said openings, and at that time the sitter on the stool will be at exactly the right distance from the camera and the head of the sitter will be in the correct position and distance from each of the main and fill-in light units and the hair-lighting unit. The background light will illuminate the background drop 67.

The angle of the boom relative to the optical axis of the main lens 13 is automatically fixed, and upon raising and lowering of the head supporting the camera, for different height persons will merely raise and lower the light units without disturbing their correct positions relative to the sitter.

In the event a picture is to be taken of a group at a greater distance from the camera than the length of the strap 69, the arms supporting the light units may be extended to provide a uniform illumination of the group.

In portrait use, for a seated person as illustrated in FIG. 1, the boom 19 and the strap or element 69 will be in substan-

tially the same vertical plane, a position readily apparent to the photographer at the camera, and as the lamps 34, 35 and 56, 57 are normally symmetrically positioned at opposite sides of said plane and at their lowermost positions, and as the stool 68 is held by the strap 69 below the hair and background lamps, it is seen that the correct arrangement is achieved without shifting the lamps, stool or camera. The camera box itself in FIGS. 1, 2 supports the boom so that the relationship between the camera and boom is fixed.

However, where group photographs are to be taken, or where photographs of standing persons are to be taken, the arms 28, 29 and 49, 50, as well as support 24, may be extended to provide a wider distribution of light and arms 28, 29 as well as arms 49, 50 may be swung to different positions about the generally vertically extending pivots 41 and to different positions about the horizontal pivots or supports 27 to extend the scope of the combination to requirements beyond that of merely conventional portraits of seated persons.

The housing 7 may be provided with means for supporting the copy holder of FIG. 12, the latter which means may comprise a pair of parallel, generally horizontally extending tubular members 75 (FIG. 1) having forward open ends for slidably receiving the rear end portions of a pair of horizontally disposed arms or rods 76 (FIG. 12). An upstanding board or copy holding plate 77 is supported upright on the forward ends of arms 76 for holding the material to be copied along the optical axis 47 in a position forwardly of the camera, and of the fill-in lamps 39, 40 for illumination of the material to be copied. Obviously the lamps other than the fill-in lamps would not be employed for copying material on support 77.

FIG. 13 shows a modification of the boom and the arms carrying the lamps, where the arrangement of the boom and arms correspond to the arrangement shown in FIGS. 1, 2 but in which the use of the unit is restricted to the taking of portraits of seated persons or for copying.

In the modification the boom, generally designated 80 has two of its flat sides 81 convergently inclined downwardly (in cross-sectional contour) at angles of 45° to meeting relation in a vertical plane bisecting the boom longitudinally of the latter. The boom is preferably square in transverse cross-sectional contour, the same as boom 19, and the arms 82, 83 that correspond to arms 28, 29 and 49, 50 extend oppositely outwardly of the boom and normal to flat sides 82, 83 but are rigidly secured to the boom at their inner ends. Otherwise the arms and boom carry reflectors and lamps the same as in FIGS. 1, 2 except that the hair and background lamps may be secured directly to the outer end of the boom 80.

Socket member 84 at the camera housing is formed with eight equally spaced corner portions 85, instead of only four, thus enabling a boom 19 to replace boom 80. The structure illustrated in FIG. 13, and as described, is more economical to make than that of FIGS. 1-10 but is more limited as to use, but the positioning of the reflector units and lamps is fixed with relation to the sitter. In instances here the lighting assembly is to be used by different persons with little, if any, experience in portrait photography, the structure provided in FIG. 13 enables the taking of professional quality portraits with the chance of error reduced to the minimum. The arms supporting the reflector units are fixed against accidental movement thereof, and the positions of the reflector units on the arms could be fixed relative to the stool, the position of the latter itself, and consequently the sitter, being fixed relative to the camera by the strap 69.

Where the assembly of FIG. 1 is used for television purposes, the conventional quartz lamps are substituted for the incandescent lamps that are in the reflectors, and a microphone 87 is connected to and projects from the outer end of boom 19 or the extension 24 thereof by arms 88. Said arms may be pivotally connected to each other at 89 at one of their ends. One end of one of the pair of arms is pivotally connected at 90 to the outer end of said boom or extension 24, and the end of the other end remote from pivot 89 carries the microphone 87. Thus the microphone will always be in a

proper receiving position relative to the principal subject of the broadcast since the latter is below the outer end of the boom.

Preferably, where the lighting assembly is to be substantially restricted for television use, the boom 19 (FIG. 16) including the microphone 87 therein, the lamp reflectors 34, 35, 54, 55 with quartz lights therein are on a wheel mounted carriage adapted to be quickly wheeled to follow the subject being photographed. Also, instead of the hair and back lights 59, 60 of FIG. 1, arms 91 similar to arms 49, 50 support the reflector units 92 adjacent to the outer end of the boom 19, although reflectors 60, 61 are adjustable and a boom and light assembly such as shown in FIG. 1, without change, gives good results.

Carriage 93 is supported on wheels 94, being readily movable to follow movements of a speaker or a group.

An upstanding support 95 on the forward end of the carriage includes a socket member 96 rigid on said support into which the inner end of the boom 19 is held. This socket member substantially corresponds to the member 18 in FIG. 1 except that it is on the support 95.

The carriage 93 has an upper platform that supports a conventional television camera 97 and a monitor 98, and said upper platform may be a housing 99 corresponding to housing 7 in FIG. 1 that contains the electronics for the lights and their controls. A control panel 100 on the housing 99 carries the manual controls and signals.

A lower platform 101 may carry a conventional video tape recorder 102.

It should be noted that heretofore, in the taking of television pictures, lamp stands, each having its separate cord attached thereto, are spotted in different positions, and the television camera, monitor and tape recorder each have an operator in different places while separate cords connect the video tape recorder and the camera and monitor while another cord extends to the microphone that, in turn, is moved with the subject. In the present instance the carriage or dolly 93 with only one cord connecting it with the source of electricity carries the entire assembly and is moved to not only correctly illuminate the subject at all times, but to also position the microphone for substantially uniform reception.

The control panel includes switches in the circuit to the lamps to actuate only those required, as there are instances where all are not necessary, but in any event, the boom will support whatever lamps are used in the desired locations for whatever effect is to be produced.

As seen in FIG. 16, instead of the hair light and background light, a pair of reflectors 91 on arms 92 that are shorter than arms 49, 50 of FIG. 1 may be used. The reflectors 91 and the other reflectors may carry the quartz lamps that are required for television.

Referring specifically to FIGS. 14-16, a boom 105, corresponding to boom 19 of FIG. 1 is supported at its lower end in a socket member 106 that may correspond to socket member 18, hence boom 105 may be substituted for boom 19. Boom 105 may have reflector units 107, 108 on its outer end to provide hair and background lights.

Spaced intermediate the inner and outer ends of the boom 105 is a support 109 that corresponds to the arm supports 26 and 51 of FIGS. 6, 7, and tubular arms 110, 111 are supported on said supports in the same manner as described for arms 49, 50, so that said arms may swing generally horizontally about a generally vertical axis at the boom, and they may also swing independently of each other up and down about horizontally extending axes also at the boom.

Arms 110, 111 are of corresponding structure; hence, the description of arm 110 will suffice for arm 111.

The outer end of arm 110 is pivotally secured by a conventional ball and socket or universal joint 112 (FIG. 15) to a generally horizontally extending and horizontally elongated tubular member 113 having upstanding end portions 114, 115, joint 112 being spaced between said end portions. The member 113 and its end portions provide a generally U-shaped bracket, that may be tilted and swung about the joint



112. The U-shaped bracket itself may be generally designated 116.

Supported on the upper end of the upstanding end portion 114 is a horizontally extending sleeve 117 through which a rod 118 slidably extends, and which rod may be held in adjusted position longitudinally thereof, relative to sleeve 117 by a set screw 119.

A conventional umbrella type reflector 120 (FIG. 14) is centrally secured on the outer end of rod 118 that is remote from bracket 116. The rod 118 extends from the inner or generally concave side of the reflector, which side has the reflective surface, and said reflector is collapsible for folding against the rod 118, (FIG. 14).

A reflector lamp unit 121 is secured on the upper end of the upstanding portion 115 of bracket 116 that is opposite to the umbrella reflector 120 by a joint 122 corresponding to the connector support 53 for the reflector unit 54 of FIG. 1 and said swivel joint supports the reflector unit 121 for swinging from a position in which said unit is coaxial with and faces the umbrella reflector 120 to a position in which it faces in an opposite direction, and vice versa. The joint 122 may be a conventional ball and socket joint or the like, such as are usual for supporting reflector units for swinging in different directions.

The electric wires may be in a cord extending through arm 110, past the ball and socket joint 112 and to and through the bracket 116 to the lamps in the reflector unit, the latter corresponding to reflector unit 54.

In taking a normal portrait of a sitter, the reflector unit 122 on arm 111, for example, is positioned so that the direct rays from the unit are directed onto the head of the sitter, with the head facing generally away from the unit, and outer end of arm 111 is swung upwardly and closer to the head than arm 110, while the latter is swung downwardly and away from the sitter with the reflective surface of the umbrella reflector directed toward the head of the sitter. The reflector unit 121 is moved to face the umbrella reflector and is substantially coaxial with the latter.

By this arrangement the reflector unit 121 on arm 111 becomes the main light, corresponding substantially to the reflector unit 55 of FIG. 1 and the reflector unit 121 on arm 110 with the umbrella reflector 120 become the fill-in light.

A change in the positions of the arms 110 and 111 and a reversal of the positions of the reflector units, so that reflector unit 121 on arm 110 becomes the main light and the reflector unit 121 and umbrella reflector 120 become the fill-in light, is all that is required where the head of the sitter is in an opposite position or generally facing away from the unit 121 on arm 110.

By the above arrangement the fill-in reflectors 34, 35 in FIG. 1 are not required, and the quality of the portrait is at least the equivalent of one where separate fill-in reflectors 34, 35 are used, and is superior in many instances.

The horizontal and vertical swinging of the arms 110, 114 enable positioning a reflector 120 at one side of the boom, and the lamp 121 or 124 at the other side of the boom at the correct positions for a portrait with the reflector functioning as a fill-in light and one lamp functioning as a main light.

With respect to the boom structure of FIGS. 1-10 and 14-17. In each of these forms of the invention the light supporting arms and reflectors are adapted to be collapsed to positions substantially as shown in FIGS. 8-10 in which they are positioned relatively close to the boom, enabling the boom and lights to be safely carried by a person and to be stowed in a vehicle for transport separately from the tripod to a place remote from the studio.

Heretofore, the taking of portraits for school or other publications has required the members whose portraits are to be taken to visit the photographer's studio where separate lamp stands are shifted to provide the desired lighting. The portraits taken under such conditions many times lack the desired uniformity in size and lighting to make an attractive page of portraits, inasmuch as the portraits may be taken at intervals interspaced with the taking of other portraits including stand-

ing and group pictures wherein changes are made in the lighting arrangement and distances of the subject from the camera.

The securing of the boom to the tripod or camera, as in FIG. 1, takes no longer than to secure a camera on a tripod, and even less, since the boom is merely seated in the socket and in less than a minute the stool may be positioned relative to the camera and the arms and reflectors positioned.

With the arrangement shown in FIGS. 14-16 even fewer lights require positioning, and the diffusion of reflected light from the umbrella reflector also enables a variation in intensity merely by positioning the bracket 116 so that the intensity of the light rays striking the subject may be varied relative to the full intensity of the main light or by moving the reflector 120 different distances from the reflector unit 121 or by different positions of the arm supporting the reflector relative to the position of bracket 116.

With respect to the control panel shown in FIG. 5, the manually actuatable control knobs are shown, the electrical circuits in the control box 7 being controlled thereby.

The incandescent lamps and the stroboscopic or "strobe" lamps are in circuits with the fill-in lamps controlled by rheostats connected with knobs 125, 126, the former being in the circuit for the fill-in incandescent lamps and the latter for the fill-in stroboscopic lamps. When the main switch 127 is turned to F or for using the strobe lamps, and the switch knob 128 is turned counterclockwise to the left to point to "IND" for an individual portrait, with the face of the sitter facing to the right, as viewed from the camera, the right-hand incandescent main light and the left-hand incandescent fill light will be actuated for purpose of modeling the face. The knob 125 is connected with the rheostat in the circuit to the fill lamp, and said rheostat will be actuated to build up the desired intensity of the left-hand fill light, after which the knob 126 will be set to agree with the setting of knob 125 so that the desired intensity of the strobe fill light will be produced when the shutter of the camera is actuated.

If the sitter is facing toward the left, then knob 128 will be turned counterclockwise to the left, and the left main lamp and right fill lamp will be actuated.

For individual portraits, the knob 129 will be turned to the right to F and the knob 130 will also be turned to the right to F. Neither the hair nor back lamps are in the circuit with the rheostats, and both are off when knob 128 is turned to "GRP." for group pictures.

Also, when knob 128 is turned for taking group pictures the fill-in lamps will be off and the intensity of the main lights is increased by manipulation of the rheostat 126 or 125 according to whether the incandescent or strobe lamps are to be used. If desired, the arms 49, 50 may be swung about the vertical pivot for outlet 51 so that one main light may function as a fill-in light.

The electrical circuits controlled by the manually actuatable knobs will be apparent to anyone skilled in the art, hence are not shown.

On FIG. 8 the letters "I" and "F" indicate "incandescent" and "flash" and "B" and "H" represent background lamp and hair lamp. "IND." means "individual" and "GRP" means "group."

I claim:

1. A photographic lighting assembly comprising;
  - a. a single, elongated, boom having an inner end and an outer end opposite thereto,
  - b. boom-supporting means for supporting said boom at its inner end in a position inclined upwardly from said inner end with its outer end spaced above and in approximately the same vertical plane as the location of a person to be photographed and said boom-supporting means including a camera support spaced below said inner end of said boom adapted to support a camera adjacent to and below said inner end of said boom with its lens directed toward said location,

- c. a pair of arms, and arm-supporting means securing one of the ends of said arms to said boom at a point intermediate said inner and outer ends of the latter with said arms extending to opposite lateral sides of the boom,
- d. illuminating means on the outer ends of said arms remote from said boom each comprising a (photoelectric) lamp and a reflector on the outer end of one arm in spaced opposed relation to each other, and a lamp and a reflector on the outer end of the other arm in spaced opposed relation to each other,
- e. lamp-supporting means supporting each lamp for movement from a reflecting position for directing its rays into the reflector opposed thereto for reflection of said rays by said reflector toward said location, to a direct projecting position in which said rays are directed away from said reflector, and toward said location,
- f. said arm-supporting means supporting said arms for vertical swinging of their outer ends independently of each other to different levels relative to a person in said location and for swinging said outer ends horizontally to different distances from such person, whereby either of said illuminating means when in said reflecting position may be spaced from a person in said location to function as a fill-in light and the other illuminating means, when in said direct projecting position, may be differently spaced from such person to function as a main light, with said illuminating means being spaced from opposite sides of a vertical plane in which said boom is positioned.
- 2. In an assembly as defined in claim 1;
- g. illuminating means on the outer end of said boom spaced above a person in said location for illuminating the hair on the head of said person and for illuminating a background behind such person.
- 3. In an assembly as defined in claim 1;
- g. the reflector of each illuminating means being of the collapsible umbrella type having a generally concave reflecting surface facing the lamp opposed thereto when the lamp is in a reflecting position and said reflector is expanded,
- h. said arms being rigid against bending whereby the paths of movement of their outer ends and of said illuminating means will be fixed relative to the arm-supporting means at said boom.

- 4. A photographic lighting assembly comprising;
  - a. a single elongated tubular boom having an inner terminal end and an outer terminal end,
  - b. boom-supporting means for supporting said boom at its inner end in a position inclined upwardly from said inner end,
  - c. a pair of arms secured to said boom at one of their ends and projecting laterally oppositely outwardly from said boom from a point intermediate said inner end and said outer end,
  - d. electric illuminating means on the outer ends of said arms for illuminating the subject to be photographed,
  - e. said boom-supporting means being adapted to support a camera thereon in a position spaced below said inner end of said boom with the optical axis of its objective lens in substantially the same vertical plane with said boom and with its lens directed to the same side as said boom,
  - f. said illuminating means being in positions for directing rays of light toward a point between said upper end of said boom along said optical axis and onto the subject to be photographed when such camera is supported in said position on said boom-supporting means,
  - g. said boom-supporting means comprising a control housing that includes a camera support for such camera and an upwardly projecting boom support rigid with said camera support to the upper portion of which said inner end of said boom is secured,
  - h. an electrical circuit in which said illuminating means is connected including electrical wires extending from said illuminating means through said arms and said boom to said control housing,
  - i. means securing said one of the ends of said arms to said boom for swinging the outer ends of said arms about axes that are perpendicular to each other for swinging said illuminating means to different heights relative to the ground and for swinging said illuminating means toward and away from the subject to be photographed when said subject is in a position below the outer end of said boom.
- 5. In a photographic assembly as defined in claim 4;
- j. said means securing said one of the ends of said arms to said boom also supporting said arms for swinging to positions alongside said boom to a collapsed position.

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