

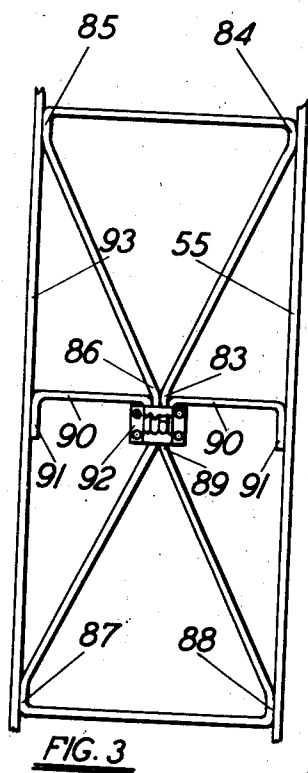
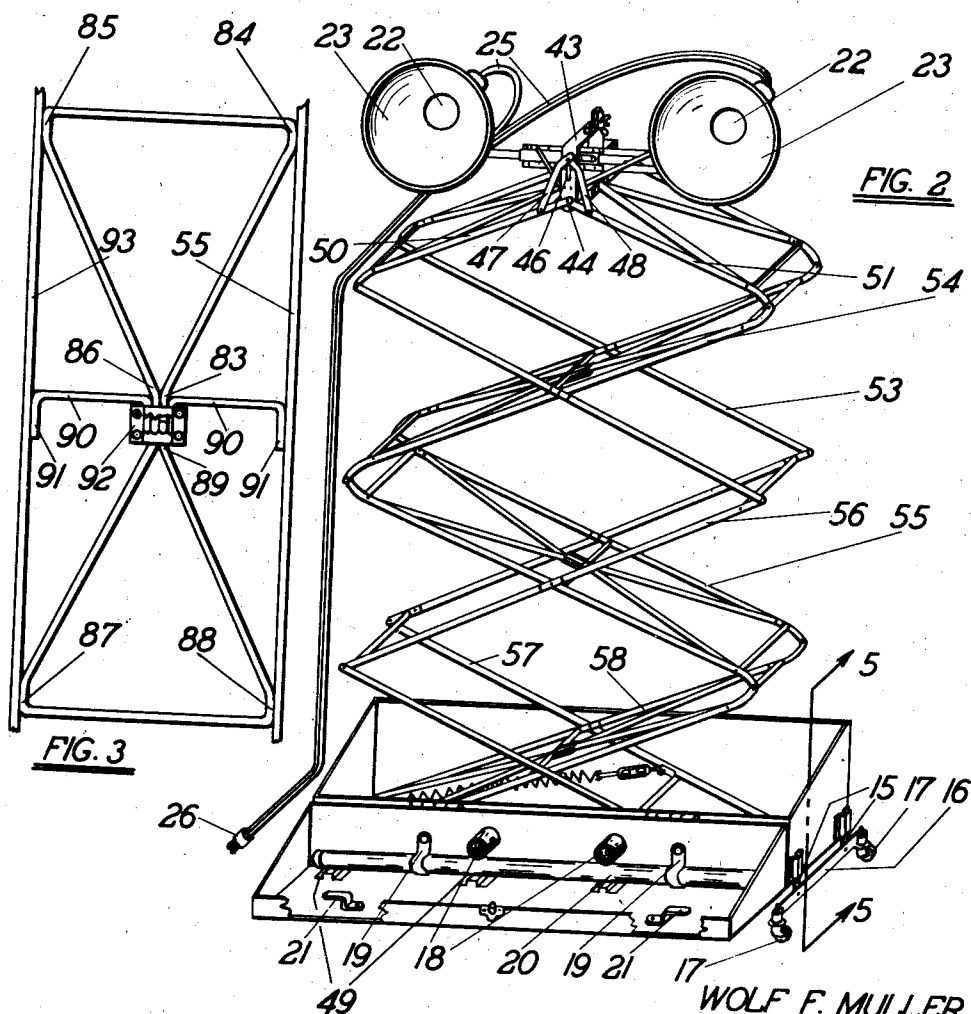
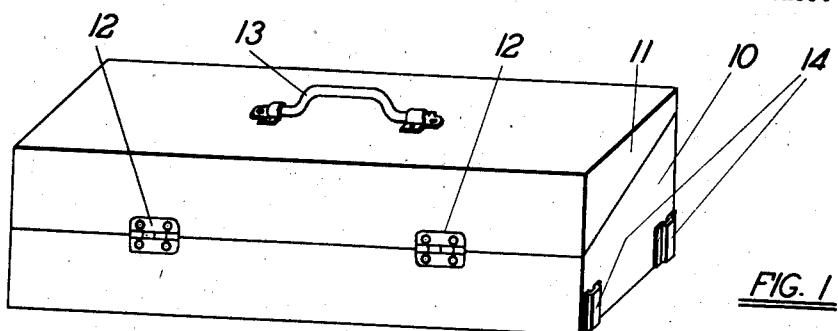
June 9, 1942.

W. F. MULLER
PORTABLE LIGHT STAND

2,285,868

Filed Aug. 2, 1940

2 Sheets-Sheet 1



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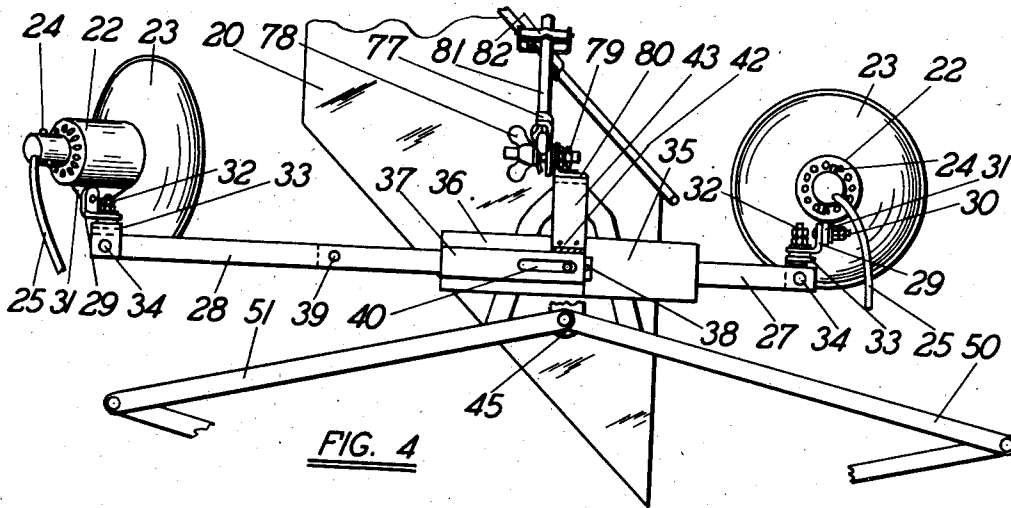


FIG. 4

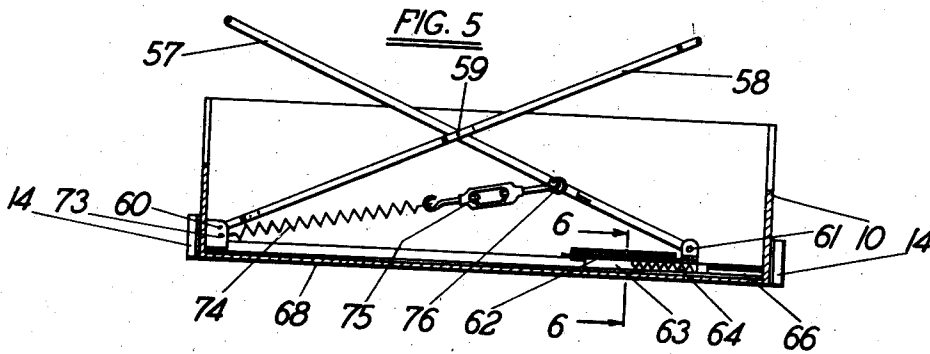


FIG. 5

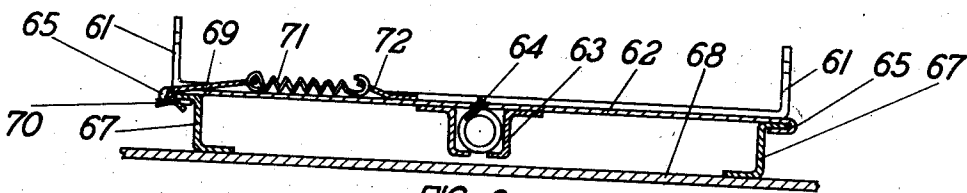


FIG. 6

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PORTABLE LIGHT STAND

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Application August 2, 1940, Serial No. 349,835

4 Claims. (Cl. 240—1.3)

My invention relates to a portable photographic light stand and more particularly to a light stand which is adjustable to any desired position.

Various light stands have been known in the prior art which permitted limited adjustment of the lamps themselves in one direction. Such light stands were of course extremely limited in their application. For photographic purposes it is extremely desirable that a light stand be provided which will permit vertical and horizontal adjustment of the lights without the sacrifice of economy of space and ease of operation. Light stands have also been known in which two or more lighting units were provided. These lighting units, however, were placed in a fixed position relative to each other and could not be adjusted laterally for the elimination of undesirable shadows or the like. Finally the prior art light stands have been bulky in construction and difficult for the photographer to carry from place to place as the need arose.

With these difficulties of the prior art constructions in view, it is accordingly one object of the present invention to provide a portable light stand which can be completely enclosed in a handy carrying case forming a part of said stand.

It is another object to provide such a light stand with means for positioning the lighting units at any desired vertical distance above the floor.

Still another object of the invention is to provide a pantograph connection between the base member and the lighting units of such a stand, said pantograph being adjustable vertically to the desired positions.

A further object is to provide novel spring means for holding the pantograph in whatever position it is placed.

A still further object is to provide two lighting units on such a stand, which may be adjusted laterally and rotatably with respect to each other.

An additional object is to provide a diffusing screen in connection with said lighting units.

Other objects and advantages of this invention will be readily apparent from the following description and claims.

In the drawings forming a part of this application, and in which like reference characters indicate like parts:

Figure 1 is a perspective view of the portable light stand with the carrying case in closed position;

Figure 2 is a view of the stand with the lighting

units in elevated position and the carrying case open;

Figure 3 is a detail view of one of the lazy tong arms in the pantograph unit;

Figure 4 is an enlarged rear view of the laterally and rotatably adjustable lighting units and diffusing screen;

Figure 5 is a detail view of the base member showing the spring means for holding the pantograph in its adjusted position; and

Figure 6 is an enlarged sectional view on the line 6—6 of Figure 5.

In order that those persons skilled in the art may fully understand the nature and scope of the present invention, I shall now give a detailed and concise description thereof with particular reference to the above mentioned drawings. As shown in Figure 1, the stand consists of a base member 10 made in the form of a carrying case. A suitable cover 11 is hinged to said base at 12. The cover is provided with a carrying handle 13 for ready transportation of the unit from place to place. At each end of this base member 10 there are sockets 14 which receive the projecting lugs 15 on a caster unit 16. This caster unit 16 has the usual rotatable casters 17 thereon.

On the inside of the cover 11 (see Figure 2) various additional accessories may be mounted. Thus there are two sockets 18 in which bulbs for the lighting units may be carried. Carrying straps 19 are also provided for holding the diffusing screen 20. Brackets 21 may be employed for holding the light cord 25. Additional brackets 49 corresponding to brackets 14 may also be provided within said cover for holding the caster units 16 when these units are removed from the outside of the case.

The lighting units according to the present invention consist of two light sockets 22 provided with suitable reflectors 23. The sockets are provided with individual switches 24 and electric cords 25. These electric cords terminate in a suitable socket 26 which may be connected to any source of current. The sockets 22 are mounted on laterally adjustable slides 27 and 28 by means of universally adjustable brackets 29. Thus the sockets are provided with downwardly extending flanges 31 which are pivoted to brackets 29 by the horizontal bolts 30. Brackets 29, in turn, are pivoted to the fixed brackets 33 by the vertical bolts 32. The fixed brackets 33 are firmly connected to the ends of slides 27 and 28 by rivets 34 or other desired means.

Slides 27 and 28 are carried by the channel

member 35 which in turn is mounted on the supporting member to be described below. Member 35 has a plate 36 on each side thereof, said plates 36 being provided with channels 37 in which the slides are horizontally movable. A stop lug 36 is provided at the end of each slide to limit the possible lateral separation of the lighting units. The slides are also provided with recessed portions 39 which cooperate with the spring latch elements 40 to determine the relatively retracted position of said units.

The channel member 35 is fastened to a vertically extending portion 42 of the supporting member 43. This supporting member 43 has downwardly extending front and rear arms which are pivoted at their lower ends 44 and 45 to the upper lazy tong arms 50 and 51 of the pantograph unit.

In order to maintain the supporting member in vertical position at all times, the front vertical portion above mentioned is provided with a vertical slot 46 in which the upper ends of braces 47 and 48 are slidable. The lower ends of these braces are pivoted to the lazy tong arms 50 and 51 respectively. It will be apparent from this construction that the supporting member 43 will be held in an upright position at all times regardless of vertical adjustment of the pantograph unit.

The vertically adjustable pantograph unit will now be described in greater detail. The top lazy tong arms 50 and 51 which are pivoted to the supporting member 43 at their upper ends, are further pivoted at their lower ends to the additional lazy tong arm units 53 and 54 respectively. Units 53 and 54 are pivoted to each other at their respective centers and are pivotally connected to the next succeeding lazy tong units 56 and 55 respectively. Units 56 and 55 are in turn pivoted to each other at their centers and are further connected at their lower ends to the bottom lazy tong units 57 and 58. Units 57 and 58 are similarly pivoted to each other at their centers 59.

One of these lower units 58 is pivoted at 60 to one end of the carrying case or base member 10. The remaining bottom unit 57 is pivoted at 61 to a suitable slide 62 which is movable along the base member 10 on tracks to be described in a moment. This slide 62 (Figures 5 and 6) is provided underneath its center with a channel 63 in which is mounted a spring 64. The channel 63 has a slot as shown in Figure 6 in which a suitable lug 66 at one end of the base member 10 may project. It will thus be apparent that as the slide moves to the right in Figure 5, the lug 66 will enter the channel member 63 and will engage and gradually compress the spring 64.

Slide 62 is provided on each side with downwardly and inwardly turned flanges 65 which are adapted to cooperate with the outwardly turned flanges of suitable track members or slides 67. These track members 67 are fastened to the bottom 68 of base member 10.

The track members 67 extend from one end of the base member to the other and permit sliding movement of member 62 toward and away from the pivot 60 of the lazy tong arm 58. As the slide moves toward said pivot 60, the lazy tong arms 57 and 58 will be brought to a greater and greater angle with respect to the base and will cause corresponding movement of the remaining units of the pantograph to raise the supporting member 43 and lighting units to

the desired elevation. In order to hold the slide 62 at any adjusted position along the tracks 67, I have provided a brake 69 provided with a downwardly turned flange 70 engaging said track. This brake 69 is mounted on the slide itself and is held against the track by the spring 71 fastened to the slide member at 72. In addition to the brake means, which is effective at all positions of the slide, I have provided an additional spring member 74 fastened to the base member at 73. Point 73 is relatively near the pivot 60 of lazy tong unit 58. The remaining end of spring 74 is connected to a turnbuckle 75 which is fastened at 76 to the other lazy tong unit 57. The turnbuckle may be used to adjust the tension of spring 74 as desired. It will be apparent from Figures 2 and 5 that spring 74 will be effective to retain the pantograph unit in its erected position as long as arms 57 and 58 form a substantial angle with respect to the bottom 68 of base member 10.

As the arms approach their collapsed horizontal position, however, spring 74 will be less and less effective. It would therefore be impossible to maintain the lighting units at a relatively low vertical position except for the additional spring means 64 previously mentioned. Thus as the arms 57 and 58 approach their collapsed position, the spring 64 will be engaged by lug 66 and will hold the pantograph unit in its adjusted position against the weight of the lighting units and lazy tong arms, which weight tends to collapse the pantograph unit. Lug 66 is positioned to engage spring 64 just as the spring 74 begins to lose its effectiveness due to the decreased angle between arm 57 and the bottom 68.

By this double spring arrangement just described, it is possible to retain the lighting units at any desired elevation above the base member 10. Such a result could not be achieved by the single resilient means used in various prior art constructions.

With reference to Figure 4, the supporting member 43 is provided with a suitable clamp or holding member 77 for a diffusing screen unit. Clamp 77 is tightened by the locking nut 78 and is pivoted by a suitable bolt 79 to an upwardly extending flange of bracket 80. Bracket 80 is in turn pivoted to the supporting member 43 for movement about a vertical axis. Bracket 80 accordingly permits universal adjustment of a carrying rod 81 for the diffusing screen holder 82. Holder 82 likewise includes a universal joint which permits movement of the diffusing screen 20 in any desired direction.

From the foregoing description of the lighting units and the diffusing screen holding means, it will be seen that the lighting units may be laterally adjusted between relatively retracted and extended position. When said lighting units are in their retracted positions, they will function substantially as a single light source, particularly when the diffusing screen 20 is placed in front of them. When the units 22 are placed in their extended positions, on the other hand, they will function as separate sources of light and can be universally adjusted to light any desired portions of the subject in order to obtain the proper shadow effects.

In order that the pantograph unit may have the necessary rigidity and strength, I have also devised a novel lazy tong arm unit of improved structure. This unit, as shown in Figure 3, consists of the side arms 55 and 93 which may

be pivoted at their respective ends and centers to additional lazy tong arm units of the same or different construction. These side arms 55 and 93 are held in their relatively separated position by suitable bracing means now to be described. My novel brace consists of a single piece of metal one end 83 of which is positioned midway between the centers of the respective side arms. The brace extends from this central point diagonally to one end of arm 55 and is connected thereto at point 84. The brace is bent at this point and extends directly across to the second side arm 93 and is fastened to one end of said arm at 85. From this point the brace extends diagonally back to the central point 86 adjacent the end 83 of the brace. From here the brace again extends diagonally back to the other end of arm 93 to which it is fastened at 87. From point 87 the brace extends laterally across to the other end of arm 55 and is fastened thereto at 88. From point 88 the brace extends diagonally back to the central portion 89 where said brace terminates. As shown in Figure 3, the ends of the brace may butt against each other and lie alongside the other central portion 86 of the brace.

In order to hold these central portions of the brace properly spaced from the side arms 55 and 93, I have provided additional U-shaped brackets 90 which are fastened at 91 to the central portions of the respective side arms and which are held by a clamp 92 in rigid contact with the central portions of the brace member. In order to strengthen the entire construction, these central portions of the brace member are preferably spotwelded to each other and to the brackets 90. The connection between the ends of the side arms and the central brace member may also be made by spotwelding. This lazy tong arm unit with a single continuous brace member as described possesses the necessary strength and rigidity to prevent lateral twisting or wobbling of the pantograph unit and lighting units 22.

From the foregoing description it will be apparent that a novel portable light stand has been provided which may be readily carried from place to place, yet which can be easily adjusted to any desired raised or laterally extending position. Since the same results can be achieved by equivalent forms of construction which will be readily apparent to those skilled in the art, it is not my intention to restrict the present invention to the precise structure shown in the drawings. The invention is to be interpreted as broadly as the spirit of the attached claims shall permit.

Now therefore I claim:

1. An adjustable light stand having a base member, a lighting unit, a vertically adjustable pantograph provided with lazy tong arms and connecting said base and said lighting unit for movement of the latter between extended and collapsed positions with respect to the base, and two substantially parallel spring means for holding said pantograph at any of its vertical positions, one of said spring means being effective when said lazy tong arms are at a substantial angle with respect to said base, the second spring

means being effective only when said arms approach a collapsed position parallel to said base.

2. An adjustable light stand having a base member, a lighting unit, a vertically adjustable pantograph provided with a pair of lazy tong arms and connecting said base and said lighting unit for movement of the latter between extended and collapsed positions with respect to the base, one of said arms being pivotally mounted at one end of said base and the second arm being slidable with respect to said base from the opposite end of the base toward said first end as said lighting unit is raised, spring means connected to said slidably mounted arm and effectively holding the arm and lighting unit in raised position when said arm is at a substantial angle with respect to said base and additional spring means substantially parallel to said first spring means and resisting sliding movement of said arm along the base toward said opposite end only when said arm approaches a collapsed position parallel to said base.

3. An adjustable light stand having a base member, a lighting unit, a vertically adjustable pantograph provided with a pair of lazy tong arms and connecting said base and said lighting unit for movement of the latter between extended and collapsed positions with respect to the base, one of said arms being pivotally mounted at one end of the base, a slide movable on said base from the opposite end toward said first end, the second of said arms being pivotally mounted on said slide for movement of the slide toward said first end as the lighting unit is raised, spring means connected to said base and to said second arm for resisting movement of said arm and slide toward said opposite end when said arm is at a substantial angle with respect to the base, and additional spring means engaging said slide and said base for resisting the movement of the slide toward said opposite end only when said arm approaches a collapsed position parallel to said base.

4. An adjustable light stand having a base member, a lighting unit, a vertically adjustable pantograph provided with a pair of lazy tong arms and connecting said base and said lighting unit for movement of the latter between extended and collapsed positions with respect to the base, one of said arms being pivotally mounted at one end of the base, a slide movable on said base from the opposite end toward said first end, the second of said arms being pivotally mounted on said slide for movement of the slide toward said first end as the lighting unit is raised, spring means connected to said base and to said second arm for resisting movement of said arm and slide toward said opposite end when said arm is at a substantial angle with respect to the base, additional spring means carried by said slide, and a lug on said base engaged by said slide spring for compression of the latter to resist the final movement of the slide toward said opposite end only when said arm approaches a collapsed position parallel to said base.

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