Aug. 29, 1939. J. GELB 2,171,028

STAND FOR SUPPORTING LIGHT PROJECTING OR LIGHT RECEIVING UNITS

Filed Oct. 15, 1935 3 Sheets-Sheet 1

Fig. 1

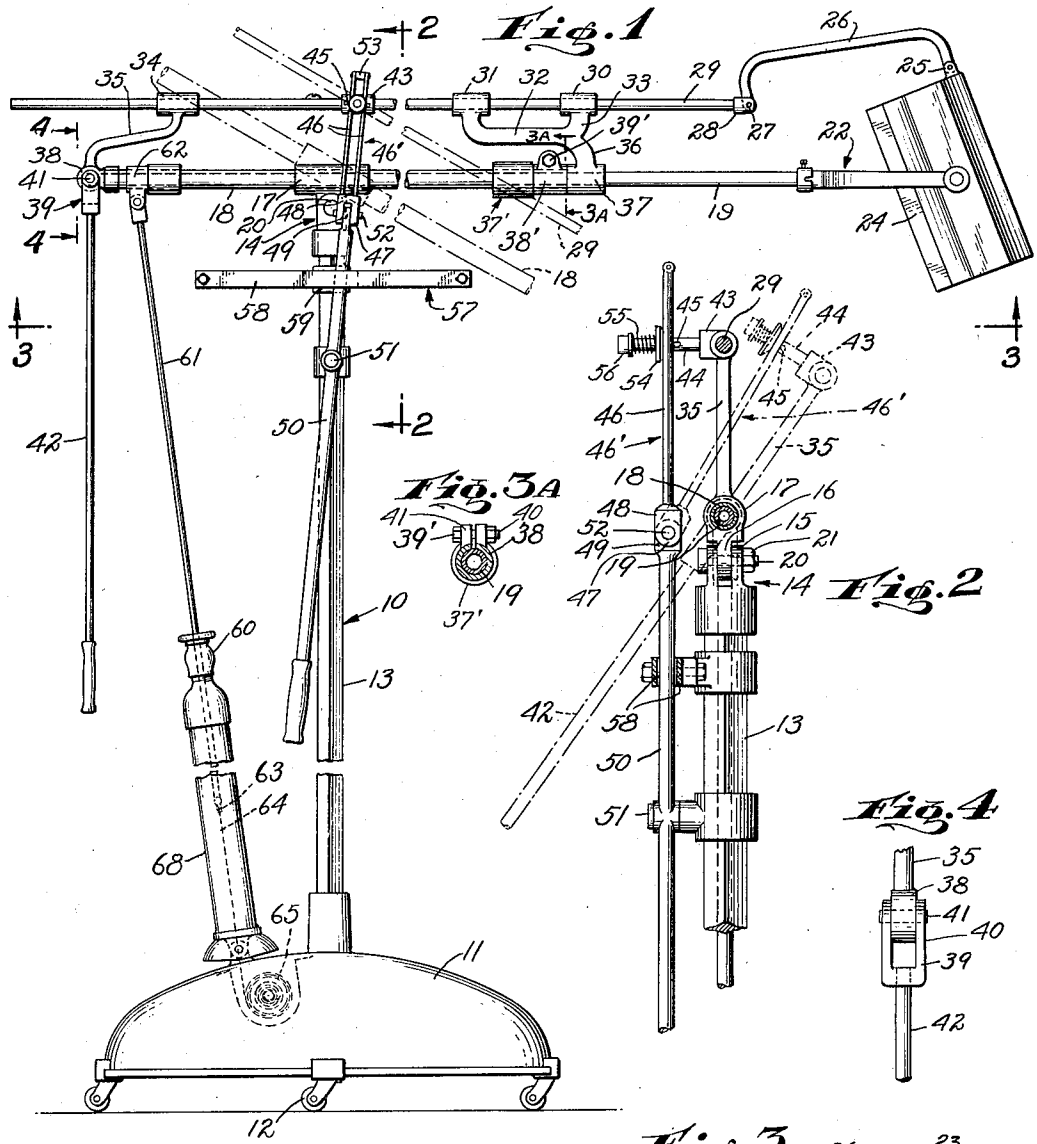
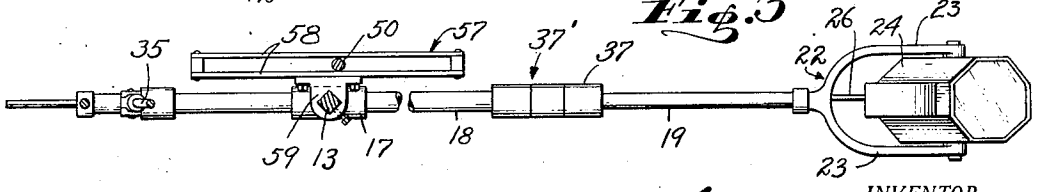


Fig. 3A

Fig. 2

Fig. 4

Fig. 3



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Filed Oct. 15, 1935 3 Sheets-Sheet 2

Fig. 6

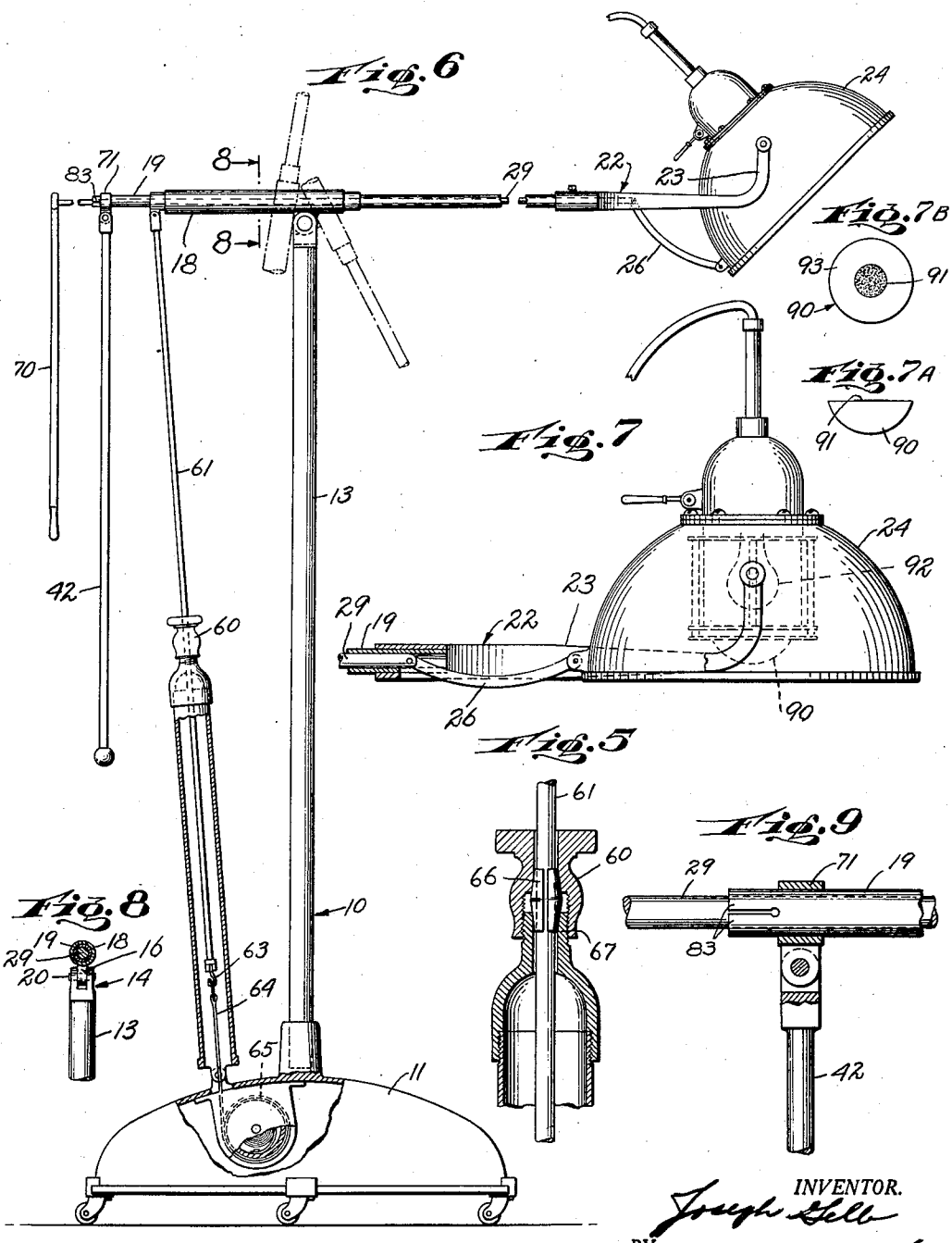


Fig. 7B

Fig. 7A

Fig. 7

Fig. 5

Fig. 9

Fig. 8

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Filed Oct. 15, 1935 3 Sheets-Sheet 3

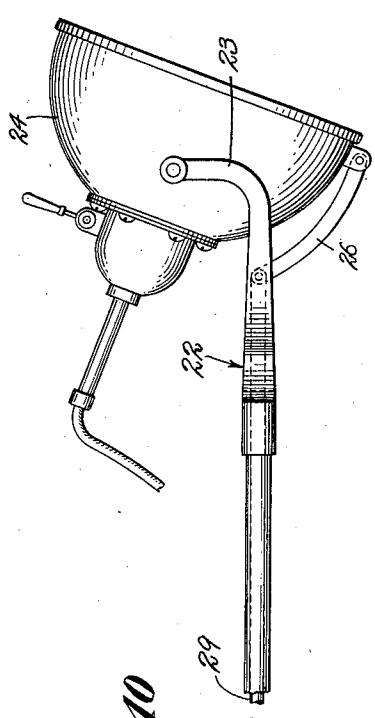


Fig. 10

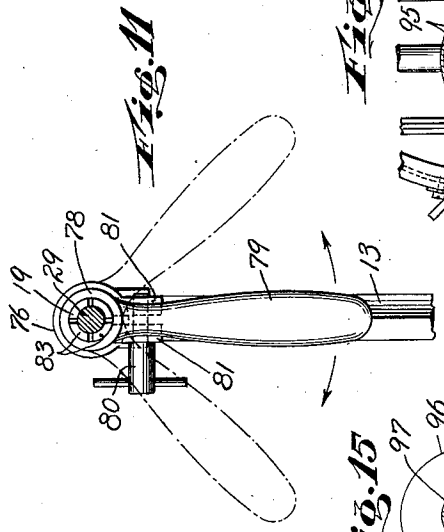


Fig. 11

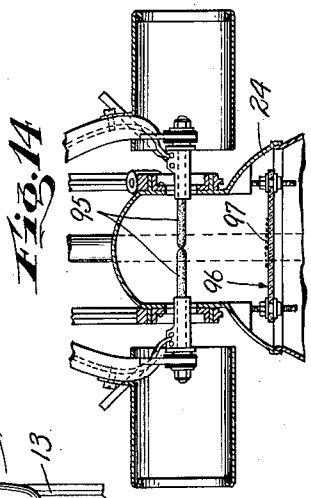


Fig. 14

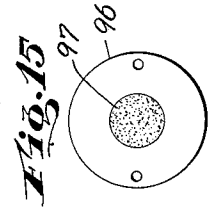


Fig. 15

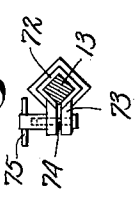


Fig. 13

Fig. 12

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UNITED STATES PATENT OFFICE

2,171,028

STAND FOR SUPPORTING LIGHT PROJECTING OR LIGHT RECEIVING UNITS

Joseph Gelb, New York, N. Y.

Application October 15, 1935, Serial No. 45,019

8 Claims. (Cl. 248—123)

The subject matter of this invention has to do with portable supports for adjustably and pivotally sustaining an appropriate housing having a light projecting or receiving unit. More particularly, however, the invention is particularly concerned with portable stands of the type comprising a vertical pedestal or column pivotally carrying an elongated arm for adjustably sustaining the load of the particular unit mounted at one end thereof.

The primary object of the invention is to provide a portable stand having means for rotatably sustaining an elongated support pivotally suspending a light receiving or projecting unit and slidable means rectilinearly movable relative to the rotatable sustaining means for tiltably adjusting the suspended unit.

The invention has as another object the provision of a portable stand characterized by tubular means for rotatably sustaining a hollow rod in which an elongated member is slidably and rectilinearly guided, the elongated member having a link pivoted thereto for tiltably displacing the particular unit pivotally associated with the hollow rod.

The invention has as a further object the provision of a stand comprising a pivoted connection with an arm rotatably carrying means for supporting a light projecting or receiving unit together with rectilinearly slidable means for tiltably adjusting the unit relative to its supporting arm and spring counterbalancing means for disconnectably holding the arm in a set tiltable position and for sustaining the load imparted by said light projecting or receiving unit in equilibrium.

The invention further comprehends as an object thereof the provision of functionally and structurally improved portable stand having a tiltably supported elongated arm pivotally carrying a casing at one end and having its other end appropriately connected to a spring counterbalancing unit for holding the arm in a desired tilted position and in equilibrium.

The invention further contemplates as an object thereof the provision of a relatively rugged and durable support having a pivoted arm carrying a rotatable and settable rod comprising a yoke for pivotally suspending a casing having a light projecting or receiving unit, and an elongated slidable member spaced from the rotatable rod pivotally associated with a link pivotally connected to the unit whereby upon rectilinear displacement of the elongated member the link is angularly displaced to tilt the unit relative to the yoke.

The invention has as a further object the provision of a stand adapted to support a light receiving or projecting unit comprising means for pivotally suspending the unit, settable means for bodily and rotatably adjusting the suspending means for bodily rotating the unit, means for tilting the unit relative to its suspending means, and spring means for counterbalancing the load of said unit in a tilted or nontilted position of the suspending means.

Other objects will appear from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a side elevational view of my stand according to the invention.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

Fig. 3A is a sectional view on the line 3A—3A of Fig. 1.

Fig. 4 is a view taken along the line 4—4 of Fig. 1.

Fig. 5 is an enlarged sectional view of the clamping means for removably holding an associated connecting rod of a spring counterbalancing device in a set position of adjustment.

Fig. 6 is a side elevational view, partly in section of another form of stand, illustrating a housing carried thereby in a tilted position.

Fig. 7 is a fragmentary view of a portion of the stand illustrated in Fig. 6, showing the housing moved to a horizontal position.

Fig. 7A is a sectional view of a slightly modified form of lens.

Fig. 7B is a plan view of Fig. 7A.

Fig. 8 is a sectional view on the line 8—8 of Fig. 6.

Fig. 9 is an enlarged view of the inner rotatable tube or arm which carries the casing supporting yoke.

Fig. 10 illustrates a side elevational view of a slightly modified stand according to the invention.

Fig. 11 is an enlarged sectional view on the line 11—11 of Fig. 10, illustrating in dash and dot lines several settable positions of the yoke carrying rotatable tube.

Fig. 12 is a sectional view on the line 12—12 of Fig. 10 and

Fig. 13 is a sectional view on the line 13—13 of Fig. 10.

Fig. 14 is a sectional and elevational view of an arc lamp according to the invention partic-

ularly illustrating a hot spot eliminator disposed adjacent the light source and

Fig. 15 is a plan view of the hot spot eliminator shown in Fig. 14.

The portable stand, generally designated 10, comprises a relatively heavy base 11 appropriately supported on wheels 12. Vertically secured to base 11 is a post or column 13 to which is rigidly secured a yoke 14 having upstanding spaced and perforated lugs 15 hingedly receiving a perforated ear 16 depending from a hollow cylindrical coupling 17 fixedly secured to an elongated hollow outside cylindrical tube or shell 18 rotatably supporting an elongated hollow rod or arm 19.

Coupling 17 is swingable relative to post 13 by reason of bolt 20, the shank of which serves as fulcrum means to permit coupling 17 to hinge or pivot in respect to yoke 14. The adjustable clamping member 21 prevents transverse displacement of bolt 20 relative to yoke 14.

Fixedly secured to the forward end of the hollow settable and rotatable arm 19 is a U shaped fork or suspending means 22 having spaced arm 23 adapted to pivotally support or suspend a housing 24 which may contain an illuminating or camera unit. Secured to one end of housing 24 is a pair of spaced lugs 25 pivotally connected to a forward part of a link 26 having its other end pivotally secured between a pair of lugs 27 of a coupling 28 fixed to the forward end of cylindrical slidable rod 29 adapted to be reciprocably guided by the spaced hollow sleeves 30 and 31 associated with the spaced arms 32 and 33 of bracket 36 and by a sleeve 34 of the rear bracket 35.

Bracket 36 is provided with a guide sleeve 37 fixedly secured to rod 19. A bushing or gland 37' is appropriately non rotatably clamped to the elongated hollow rod or arm 18 secured to coupling 17 and serves as a stop or end bearing for the rotatable guide sleeve 37.

Bracket 35 includes an enlargement 38 pivotally straddled by a yoke 39 having its arms 40 pivotally retained on bolt 41 carried by enlargement 38. Yoke 39 has attached thereto a handle 42 which if manipulated transversely relative to the horizontal axis of arm 18 causes inner rod 19 to rotate relative to the outside arm 18. Hence bracket 35 and arms 32 and 33 of bracket 36 will be correspondingly rotatably and angularly displaced, consequently causing rod 29 to tilt or swing about arm 18. Accordingly housing 24 is bodily and correspondingly tilted in a plane transverse to the horizontal axial plane of tube 18. By reason of the close frictional gripping reaction of the reduced split collar 38' of gland 37', rod 19 after having been rotatably set in a desired position is retained in such position. The desired frictional engagement between the split collar 38' and rod 19 may be controlled by adjusting clamping head 39' carried by bolt 40 received in ears 41' (see Fig. 3A).

Housing or casing 24 may be also tiltably adjusted in respect to supporting fork 22. To this end, a coupling 43 is fixedly attached to reciprocable rod 29. Secured to coupling 43 is a bolt 44 sustaining a stop pin 45 which serves as an abutment for the spaced sides 46 of a frame 46' having its lower ends connected to a yoke or bifurcation 47 having its spaced legs 48 straddling a lug 49 of a manipulating handle or lever 50 pivotally mounted on bolt 51 rigidly sustained by the vertical column or pedestal 13.

The legs 48 of yoke 47 are hingedly connected to the perforated lug 49 of lever 50 by a suitable fulcrum pin 52 and the upper portion of the spaced arms of frame 46' are suitably interconnected by a brace block 53.

Loosely surrounding the shank of bolt 44 in an annulus or ring 54 which yieldingly bears against the spaced sides 46 of the frame due to the action of a helicoidal spring 55 surrounding the shank of bolt 44 and interposed between ring 54 and head 56 of the bolt.

The upper part of the lever 50 is movably guided in a track generally denoted 57 comprising spaced longitudinally disposed bars 58 appropriately carried by a coupling 59 secured to a pedestal or column 13.

By moving lever 50, the latter pivots about the fulcrum bolt 51, but motion longitudinally relative to rod 19 is transmitted to the yoke or knuckle 47 and the spaced sides 46 of the frame and since these sides 46 straddle bolt 44 longitudinal motion is imparted to coupling 43 and consequently rod 29 is rectilinearly displaced relative to its supporting collars or sleeves 30, 31 and 34. Hence, hook or link 26 is actuated and the latter changes the angular relation of housing 24 in respect to its supporting yoke 22.

If, however, handle 42 is rotatably manipulated, spaced arms 46 of the frame are tilted in respect to its associated lever 50 (see dash and dot lines Fig. 2) that is to say, yoke 48 swings relative to its pivotally associated lug 49 of lever 50 and the action of spring 55 urges ring 54 against the sides of frame 46 regardless of the transverse angular position of the latter in respect to lever 50. Therefore after handle 42 has been disposed in a desired position and frame 46' correspondingly tilted sidewise, such tilted position of the frame is retained by spring 55, thus preventing reverse rotation of rod or arm 19. Since rod 42 may be manipulated, clockwise or counter clockwise, the frame 46' may be selectively and transversely tilted to either side of the column 13 and correspondingly bodily rotate housing 24 about the horizontal axis of arm 19. In Fig. 2, the dash and dot lines indicate, for purposes of example, one angular transversely displaced position of frame 46' after handle 42 has been rotated in a direction towards the reader or counter clockwise.

Handle 42 may be also utilized to bodily tilt outside tube or arm 18 relative to pedestal 13 provided of course the rotatable retaining and control bushing 60 is manually elevated relative to connecting rod 61 which has one end swingably connected to a coupling 62 fastened to arm 18 and its other end connected by a hook 63 to a terminal 64 of a rotatable spring counter balancing unit or device 65 appropriately concealed within base 11.

More particularly, control bushing 60 cooperates with a barrel shaped split spring or expandable metal washer 66 surrounding connecting rod 61 and supported on the cylindrical throat or seat 67 of a cylindrical casing mounted on base 11. If the clamping head or bushing 60 is rotated in one direction, washer 66 frictionally bears against rod 61 preventing vertical displacement thereof. If bushing 60 be rotated in a counter direction, the frictional pressure imparted by washer 66 on rod 61 is removed and the latter may be vertically shifted and the spring counterbalancing device may be unwound or automatically coiled up depending upon the direction of the force applied either to handle 42 or the connecting rod 61. In either case, however, a downward or upward pull be applied to either

handle 42 or rod 61 causes tube or arm 18 to be tilted relative to the main column 13 and a desired tilted position may be retained by manipulating head 60 to permit washer 66 to frictionally engage rod 61.

Specifically, however, where an upward thrust is applied to either lever 42 or rod 61, provided the latter is released, rod 18 carries housing 24 downwardly. During this operation, however, the spring counterbalancing device unwinds or becomes extended but coacts to hold the rod or arm 18 at all times in equilibrium. After the desired adjustment has been made, head 60 is rotated to set connecting rod 61 against vertical displacement as is well understood.

With the control bushing 60 released, and a downward thrust applied to either lever 42 or rod 61, arm 18 carries housing 24 upwardly and the spring counterbalancing device rotatably coils up or contracts although continuously balancing the load on the arm 18.

By the present construction, it will be appreciated that the housing 24 may be quickly adjusted to a desired position by merely tilting the outside tubular arm 18 relative to the column, and a supplemental adjustment may be made by rotating the handle 42, which serves to rotatably set the housing about the horizontal axis of arm 18. Housing 24 may also be adjusted relative to yoke 22 or arm 18 by merely actuating lever 50 causing rod 29 to be rectilinearly displaced thereby effecting a change in the angular relation of the housing.

In the form according to Fig. 6, tubular arm 18 is provided with depending lug 16 pivotally supported on fulcrum pin 20 sustained by the yoke 14 of the vertical column or post 13. Within arm 18 is rotatably mounted the hollow rod or arm 19 in which is reciprocably guided the elongated solid arm or rod 29. Tubular arm 18 is provided with a reduced rear portion to which is pivotally connected the upper part of the connecting rod 61 operatively associated with the spring counterbalancing unit 65 rotatably supported within base 11.

When head 60 is released, the connecting rod 61 may be raised or lowered to permit tilting of arm 18 relative to column 13 and upon tightening of the head 60 against the barrel shaped washer 66 of course, arm 18 is retained in the desired tilted or set position.

Rigidly secured to the rotatable tubular arm 19 is the fork 22 whose spaced arms 23 pivotally sustain casing 24 which has one end pivotally secured to the arcuate link 26 having its rearward end pivotally connected to the elongated rod 29 slidably guided by the rotatable tubular arm 19. When arm 29 is shifted forwardly or rearwardly, link 26 is angularly displaced, consequently changing the annular position of housing 24 relative to the horizontal axis of tube 18 or its supporting yoke 22. Such tilting may be effected by applying a forwardly or rearwardly directed force on depending arm 70 secured to the rectilinearly slidable rod 29.

Housing 24 may also be bodily rotated to an adjusted position about the horizontal axis of rod 18. In this connection, lever 42 is utilized. This lever is swingably associated with a collar 71 rigidly secured to the rotatable tube 19. Hence if the lever 42 is rotatably displaced, tube 19 will be correspondingly displaced, consequently bodily rotating fork 22 which bodily turns casing 24.

According to the form illustrated in Figs. 10–13 inclusive non circular column 13 is slidably and vertically guided in a hollow post 13' attached to the portable base 11. As illustrated hollow post 13' is provided with a reduced and split portion 72 having spaced laterally extending ears 73 adjustably and rotatably sustaining bolt 74 which if rotated upon actuating of pin 75 carried thereby, spreads or moves ears 73 towards each other to frictionally disengage collar 72 from column 13. If diverged or spread, column 13 may be slidably moved relative to the companion post 13'. If ears 73 are brought towards each other, column 13 is frictionally engaged by the split collar 73 thereby preventing vertical movement of column 13 relative to post 13'.

Rigidly attached to column 13 is a tube or sleeve 76 which rotatably supports the hollow arm or rod 19 in which solid rod 29 is rectilinearly guided. Yoke 22 is fixedly carried by the forward end of rod 19 and arms 23 of yoke 22 pivotally carry housing 24 to which link 26 is pivotally connected. This link is also pivotally secured to slidable rod 29 which includes a manipulatable head or button 77.

If therefore head 77 is grasped and moved either forwardly or rearwardly, the angular position of link 26 is changed and accordingly housing 24 is tilted relative to the hollow tube 19 having collar 78 fixedly secured thereto and depending from the latter is an arcuately shaped handle 79 which if grasped and rotated bodily rotates rod 19 about its longitudinal axis. Accordingly, yoke 22 is bodily rotated, thus bodily rotating housing 24.

Having rotated tube 19 to a desired position of adjustment, such position may be retained by actuating bolt 80 threadably carried by the spaced ears 81 depending from the split reduced portion 82 extending from sleeve 76, that is, if bolt 80 is rotated ears 81 may be brought together to permit reduced portion 82 to firmly and frictionally grip tube 19, thus preventing rotation of the latter.

With the form according to Figs. 6 and 10, it will be observed that tube 19 at its rear portion is split to define several segments 83 which frictionally cooperate and grip the exterior surface of rod 29 to hold the latter in a set position of adjustment.

In Fig. 7A, the condensing lens 90 illustrated within the housing or casing 24 of Fig. 7, is shown in elevation. It will be noted that central portion 91, that part of the lens closest to the light source 92, is frosted to diffuse the intense heat rays from the light source while the remaining upper surface 93 of the lens may be left unfrosted or provided with a coating having less diffusing force than the portion 91 to transmit the less intensified heat rays.

According to the form disclosed in Fig. 14, the heat and light rays emanating from the electrical carbon members or electrodes 95 is directed onto a transparent plate 96 to dissipate the heat and light rays and remaining part of the upper surface of plate 96 may be left uncoated or provided with a coating having a lower diffusing action than the central part 97.

In the broader aspects of the invention, I do not desire to be understood as limiting its embodiments to details herein described and shown illustratively as a wide variety of modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. In a stand, a base, a column carried by said

base, a sleeve connected to the column, an arm rotatably guided by the sleeve, a pivoted connection between said column and sleeve for tilting the arm relatively to the column, a holding member secured to one end of said arm, a housing, means for pivotally holding said housing to the holding member, an elongated slidable rod, a link interposed between said housing and rod, means for pivotally connecting one end of the link to the housing, means for pivotally connecting another end of said link to the rod, and manipulable means connected to said rod for displacing the latter in respect to said arm for changing the angular relation of the link in respect to said rod for tilting said housing relatively to said holding member.

2. In a stand, a base having an upstanding column, a tiltable bearing member pivotally connected to said column, an arm rotatably guided by said bearing member and carrying at one end thereof means for pivotally sustaining a housing, an actuating member guided by and slidable relative to said bearing member, link means pivotally connected to said actuating member and housing, a handle connected to said arm for rotating the latter about its longitudinal axis and bodily rotating said housing, a lever connected to said actuating member for shifting the latter to actuate said link means and tilt said housing relative to said arm, spring counterbalancing means within said base, and means interconnecting said arm and said counterbalancing means.

3. In a stand, a base having an upstanding column, a tiltable bearing member pivotally connected to said column, a housing, an arm rotatably guided by said tiltable bearing member and carrying at one end thereof means for pivotally sustaining the housing, an actuating member guided by and slidable relative to said bearing member, link means pivotally connected to said actuating member and housing, a handle connected to said arm for rotating the latter about its longitudinal axis and bodily rotating said housing, displaceable means connected to said actuating member for shifting the latter to actuate said link means and tilt said housing relative to said arm, spring counterbalancing means concealed by and within said base, a liftable member interconnecting said bearing member and balancing means, and clamping means associated with said liftable connection for retaining said bearing member in a set position.

4. In a stand, a housing, an elongated arm, means for rotatably supporting the elongated arm being adapted to sustain the housing, an elongated rod, bearing means carried by said rotatable arm for slidably guiding said rod, link means pivotally connected to said rod and housing, means connected to said arm for rotating the latter and for arcuately and bodily displacing said rod, link means and housing relative to the longitudinal axis of said supporting means, and a manually operable device for shifting said slidable rod to actuate said link means and change the angular relation of said housing in respect to said arm, said manually operable device being adapted to prevent reverse arcuate displacement of said rod, link means and casing pursuant to a set position of said rotatable arm.

5. In a stand, a base, a column carried by said base, a sleeve connected to said column, an arm rotatably guided by said sleeve, a pivoted connection between said column and sleeve for tilting said arm relative to said column, a yoke secured to one end of said arm and comprising spaced extensions, a housing straddled by said extensions, means for pivotally holding said housing to said extensions, an elongated slidable rod, a link interposed between said housing and rod, means for pivotally connecting one end of said link to said housing, and means for pivotally connecting another end of said link to said rod, and manipulatable means connected to said rod for displacing the latter in respect to said arm for changing the angular relation of said link in respect to said rod for tilting said housing relative to said yoke.

6. In a stand, a base, a column secured to said base, a tiltable tubular member, a pivoted connection between said tubular member and column, an arm in part within and rotatably guided by said member and having ends overhanging said column, a yoke secured to one end of said arm, a housing pivoted to said yoke, a slidable rod, a link interposed between said rod and housing, means pivoting said rod to said link, means pivotally connecting said link and housing, and spring counterbalancing means in part concealed within said base and adapted to be extended therefrom and operatively connected to said arm to counterbalance the load of and on the latter.

7. In a stand, a base having an upstanding column, a bearing member pivotally connected to said column, an arm rotatably guided by said bearing member, a housing, a yoke secured to said arm and having extensions straddling said housing and pivotally connected thereto, a sleeve member, means carried by said rotatable arm to sustain said sleeve member, a rod slidably guided by said sleeve member, a link having one end pivoted to said housing and another end pivoted to said rod, a lever connected to said column and to the rod to slide said rod in said sleeve for changing the angular relation of said housing in respect to said arm, and a handle connected to said arm for rotating the latter to change the angular relation of said sleeve member relative to said lever for swinging said rod to rotate said housing without changing the angular relation of said housing in respect to said rotatable arm.

8. In a stand, a base having an upstanding column, a tiltable bearing member pivotally connected to said column, a housing, an arm rotatably guided by said bearing member and carrying at one end thereof means for pivotally sustaining the housing, a sleeve device supported from said bearing member, an actuating member guided by and slidable relative to said sleeve device, link means pivotally connected to said actuating member and housing, a handle connected to said arm for rotating the latter about its longitudinal axis and bodily rotating said housing, a lever connected to said actuating member for shifting the latter to actuate said link means and tilt said housing relative to said arm, and counterbalancing means for said arm.

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