Sept. 24, 1957 D. A. LEWIS, JR 2,807,089

SKY LOOKOUT CHAIR

Filed Aug. 31, 1954 3 Sheets-Sheet 1

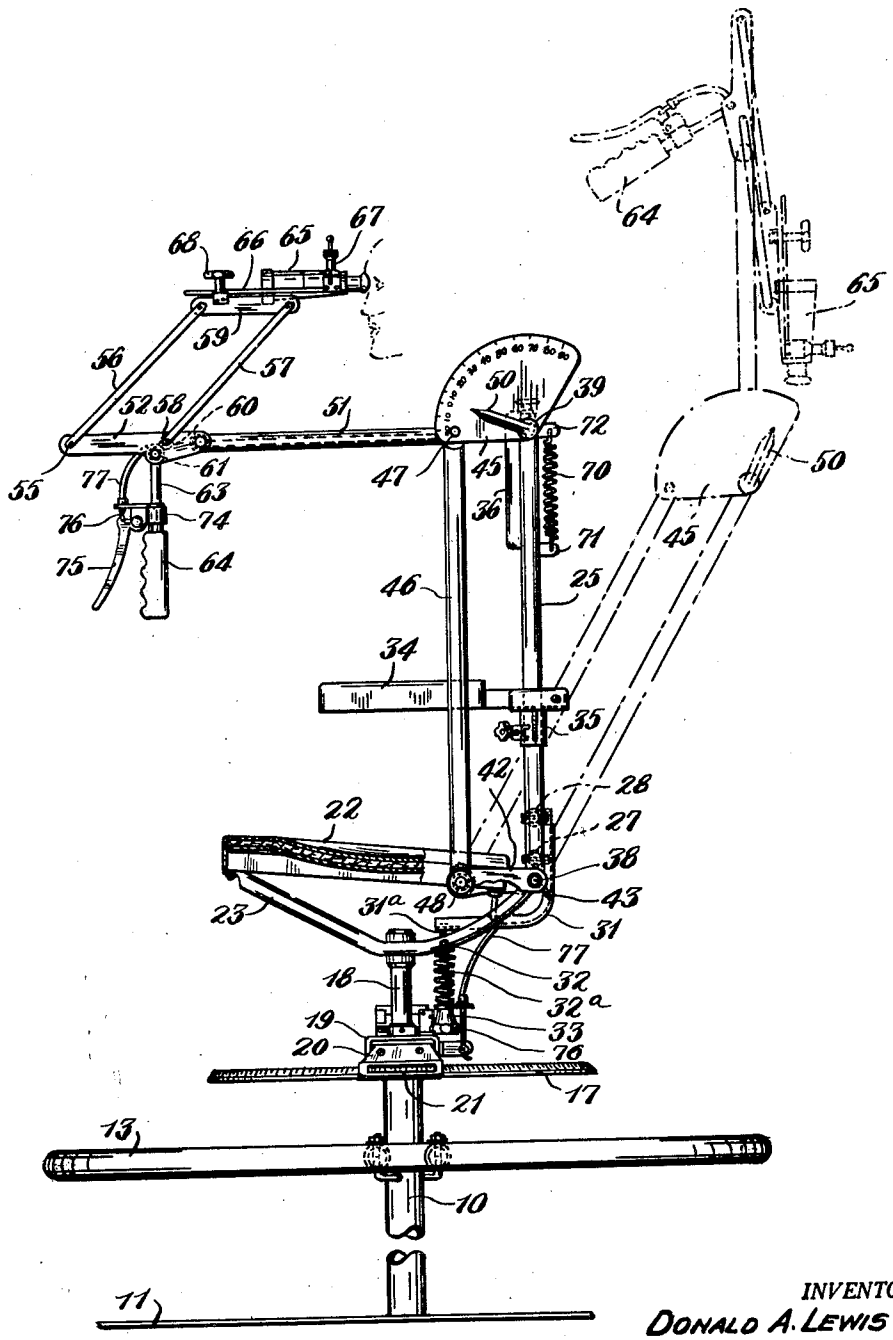

FIG. 1

INVENTOR.
DONALD A. LEWIS JR.
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

Sept. 24, 1957 D. A. LEWIS, JR 2,807,089

SKY LOOKOUT CHAIR

Filed Aug. 31, 1954 3 Sheets-Sheet 2

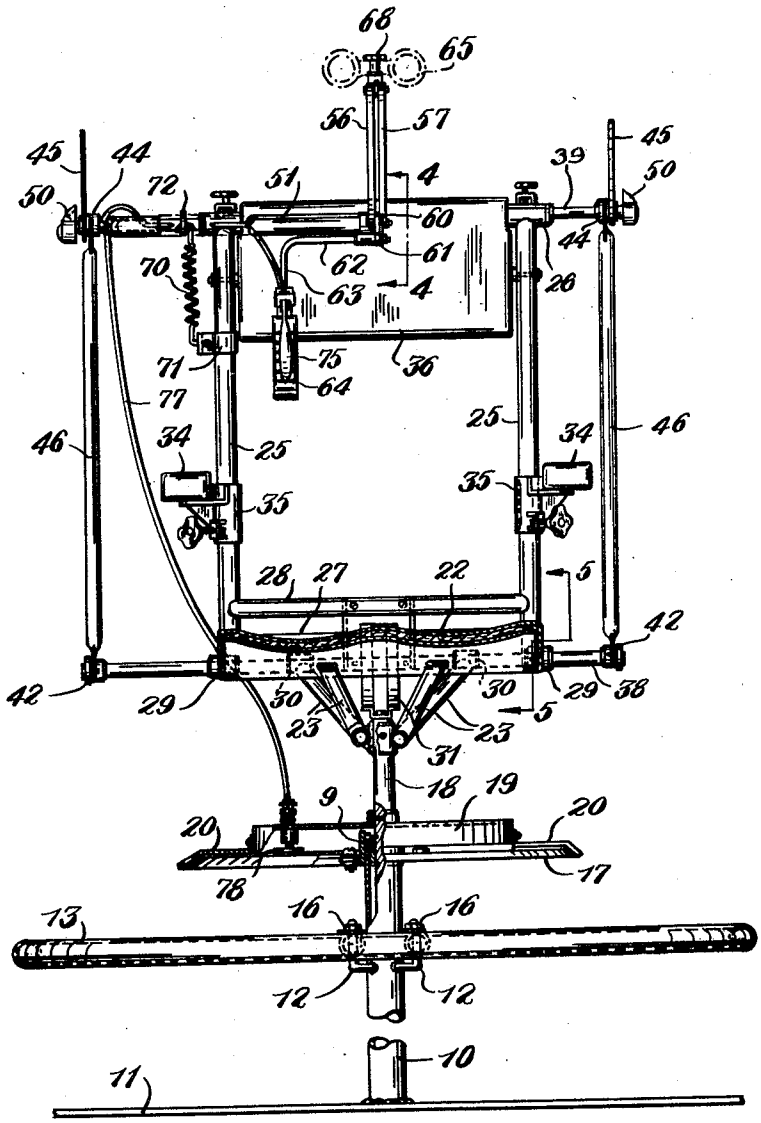

FIG. 2

INVENTOR.
DONALD A. LEWIS JR.
BY Hudson, Daughtry, Williams, David & Hoffmann
ATTORNEYS

Sept. 24, 1957 D. A. LEWIS, JR 2,807,089

SKY LOOKOUT CHAIR

Filed Aug. 31, 1954 3 Sheets-Sheet 3

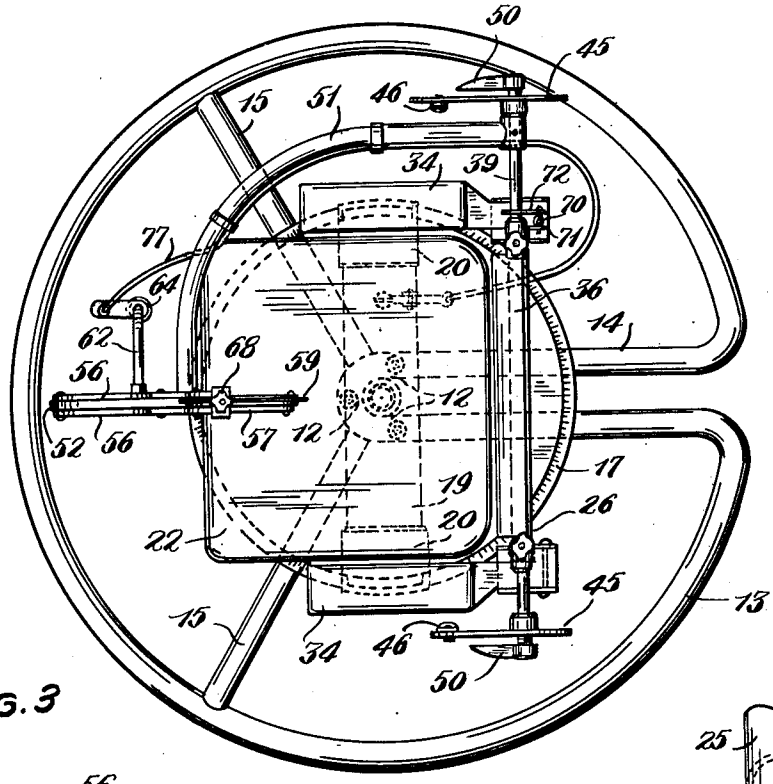

FIG. 3

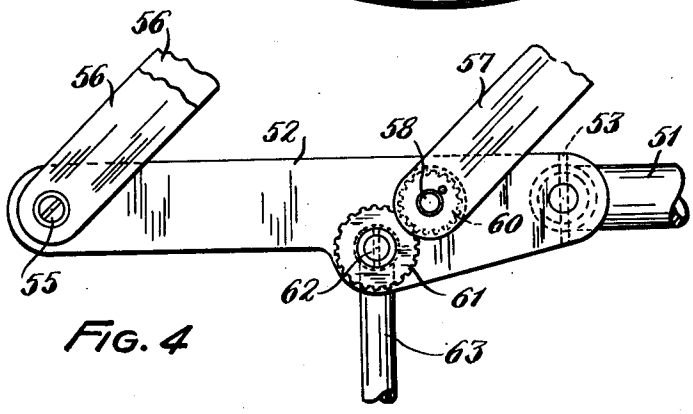

FIG. 4

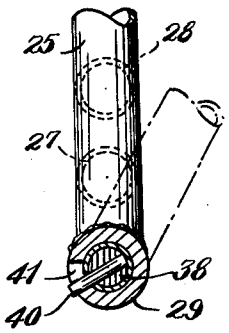

FIG. 5

INVENTOR.
DONALD A. LEWIS JR.
BY Hudson, Boughton,
Williams, David & Hoffmann
ATTORNEYS

United States Patent Office 2,807,089 Patented Sept. 24, 1957

2,807,089

SKY LOOKOUT CHAIR

Donald A. Lewis, Jr., Parma, Ohio

Application August 31, 1954, Serial No. 453,368

4 Claims. (Cl. 33—69)

This invention relates to improvements in sky lookout chairs, and has reference particularly to the mounting of binoculars in such manner as to promote comfort, convenience and efficiency of the operator in making altitude observations. The invention constitutes an improvement over my copending application Serial No. 374,960, filed August 18, 1953.

In the invention of the latter application the chair back is hinged at its lower end to the chair seat. At the upper end of the back there is a transverse shaft upon which is oscillatably mounted a sector shaped yoke with dial graduations, this yoke being pivotally connected with the chair by a link parallel to the chair back and of the same length as the spacing between the chair hinge and the said shaft. The arm which carries the binoculars is fixed to the said shaft and carries a pointer which moves over the face of the dial as the arm swings upwardly or downwardly with the shaft as its axis. When a chair of such construction is swung back and the binocular supporting arm raised for readings near the zenith, the position of the operator becomes less comfortable. The present invention corrects and overcomes this difficulty.

One of the objects of the invention therefore is the provision of means under the control of the operator for moving the binocular carrier downwardly toward the supporting arm and rearwardly for the convenience and comfort of the operator when making altitude observations near the zenith.

Another object is the provision of a mounting for the binocular carrier which comprises parallel links of equal length pivotally connected with the supporting arm, whereby the binoculars are maintained in a constant angular relation to the arm during different positions of adjustment.

Still another object is the provision of depending handle means pivotally mounted on the arm for swinging the parallel links toward and away from the arm, said means comprising operating connections which enable movement of the handle rearwardly to produce rearward movement of the links.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of a sky lookout chair embodying the invention;

Fig. 2 is a front elevation of the same, certain of the parts being broken away and certain others being shown in section to better illustrate the invention;

Fig. 3 is a plan view of the same, the binoculars being omitted, and

Figs. 4 and 5 are detail elevational views on a larger scale taken substantially on the lines 4—4 and 5—5 of Fig. 2.

The binocular mounting of this invention, in at least some of its aspects, may be applied to sky lookout chairs of various designs. The chair illustrated herein comprises a tubular metal standard **10** which may be welded to a metal element **11** of a ship's deck. Upon this standard there is mounted by means of metal brackets **12** a ring **13** constituting a rest for the feet of the operator and affording a kick ring against which the operator may push to propel the chair around to any desired position for making azimuth observations. This ring is preferably built as illustrated in Fig. 3, that is it comprises a reentrant loop **14** and two radial braces **15**, enabling the ring to be assembled upon or removed from the standard, the loop portion having holes therethrough to take the upwardly projecting arms of the brackets which are threaded to receive nuts **16** for securing the ring in place.

A disk **17** is fixedly mounted on the standard **10**. Its outer edge is beveled and is provided with two oppositely disposed 180° azimuth scales. In the hollow standard there is rotatably mounted a chair post **18**, antifriction bearings being preferably provided to maintain the post in accurate alignment with the fixed standard **10** while permitting free relative rotation. A ball bearing **9** takes endwise thrust.

Mounted upon the post **18** there is an inverted channel **19**, at both ends of which there are arms **20** with ends inclined downwardly at the same angle as the beveled edge of the disk **17**. Each of these inclined ends is provided with a horizontally elongated window and a pointer **21** for cooperation with one of the azimuth dials, see Fig. 1.

A chair seat **22** is mounted on a suitable frame **23**, and the latter is rigidly attached to the upper end of rotatable post **18**, the parts **18** and **23** thus turning together. The chair back is hinged at its lower end to the chair seat. As shown herein the back comprises upstanding side frame bars **25**, which are preferably tubular, a tubular upper rail **26** and two tubular lower rails **27** and **28**. The upstanding side frame bars **25** at their lower ends are welded or otherwise attached to sleeves **29** which are oscillatable on a shaft **38**. Sleeves **30** are secured to the rear ends of the seat frame members **23**, and in these sleeves the shaft **38** is fixed.

Bolted to the seat back there is a flanged channel **31**, the lower end of which is bent forwardly as shown in Fig. 1. A bolt **31a** depends from the forward end of channel **31** and extends slidably through a central transverse hole in a horizontal pivot pin **32** which extends between bearings in the two rear branches of the frame **23** for oscillation about a transverse axis. A coil spring **32a** surrounds bolt **31a** below pin **32** and bears at its lower end against a nut **33** threaded onto the lower end of the bolt. The force of the spring can be varied by adjustment of this nut. The chair back is thus held yieldably in the vertical position illustrated in full lines in Fig. 1.

Arm rests **34** are carried by sleeves **35** which may be adjusted up and down on the side bars **25**, and a back cushion **36** is supported partly upon the side bars **25** and partly upon the tubular upper rail **26**.

The shaft **38** extends through the sleeves **29** at the bottom of the back frame and through the sleeves **30** at the rear of the seat frame. It projects laterally beyond the chair in both directions. This shaft is fixed against rotation in the sleeves **30** that constitute part of the seat frame. In the tubular upper rail **26** there is a similar shaft **39** which also projects laterally to the same extent as the shaft **38**. However, shaft **39** is freely rotatable in the tubular rail **26**. As shown in Fig. 5 means are provided to limit the extent to which the seat back may be swung rearwardly. For this purpose a pin **40** driven into shaft **38** moves in a slot **41** in the sleeve, the length of which slot is such as to permit a swing of the chair back through an angle of 30°. At each outer end of shaft **38** there is secured a yoke **42**, as by means of a setscrew **43**. Near the ends of shaft **39** there are sleeves **44** loosely

mounted on the shaft and carrying yokes 45. A link 46 is pivotally connected at 47 with yoke 45 and at 48 with yoke 42. The distance between shaft 39 and pivot 47 is the same as that between shaft 38 and pivot 48. Likewise the link 46 has the same effective length as the side bars 25 of the back frame. Consequently, at each side of the chair there is a parallelogram consisting of the parts 25, 42, 46 and 45, the yokes 42 remaining fixed and the other parts of the parallelogram being movable, as indicated by the broken lines in Fig. 1. The yokes 45 are sector shaped and are provided with altitude gauge markings with which cooperate pointers 50 fixed on each extremity of shaft 39.

Pinned to the shaft 39 at one side of the chair there is a curved arm 51 which extends around in front of the chair and is disposed in a substantially horizontal plane when the parts are in the normal position of Fig. 1. A forwardly extending plate 52 is secured to arm 51 by a pin 53, Fig. 4, or other suitable means, the center line of this plate being disposed in the plane through the arm 51 and the shaft 39. At the forward end of plate 52 there is pivoted at 55 a two-part link 56, the parts of which straddle the plate 52. A single part link 57 of the same length as link 56 is pivoted at 58 to the plate 52. At their upper ends the links 56 and 57 are pivoted to a plate or bar which I term a carrier 59. The spacing of the upper ends of the links on carrier 59 is the same as the distance between pivots 55 and 58. Hence the parts 52, 59, 56 and 57 constitute a parallelogram, the part 52 of which is fixed with respect to arm 51 while the other parts are movable with respect to that arm.

On the pivot 58 there is fixed a gear 60 which meshes with a somewhat larger gear 61 that is pinned to a shaft 62 which is rotatably mounted in plate 52. Shaft 62 extends outwardly a short distance from plate 52 and is then turned downwardly as indicated at 63 and provided with a handle 64 disposed in front of the operator where it may be conveniently grasped by his right hand.

The binoculars 65 are removably secured to the carrier 59, preferably by means of a mounting slide 66 to which the binoculars are clamped at 67, the slide 66 being movable forwardly and backwardly and held in adjusted position by clamping screw 68.

It will be obvious that when the operator swings the handle 64 toward himself and toward the plane of arm 51, the gears 61 and 60 will be rotated and will transmit motion through link 57 to cause the movable parts of parallelogram 52, 59, 56, 57 to move rearwardly toward the plane of arm 51. By this means the height of the binoculars may be adjusted to accommodate them to the stature of operators of different height.

To take a low altitude reading the operator swings the arm 51 upwardly or downwardly by means of handle 64, this being accomplished with ease in view of the fact that the arm and parts associated therewith are counterbalanced by a tension spring 70, the lower end of which is anchored in a bracket 71 clamped to one of the frame side members 25 and the upper end of which is attached to a rearwardly extending bracket 72 on the shaft 39.

The downturned end 63 of shaft 62 may have a clamp 74 mounted thereon, just above handle 64, carrying a pivoted lever 75 which may be used to operate a control. As shown herein this lever operates a flexible wire 76 in a hollow cable 77 which may extend along the arm 51 and downwardly to a brake 78 of any suitable character mounted in the inverted channel 19 for braking engagement with disk 17. The brake may be set to hold the chair in a desired azimuth position and released when the chair is to be turned to a new azimuth position.

When an altitude reading is required of an object in the sky more or less near the zenith, the operator leans back, causing the chair back with associated parts to swing backwardly and downwardly against the action of counterbalancing spring 32a. As he approaches the position shown in broken lines in Fig. 1, binoculars spaced from the plane of arm 51, as in the full line position of that figure, would necessitate a position of his head and neck that would be at least very uncomfortable, but by swinging the handle 64 toward the plane of arm 51 the links 56 and 57 are swung toward that plane, bringing the binoculars rearward to a convenient and comfortable position for use. Different degrees of inclination of links 56 and 57 may of course be employed by the operator to comfortably accommodate the apparatus to his use as the chair is swung to various positions between the full line and broken line positions illustrated.

The use of gears 61, 60, or equivalent means for enabling the operator to swing the handle 64 rearwardly in order to cause the links 56, 57 to swing downwardly and rearwardly, is a distinct advantage of the apparatus.

Having thus described my invention, I claim:

1. In a sky lookout chair, a chair back hinged at its lower end, a horizontal oscillatable transverse shaft at the upper end of said back, said shaft carrying a pointer, a yoke at the upper end of said chair back carrying an altitude scale over which said pointer moves as the shaft turns, means associated with the chair back and dependent upon the movement of the back for maintaining said yoke in a constant angular position relative to said chair seat throughout all positions of the chair back, a binocular supporting arm fixed to said shaft, a binocular carrier, and means for turning said shaft and swinging said arm comprising means operable by one hand of the operator for swinging said arm vertically and moving said carrier toward or away from said arm while maintaining the carrier in a constant angular position relative to the arm.

2. A sky lookout chair as defined in claim 1, wherein the binocular carrier is connected to said arm by a pair of parallel links of equal length, and wherein the means operable by one hand of the operator comprises a handle depending pivotally from the arm to swing backwardly and forwardly, said handle being operatively connected to one of said links, whereby the binocular carrier may be moved toward or away from the arm as the arm is swung vertically.

3. A sky lookout chair as defined in claim 2, comprising means interposed between said operatively connected link and said handle for swinging the links rearwardly toward said arm as the handle moves rearwardly toward the arm.

4. A sky lookout chair as defined in claim 3, wherein said operative connection comprises a pair of intermeshing gears one on said handle and one on said link, whereby the swinging of the handle rearwardly toward the plane through the arm and its horizontal axis will swing the carrier toward the same plane.

References Cited in the file of this patent

UNITED STATES PATENTS

1,716,821	Karnes	June 11, 1929
1,829,614	Schier	Oct. 27, 1931
2,669,784	Lewis	Feb. 23, 1954

FOREIGN PATENTS

129,742	Great Britain	July 24, 1919
550,349	France	Dec. 11, 1922
39,742	France	Feb. 10, 1931

(2d addition to No. 662,734)