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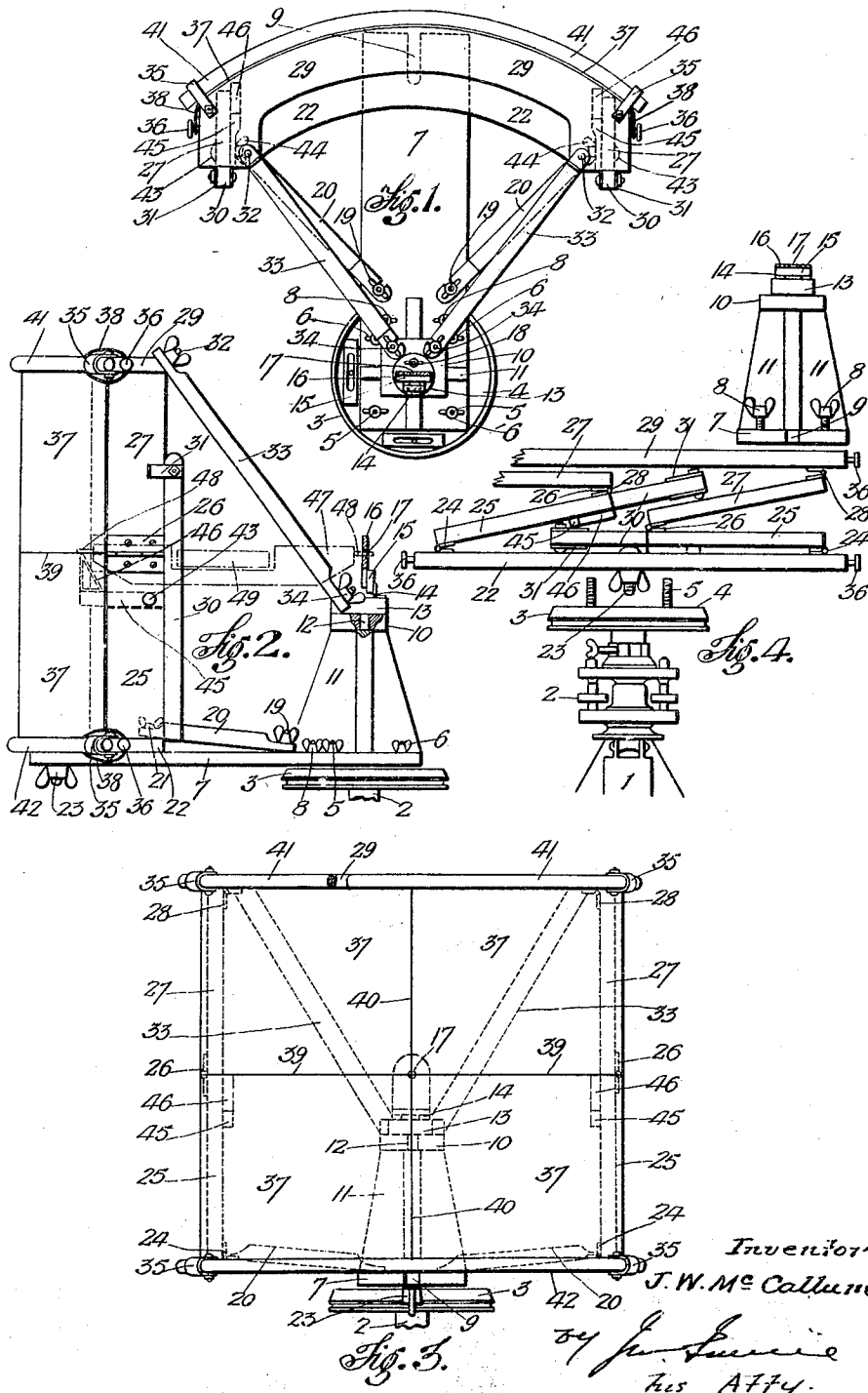
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J. W. McCALLUM

SKETCHING MEANS

Filed April 26, 1921

2 Sheets-Sheet 1



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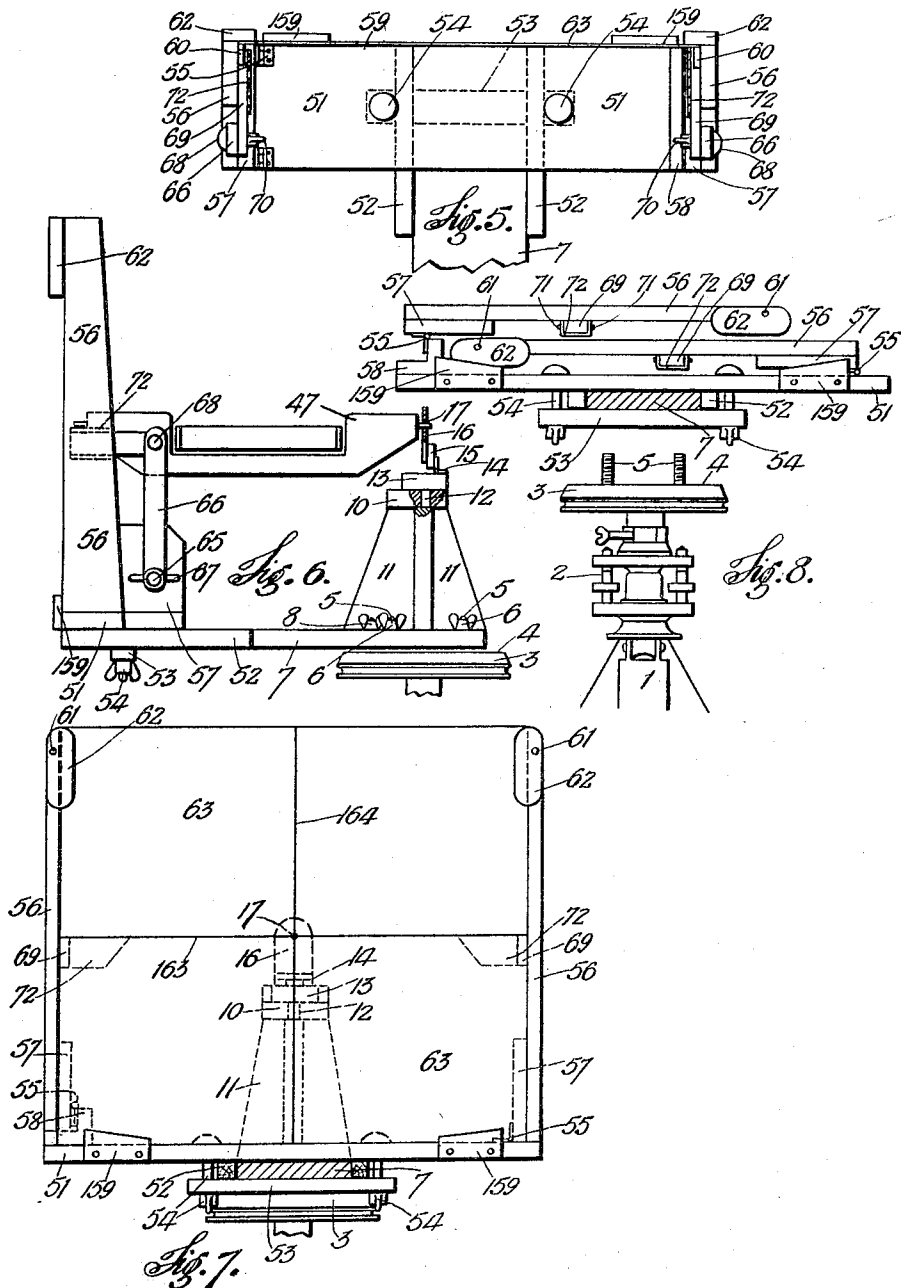
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2 Sheets-Sheet 2



Inventor
J. W. McCallum
By *[Signature]* his Att'y

UNITED STATES PATENT OFFICE.

JOHN WILFRED McCALLUM, OF MAREEBA, QUEENSLAND, AUSTRALIA.

SKETCHING MEANS.

Application filed April 26, 1921. Serial No. 464,763.

To all whom it may concern:

Be it known that I, JOHN WILFRED McCALLUM, a subject of the King of Great Britain and Ireland, residing at the post town of Mareeba, in the Division of North Queensland, State of Queensland, Commonwealth of Australia, have invented certain new and useful Improvements Relating to Sketching Means, of which the following is a specification.

This invention particularly relates to the production of landscape sketches in outline by surveyors and others whereby the bearing of an object, from the point of observation, may be immediately ascertained. It consists essentially in depicting upon a transparent surface the features seen from a definite point through a limited observation opening, and in producing the sketch on to a final sheet by tracing, sun-printing, or other process. The sheet receiving the transfer may be provided with a graduated scale based upon the previously ascertained or known bearing of an object incorporated in the sketch. Two sketches taken from different points of the same area, the relative position of the points being known, permit of the features of the area being mapped in by cross bearings, and both views being under observation at the same time enables a greater number of objects to be located without the usual large amount of clerical labour.

The invention relates with equal pertinence to the perspective sketching of architectural subjects, machinery and the like, and to perspective drawing generally.

Three convenient forms of the invention are described herein. The first is particularly adapted for survey work; the second and third, although satisfactory for survey sketching, are more useful for landscape drawings, perspective views of buildings, machinery and the like.

Referring to the accompanying drawings:—

Figure 1 is a part sectional plan of that embodiment of the invention most suitable for surveying.

Figure 2 is a part sectional side elevation of Figure 1.

Figure 3 is a part sectional front elevation of Figure 1.

Figure 4 is a detail view showing the em-

bodiment seen in Figures 1 to 3 folded for transport.

Figure 5 is a part sectional plan of that embodiment of the invention more suitable for landscape and perspective sketching.

Figure 6 is a part sectional side elevation of Figure 5.

Figure 7 is a part sectional front elevation of Figure 6.

Figure 8 is a detail view showing the embodiment seen in Figures 5 to 7 folded for transport.

The embodiment of the invention used in survey work in the field (Figures 1 to 4) includes a support comprising a tripod 1 having an ordinary theodolite head 2 provided with a turntable comprising a horizontal graduated circle 3 and an upper plate 4 from which upstand studs 5 having wing nuts 6 threaded thereon.

Resting upon the turntable is the inner end of a base plate or supporting table 7 having free holes therein to receive the studs 5. The wing nuts 6 obviously retain the base plate 7 in position. Threaded through the inner end of the base plate 7 is a plurality of adjusting finger screws 8, the lower ends of which bear upon the plate 4 and provide for angular adjustment between the base plate 7 and the turntable. Formed in the outer end of the base plate 7 is an open mouthed slot, indicated at 9.

Upstanding from the base plate 7 is a standard or bracket 10 having a plurality of ribs 11. Upstanding from the standard 10, in line with the vertical axis of the theodolite head, is a turn pin 12 upon which is mounted a rotatable eye piece support. This comprises a lower member 13 to which is secured, by a hinge 14, an upper member 15 carrying an eye piece or upright 16 in which is formed a limited observation opening, peep or sight hole, indicated at 17. Passing through the lower member 13 may be a suitable locking pin 18 by which the eye piece support may be retained in fixed position with regard to the standard 10 if necessary.

Removably secured to the base plate 7 by finger screws 19 or the like, are the inner ends of lower stays 20 the outer ends of which are secured by finger screws 21 or the like to the lower member 22 of a holding frame. The outer edge of the member 22 is curved as shown. Depending from the

member 22 is a clamping screw or stud 23 accommodated in the slot 9 of the base plate 7.

Secured by hinges 24 to the lower member 22 at each end thereof, is the lower end of a lower side section 25 of the frame. Secured to the upper end of each lower section 25, by intermediate hinges 26, is the lower end of an upper side section 27. Carried by the upper end of each section 27 are upper hinges 28 to which is secured an upper member 29 of the holding frame. The outer edge of the upper member 29 is curved to correspond with the conformation of the lower member 22.

Carried by each lower section 25 is a retaining arm 30 having a pivoted clip 31 adapted to engage the relative upper section 27. Carried by the upper member 29 of the holding frame, adjacent each side thereof, is a pivot pin 32. Pivoted to each pin 32 is the upper end of an upper stay 33, the lower end of which is removably retained to the standard 10 by the finger screws 34 or the like.

Pivotally mounted at each end of each of the members 22 and 29 is a strap 35. Each strap 35 forms a socket. Outstanding from each end of each of the members 22 and 29 and adjoining each socket is a holding pin 36.

Disposed between the upper and lower members 22 and 29 is a flexible transparent drawing sheet or surface 37 having secured at each of its corners a flexible loop 38 of cord or the like. The sheet is preferably formed of celluloid. Each loop 38 engages a holding pin 36 to temporarily retain the sheet 37 against the curved outer edges of the members 22 and 29. Marked upon the sheet 37 is a horizontal line indicated at 39 and a vertical line indicated at 40. The lines 39 and 40 intersect at or near the centre of the sheet. The outer ends of the lines 39 and 40 may be etched upon the sheet 37 and the intermediate portions drawn in ink.

Accommodated in the sockets formed by the straps 35, and clamping the upper and lower edges of the sheet 37 against the curved outer edges of the members 22 and 29, are upper and lower resilient clamping members 41 and 42. These may be formed of cane or any other suitable flexible material. The loops 38 retain the sheet 37 in position while the members 41 and 42 are being fitted.

Pivoted by a pivot pin 43 to the lower section 25 of each side of the holding frame, and securely held in position by a wing or finger nut 44 threaded upon the pivot pin 43, is an arm 45 having a metallic resting bracket 46.

Disposed between either bracket 46 and the upright 16 is a level carrier 47 having

outstanding from each of its ends a pin 48. Mounted in the carrier 47 is a suitable adjustable spirit level 49. One of the pins 48 rests upon one of the brackets 46 and the other is accommodated in the peep hole 17, whereby by manipulating one of the adjusting nuts 44, the respective bracket is clamped when the bubble of the level is in the middle of its run, the brackets then indicating the correct position to be occupied by the horizontal line 39.

The object of the sectional hinged sides and pivoted stays in the embodiment described is to permit of folding it compactly into a minimum of space. The upper member 15 of the eye piece support is first lowered, the lower stays 20 may then be disconnected from the base plate 7, and the upper stays 33 disconnected from the standard 10. The stays may be disconnected from the members 22 and 29 or they may be swung approximately into line therewith. The flexible clamping members 41 and 42 are removed from the sockets formed by the pivoted straps 35. The loops are removed from the pins 36 and the transparent flexible sheet is rolled up. The members 41 and 42 may now be replaced. The clips 31 are disengaged from the upper sections 27 of the sides of the holding frame. The sides may now be folded inwardly at the middle to lower the upper member 29. When moving the instrument from short distances it may be carried by the tripod. By slackening the clamping screw 23, however, the holding frame may be removed from the base plate 7. Upon removal of the wing nuts 6 the base plate 7 may be lifted from the upper plate 4 of the turntable. It will be obvious that the standard 10 could consist of a suitable column hinged at its base whereby it may be folded upon the base plate 7. The several elements when disconnected may be strapped together and, if desired, inserted in a suitable bag, envelope or the like.

To erect the invention the inner end of the base plate 7 is placed upon the turntable 4 and retained by the wing nuts 6. The level of the base plate 7 may be adjusted, approximately, by slackening the nuts 6 and turning the screws 8 after which the nuts are tightened up. The lower member 22 of the holding frame rests upon the outer end of the base plate 7 the screw 23 passing into the slot 9. The upper member 29 is lifted thereby elevating the side sections 25 and 27 to a vertical position. By engaging the clips 31 with the upper sections 27 the sides are retained in a vertical plane. The lower stays 20 are engaged with and retained by the finger screws 19, the upper stays 33 being engaged with and retained by the finger screws 34.

The theodolite head 3 is now levelled in

the usual way to obtain a vertical axis after which the apparatus is levelled by the spirit level 49. The pins 48 are placed one upon one of the brackets 46 and the other in the

5 peep hole 17.
Final adjustment is made by moving the corresponding arm 45 and locking the same by the wing nut 44 thereof when the bubble of the spirit level 49 is in the middle of its run. Each arm is adjusted in turn. When each arm 45 has been levelled with the peep hole 17 the level is removed and the transparent sheet 37 is placed in the holding frame.

15 The transparent sheet of celluloid or the like, when it has been rolled up is somewhat difficult to place in position. The loops 38 are therefore provided and placed over the pins 36 to temporarily secure the sheet while the upper and lower resilient clamping members 41 and 42 are engaged in the sockets formed by the straps 35.

20 The sheet is curved in order that equal divisions will represent degrees of arc in azimuth. It is firmly retained by the members 41 and 42. The line 39 is disposed in a horizontal line with the peep hole 17 and also in line with the upper edge of the levelled brackets 46. The apparatus is now ready for orientation. On the graduated circle 3 the bearing of some object, whose direction has been previously determined by compass or otherwise, is set off and the instrument is swung around until the peep hole 17 and the vertical line 40 of the sheet 37 are in line with the object. The circle 3 is secured by a clamping screw or the like common to a theodolite. The upper plate 4 is turned until the scope of the country or area to be sketched is visible through the sheet 37.

Viewing the area through the peep hole 17 the landscape outline may now be conveniently traced with an ordinary drawing pen in india ink. A wetted indelible pencil may be used but is not as efficient or convenient in use as a drawing pen and ink.

If the whole field is not included with one setting of the instrument the sheet 37 may be removed, a fresh sheet inserted, and the instrument set to view another area. It is necessary to orient the instrument for each fresh sheet as the vertical line 40 of each sheet may not occupy exactly the same position in the holding frame. The whole view as represented upon the several sheets is traced off when and as convenient on a continuous strip of tracing linen or the like, the position of the horizontal and vertical lines at each setting being shewn upon the strip and the bearing of each of the vertical lines being noted thereon. The radius of the curved outer edge of the members 22 and 29 being known the bearing of any object in the sketch may be scaled off. The sheet 37

may be conveniently disposed at such a distance from the upright 16 that a pre-determined length of the sheet either vertically or laterally represents one degree of arc. Should different radii for the curve to which the sheet 37 is bent be desired, suitable cleats may be provided to clamp the sheet closer to or further from the peep hole 17, such clamping devices carrying sockets or straps such as those before described.

The instrument may be mounted on a tripod and used without a graduated circle 3. It is necessary in such circumstances to ascertain by compass the bearing of some prominent object in the field of view at each setting, the bearing being noted upon the sketch. Successive settings should also overlap so that when preparing the final tracing a succeeding sheet may be placed under portion of the work traced from a preceding sheet. The foregoing and other precautions, however, would be within the knowledge of those skilled in the art and therefore taken without instruction to ensure accurate results.

The second embodiment of the invention-- (Figures 5 to 8) although it may be used for surveying, is more particularly applicable to landscape sketching and perspective views of architecture, machinery and the like. The base plate 7, standard 10, eye piece support and the upright 16 are retained in the form described with the exception that the slot 9 may be dispensed with. The holding frame comprises a lower member 51 the outer edge of which is straight. Carried by the member 51 are two guides 52 forming a guideway into which the outer end of the base plate 7 passes. Disposed below the guides 52 and bearing against the base plate 7 is a clamping bar 53 retained to the lower member 51 by clamping screws 54.

Hinged at their lower ends by hinges 55 are two sides 56 each having a bracket 57. It will be seen that a block 58 is provided below one side 56 in order that it will overlap the other side when folded or lowered.

Each side 56 may be disposed backwardly from the outer edge of the member 51 in order to provide a ledge or rest 59 for the transparent sheet hereinafter described. Upstanding from the outer edge of the lower member 51 are retaining lips 59. Mounted upon each side 56, at or near the upper end thereof, is a stop 60. Pivoted by a pivot pin 61 carried by each side 56 is a clamping cleat 62.

Resting upon the ledge 59 and retained by the cleats 62 is a transparent sheet 63 of glass or the like having marked thereon a horizontal line 163 and a vertical line 164 intersecting at or near the centre of the sheet. The outer ends of the lines 163 and 164 may be etched upon the sheet 63 and the intermediate portions drawn in in ink,

Pivoted by a pivot pin 65 carried by each bracket 57, is the lower end of a link 66. Threaded upon each pin 65 is a wing or other finger nut 67. Pivoted by a pivot pin 68 to the upper end of each link 66 is the inner end of an arm 69. Threaded upon each pin 68 is a wing or other finger nut 70. Pivoted by a pivot 71 to the outer end of each arm 69 is a metallic channel sectioned rest 72.

It will be seen that in the form shown in Figures 5 to 8, by slackening the screws 54 and bar 53 the holding frame may be adjusted in relation to the upright 16 to enlarge or diminish the field of view seen through the peep hole 17. By means of the links 66 and arms 69 the level carrier 47 before described and which is of constant length may be employed regardless of the adjustment made between the plane of the peep hole and the transparent sheet.

By slackening the nuts 67 and 70 the position of the rests 72 may be varied to support the level carrier 47 at one end, the other end resting in the peep hole 17 as before described. When the distance between the transparent sheet 63 and the upright 16 is such that the outer end of the carrier 47 would project beyond the said sheet 63 the nuts 70 are removed and the arms 69 are placed outside the sides 56, the nuts 70 then being replaced to function as previously. The outer ends of the arms 69 may now project beyond the sheet 63. The pivoted rests 72 are usually disposed at right angles to the arms 69 when supporting the level carrier. The spirit level is used to level the apparatus before the sheet 63 is inserted in the holder. When the sheet 63 is being inserted the horizontal line 163 thereon is aligned with the upper edge of the rests 72 and the sheet 63 is clamped into that position by the cleats 62. The view seen through the peep hole 17 is sketched upon the glass sheet by means of an ordinary drawing pen and india ink.

What I claim as new and desire to secure by Letters Patent is:—

1. Improvements relating to the production of landscape outline and other sketches, consisting in a base plate, an eye piece having a peep hole disposed above and supported from one end of said plate, a folding frame removably carried by said plate at its opposite end, a transparent sheet removably carried by the frame, said sheet having a vertical and a horizontal line thereon, and means embodying a level for indicating the correct position to be occupied by the horizontal line of the sheet relatively to the peep hole.

2. Improvements relating to the production of landscape outline and other sketches,

consisting in a theodolite head, a base plate carried by said head, a rotatable folding eye piece having a peep hole carried by said base plate, a removable folding frame carried by said base plate and disposed between the subject to be drawn and the peep hole, a transparent sheet removably carried by the frame, said sheet being sub-divided by a horizontal and a vertical line, a level removably disposed between the peep hole and a support adjacent the transparent sheet, and means for adjusting the end of the level adjacent said sheet to ascertain the position to be occupied by the horizontal line relatively to the peep hole.

3. Improvements relating to the production of landscape outline and other sketches, consisting in an eye piece having a peep hole, a frame disposed between the peep hole and the subject to be drawn, a flexible transparent sheet upon which the desired features of the subject are delineated as viewed through the peep hole, means for temporarily holding the sheet to the frame, and means for clamping the sheet to the frame.

4. Improvements relating to the production of landscape outline and other sketches, consisting in a support, a turntable carried thereby, a base plate resting upon the turntable, a rotatable eye piece having a peep hole carried by one end of the base plate, a folding holding frame removably carried by the other end of said base plate, means for retaining the frame rigid in relation to the base plate, a curved transparent sheet, means for clamping the sheet to the frame, said sheet having a horizontal and a vertical line intersecting thereon, a spirit level, and adjustable means carried by the frame to support the one end of the level adjacent said sheet and thereby ascertain the correct position for the horizontal line of the transparent sheet.

5. In combination, a tripod, a member rotatably mounted thereon, a peep hole mounted on the member at the axis of rotation, and a transparent screen removably mounted on said member in concentric relation to the peep hole and formed to receive outline marking directly thereon, whereby an object observed from the peep hole through the screen and drawn on the latter will have a predetermined scale relation with the drawing on the screen.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILFRED McCALLUM.

Witnesses:

C. HANLYN HARRIS,

HENRY K. N. MACDONNELL.