Oct. 26, 1943. A. LANGSNER 2,332,860

DRAFTING INSTRUMENT

Filed Aug. 16, 1940 3 Sheets-Sheet 1

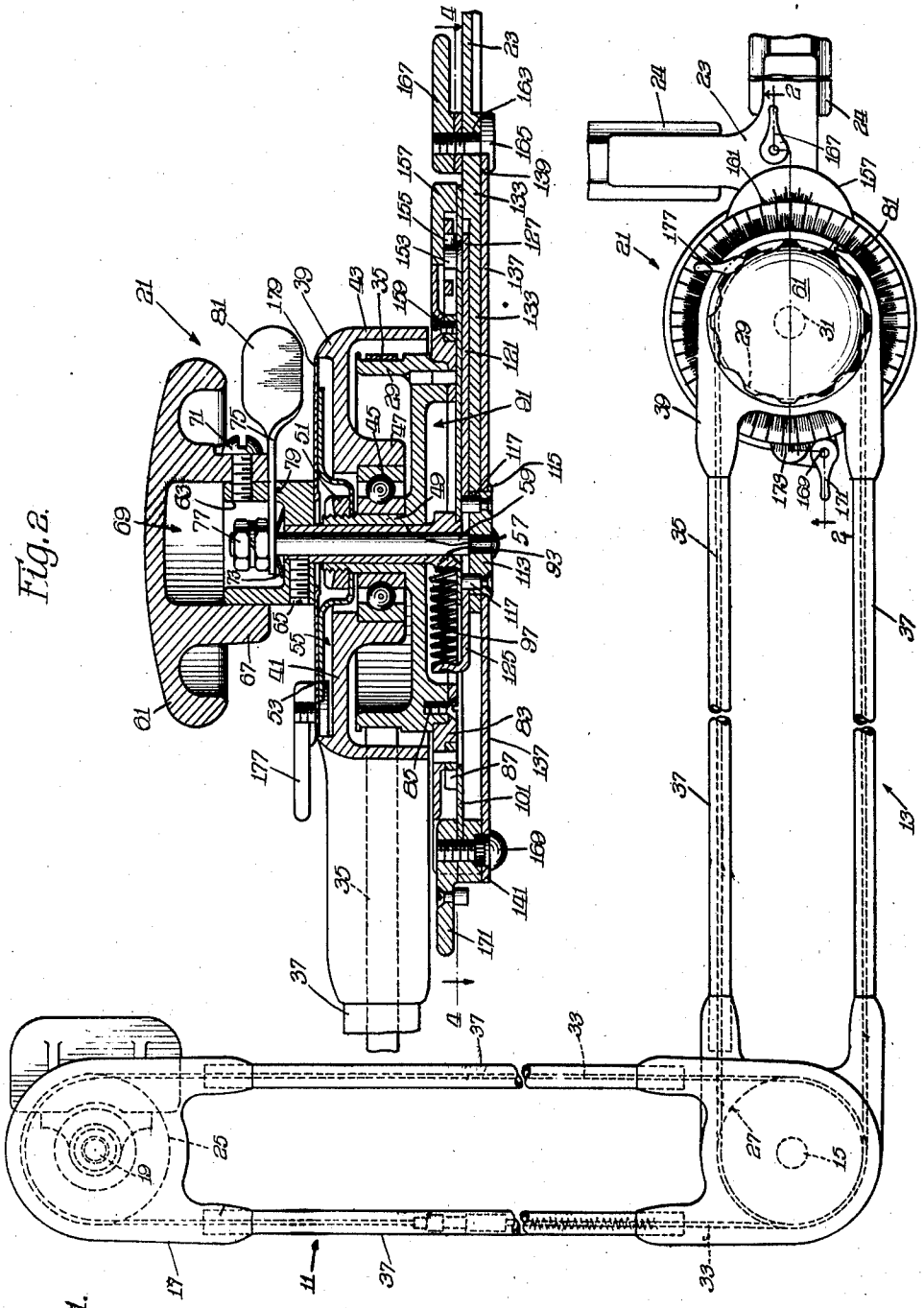


Fig. 2.

Fig. 1.

INVENTOR.
Adolph Langsner
BY
Spencer, Marzall, Johnston & Cook
Atty's.

Oct. 26, 1943. A. LANGSNER 2,332,860

DRAFTING INSTRUMENT

Filed Aug. 16, 1940 3 Sheets-Sheet 2

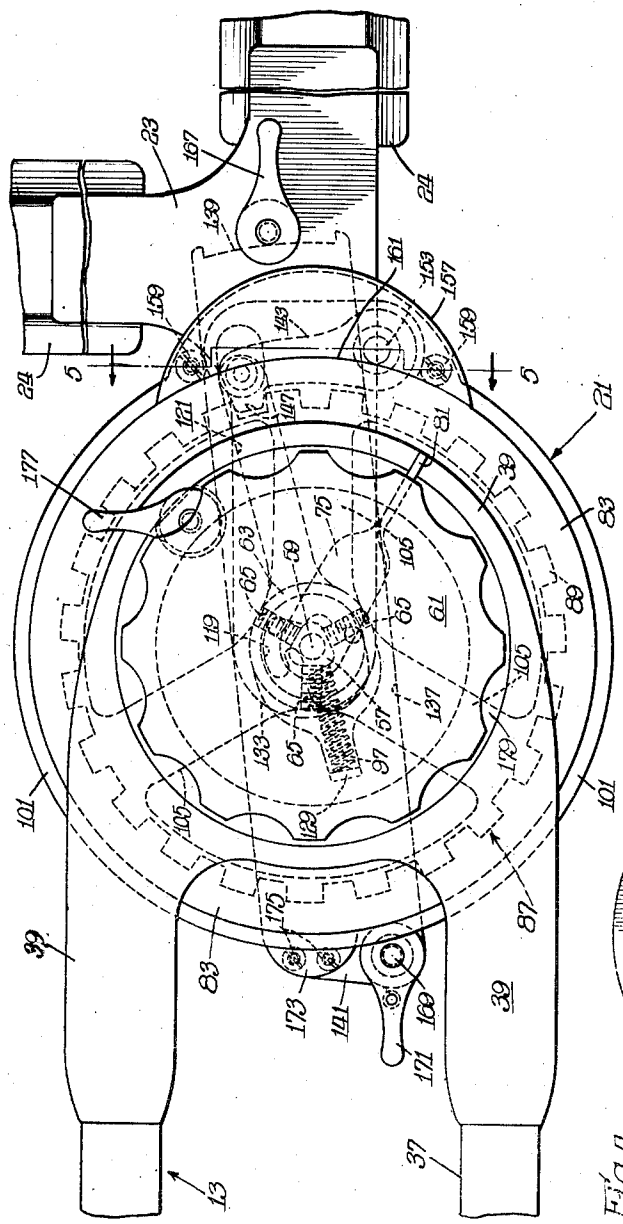


Fig. 3.

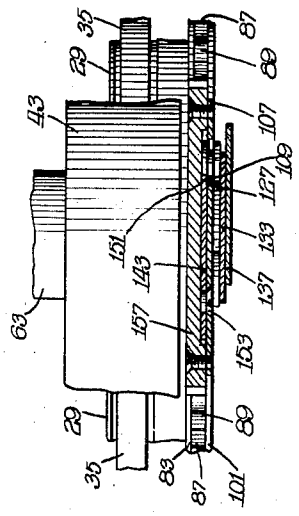


Fig. 5.

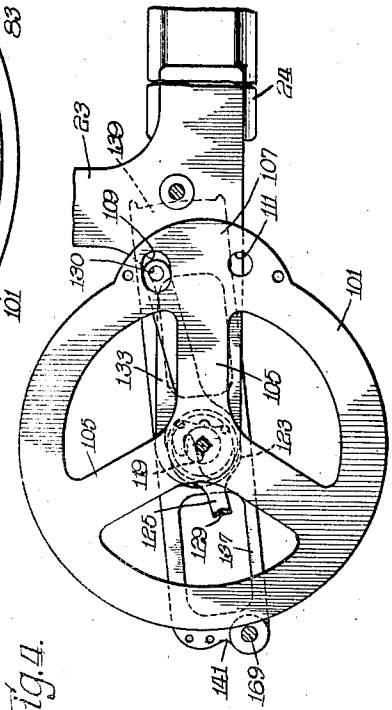


Fig. 4.

INVENTOR.
Adolph Langsner

BY Spencer, Marzall, Johnston & Cook
Atty's.

Oct. 26, 1943. A. LANGSNER 2,332,860

DRAFTING INSTRUMENT

Filed Aug. 16, 1940 3 Sheets-Sheet 3

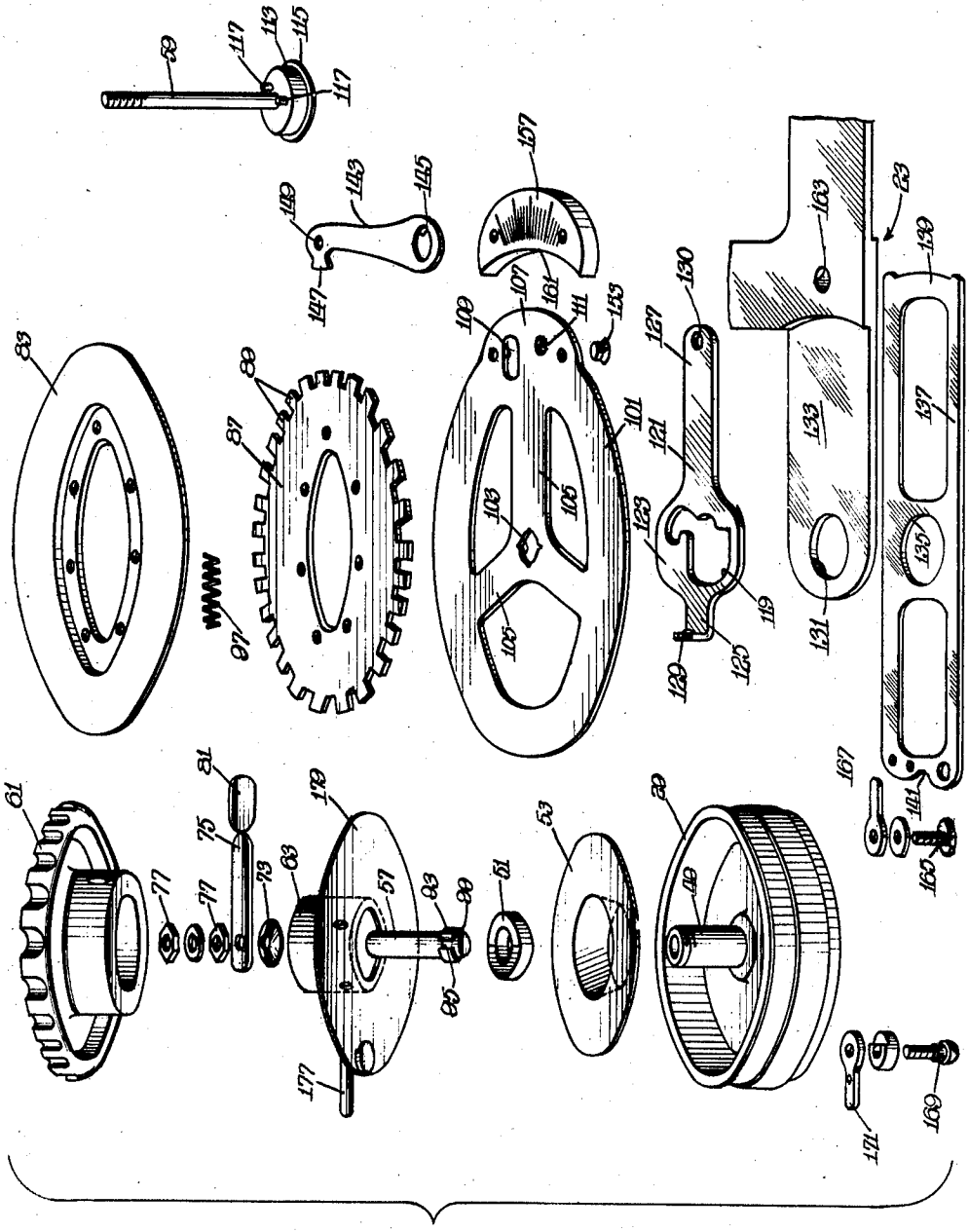


Fig. 6.

INVENTOR.
Adolph Langsner
BY Spencer, Marzall, Johnston & Cook.
Atty's.

Patented Oct. 26, 1943

2,332,860

UNITED STATES PATENT OFFICE

2,332,860

DRAFTING INSTRUMENT

Adolph Langsner, Chicago, Ill., assignor to Eugene Dietzgen Co., Chicago, Ill., a corporation of Delaware

Application August 16, 1940, Serial No. 352,833

19 Claims. (Cl. 33—79)

My invention relates in general to drafting apparatus and has more particular reference to means facilitating the angular adjustment of ruling guides in drafting apparatus.

An important object of the present invention is to provide simplified angularity adjusting means particularly adapted for use in parallel motion drafting apparatus; a further object being to provide protractor means, together with readily releasable latch means for holding the protractor means in adjusted position.

Another important object is to provide a protractor assembly providing full rotation of the scales.

Another important object is to provide a protractor assembly for the angulation of ruling guides, in which the protractor may be rapidly and easily set to any one of a number of predetermined set angularity stations and latched in place, in combination with vernier means, whereby ruling guides, or equivalent elements forming a part of the protractor assembly, may be adjusted readily to any position intermediate the limits determined by the predetermined angularity stations.

The foregoing and numerous other important objects, advantages and inherent functions of the invention will become apparent as the same is more fully understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is a plan view of drafting apparatus containing a protractor assembly embodying my present invention;

Figure 2 is an enlarged sectional view taken substantially along the line 2—2 in Figure 1;

Figure 3 is a top plan view of the protractor head shown in Figure 2;

Figure 4 is a detail sectional view taken along the line 4—4 in Figure 2;

Figure 5 is a detail transverse sectional view taken along the line 5—5 in Figure 3; and

Figure 6 is an exploded view, showing the several parts of the protractor in perspective.

To illustrate my invention, I have shown on the drawings parallel motion mechanism, comprising a pair of arm elements 11 and 13 connected together for relative rotation about an axis 15, means 17 being provided at the opposite end of the arm 11 for anchoring it on a drafting board or table for relative rotation about a stationary axis formed preferably by a stationary pin 19. The end of the arm 13 opposite from the pivot 15 carries support means comprising a protractor head 21, on which is mounted a ruling guide member 23 for parallel movement on the drafting board. The invention is not necessarily restricted to the form and arrangement of the arms 11 and 13; in fact, any suitable parallel motion or pantograph device may be employed as a mounting for the protractor head 21. As shown, however, the parallel motion apparatus comprises pulleys interconnected by driving belts in the arms 11 and 13, there being, in the illustrated embodiment, a pulley 25 fast on the pin 19 at the supported end of the arm 11, a pulley 27 mounted for rotation about the axis 15, and a pulley 29 mounted for rotation about an axis 31 in the protractor head. Flexible belt means 33 and 35 drivingly connect the pulley 25 with the pulley 27, and the pulley 27 with the pulley 29, so that the pulley 29 will remain in fixed angular position with respect to a table on which the device may be mounted for operation, regardless of the movement thereof within the operating range of the device.

The arms 11 and 13 preferably comprise each a pair of spaced housing elements and tubular spacing elements 37, the opposite ends of which are secured to the housing elements to support the same in spaced-apart relationship. The housing element, at the supported end of the arm 11, encloses the top and sides of the pulley 25, and the housing elements, at the connected ends of the arms, co-operate to enclose the top, sides and bottom of the pulley element 27, while the housing 39, at the protractor-carrying end of the arm 13, encloses the top and sides of the pulley 29. The flexible driving belts 33 and 35 extend in the spacing tubes 37 and around the pulleys in the housings.

The housing 39 has a top wall 41 and marginal walls 43 enclosing the rim of the pulley 29, which is rotatably mounted with respect to the housing preferably by roller bearing means 45 supported in a sleeve portion or embossment 47 formed centrally on the wall 41. The pulley has a central axle portion 49 on which the inner race of the roller bearing is clampingly secured, as by means of a nut 51, said nut also clamping the central portions of a clamping plate 53, the marginal portions of which extend in a cavity or depression 55 formed in the top of the housing 39.

The axle portion 49 of the pulley is of sleeve-like character and receives, rotatably therein, a sleeve member 57 through which extends a stem 59. The sleeve-like member 57 has an end extending upwardly of the top of the housing 39 and carries a manually operable knob or handle 61 fastened to the projecting end of the member 57 by means of a cup-shaped mounting element 63. The bottom of the element 63 has an opening receiving the end of the member 57, which is clamped in place by means of a fastening screw 65. The knob 61 is formed with annular portions 67 forming a cavity 69 into which the annular walls of the cup element 63 may be slidingly fitted to enclose the cavity 69, the knob

being secured in place on the element 63 as by means of a screw 71. The stem 59 is angularly turnable within the sleeve element 57 and has an end projecting into the cavity 69, said end being provided with a spring washer 73 and a lever 75, which is secured to the end of the stem 59 as by means of clamping nuts 77. The lever extends outwardly of the cavity 69 through a slot 79 formed in the walls of the cup element 63 and has a finger piece 81 disposed in position adjacent the rim of the knob 61.

The lower end of the pulley 29 is fitted with an annular scale plate 83 which is secured to the pulley, as by screws 85, said scale plate extending beneath and outwardly of the walls 43 of the housing. This scale plate, on its under side, carries a notched wheel 87 having spaced teeth 89. The pulley 29 is preferably formed on its under side with a cavity 91 into which an end of the sleeve member 57 extends, said end being formed with a head 93 formed with a notch 95 for receiving an end of a spring 97. Adjacent the head 93, the member 57 is formed, as at 99, to receive and support a spider member 101 having a central opening 103, Fig. 6, adapted to receive the mounting portion 99 in non-rotating fashion, so that the member 101 is fixed on the sleeve member 57. Outwardly of its central portions, which are attached on the sleeve member 57, the members 101 comprises radially extending arms 105 and an annular rim supported by the arms 105, said rim, on one side, having an extension 107 formed with a radial elongated opening 109 and a perforation 111, Fig. 6.

The stem 59 has an end projecting outwardly from the headed end of the member 93, and this projecting end of the member 59 carries a disk 113, Figs. 2 and 6, having a flanged rim 115 and carrying studs 117 adapted for engagement in a cut-out portion 119 formed in a link 121. This link is preferably formed as a sheet metal stamping, Fig. 6, and has a central enlarged portion 123 in which the cut-out opening 119 is formed. The link also comprises finger portions 125 and 127 extending outwardly of the enlarged portion 123 at the opposite ends thereof, the terminal end of the finger portion 125 being bent upwardly to form a lug 129 in position to extend between the arms 105 of the member 101. This lug 129 is formed to receive an end of the spring 97, which is arranged in compression between said lug 129 and the seat formed by the notch 95 in the head 93 of the member 57. The finger 127 is formed at its end with an opening 130.

It will be seen from the foregoing that the link 121 is normally urged by the spring on the stem 59 in the direction of the lug 129.

The disk 113 extends in an opening 131 formed in a ruling guide support member 133, which extends radially outwardly of the stem 59 and outwardly of the portion 107 of the spider member 101. Beneath the ruling guide member 133, the disk 113 extends in an opening 135, Fig. 6, formed centrally in a plate 137, which has an end 139 underlying the ruling guide member 133 and an end 141 extending radially from the disk 113 in a direction opposite to the end 139, Fig. 6.

The spider member 101 carries a latch detent 143, Figs. 5 and 6, preferably comprising a sheet metal stamping having an opening 145 at one end, the other end of the detent being formed with a latching tooth 147 adapted to engage between the teeth 89 of the latching wheel 87. Adjacent the tooth 147, the detent is formed with a perforation 149. The finger 127 underlies the member 101 with the perforation 130 of the finger extending opposite the elongated opening 109. The detent 143 lies upon the extension 107, with the opening 145 in alignment with the opening 111 and the opening 149 opposite the opening 109. A pin 151 extending through the opening 109 drivingly interconnects the finger 127 with the detent 143, and the detent is rockingly mounted on the member 101 by means of a pin 153 which is fastened in the opening 111 and which carries an annular roller 155, Fig. 2, in position extending within the opening 145 of the detent. The roller and detent are enclosed on the member 101 by means of a cover plate 157 which is secured on the portion 107 by means of fastening screws 159. The cover plate 157 has a curved edge 161 which slidingly fits against the peripheral edge of the scale plate 83, the upper marginal edges of which contain protractor scale graduations. The plate 157 is preferably graduated along its edge 161 with indicia forming a vernier scale for use in conjunction with the protractor scale on the adjacent edge surfaces of the scale plate 83.

Outwardly of the cover plate 157, the ruling guide member 133 is formed with a perforation 163 in which is arranged a clamping nut 165 having a head extending on the under side of the guide support and a clamping lever 167 on the upper side of the guide support adjacent the vernier plate 157. The head of the clamping member 165 receives the end 139 of the plate 137, which thus may be clamped in adjusted angular relationship with respect to the guide support 133 by means of the clamp. The end 141 of the plate 137 carries a clamp 169 comprising a screw, a clamping block and a lever 171, which clampingly receives the rim of the spider member 101 on which the latching detent 143 is mounted. The end 141 of the plate 137 also carries an index plate 173 which is secured to the plate 137, as by screws 175. This index plate has an edge abutting the marginal edge of the scale plate 83 in alignment vertically opposite the vernier scale on the cover plate 157.

The teeth 89 of the indexing member 87 correspond with predetermined protractor angularity and preferably represent 15 degree intervals for the purpose of setting the scales at standard angles of 15 degrees and multiples thereof. The detent normally is in engagement between a pair of teeth 89 under the influence of the spring 97 which, acting through the link 121, normally holds the detent in latching position. The thumb-piece 81 is in position to be readily engaged by the thumb of the left hand when placed on the knob 61. By pressing on the thumb piece in a counterclockwise direction, viewing Figure 3 of the drawings, the stem 59 will be rotated and cause the studs 117 to draw the link 121 in a direction to release the detent from the wheel 87. When pressure in a counter-clockwise direction on the thumb-piece 81 is released, the link 121 and the detent will be returned by the spring 97 to detent latching position, the shape of the cut-out 119 being such as to prevent the studs 117 from locking the member 121 in released position. For permanent disengagement of the detent 143, the finger piece 81 may be moved in a clockwise direction, viewing Figure 3 of the drawings, the cut-out 119 being so shaped that when the disk 113 is rotated in a clockwise direction, the studs will become latched in the cut-out in a fashion holding the member 121 in position with the detent permanently disengaged from the latching ring 87. When the detent is disengaged from the

latching ring 87, the handle 61 may be turned, thus turning the sleeve member 57 and with it the plate 101, as well as the ruling guide support which is clamped to the plate 101 by means of the clamps 165 and 169, Fig. 6. Movement of the plate 101 in this fashion is indicated on the scale by means of the vernier scale on the member 157, which is fast on and moves with the member 101. Thus the ruling guide may be set to any desired intermediate angle less than 15 degrees.

When the device has been set to some intermediate point by disengaging the pawl, it is necessary that the parts be clamped or held in adjusted position, and in order to do this, I provide a clamp 177 fastened on the member 57 by means of a disk 179, which is secured on the bottom of the cup-shaped element 63 and which extends therefrom in position to cover the cavity 55 above the plate 53. The clamp 177 thus is turnable with the handle 61 and always remains in a fixed position with respect to the handle. The clamp 177, however, has clamping relationship with the edge of the plate 53 in order to latch the ruling guide support to the pulley when the clamp 177 is tightened. It will be noted that the clamp 177 is located directly below the knob 61 in position to facilitate manipulation thereof, as my means of the index finger of the draftsman who manipulates the protractor with the left hand.

The clamp 169 is provided to permit the adjustment of the support 133 at a desired angle without interfering with the setting of the scale plate with respect to the vernier scale. This structure and facility is of value where the drawing of auxiliary views is necessary at projection angles different from that in which the main view is drawn. If, for example, it is necessary to draw an auxiliary sketch projected at a predetermined angle with respect to the projection angle of the main view, the clamp 169 may be freed, thus permitting the support member 133 to be turned freely on the disk 113 without interfering with the angular position of the member 101. By means of the index 173, the protractor may be set to the required position, whereupon the lever 171 may be tightened, and it should be noted that the vernier scale carried by the member 101 has not been shifted with respect to the scale plate 83. This means simply that any further movement of the scales, in drawing the auxiliary view, can be started from the new base line or center line by manipulating the thumb piece 81, as heretofore mentioned, and angles may be set off above or below the new base line determined by the setting of the index 173, and the adjustment can be referred to the new base line merely by reading off the angles on the vernier scale. After completion of the auxiliary view, the protractor can be brought back to the original base line merely by releasing the clamp 169 and turning the scales into the position that will bring them back to the original base line, as indicated by the index 173.

The clamp 165 may be used to initially line up the guide member 133, as when drawings are placed upon the drawing board for the purpose of making changes or for completing the same. The draftsman first fastens down the drawing approximately in alignment. Thereafter exact alignment of the drafting machine with the board-mounted drawing may be had by releasing the clamp 165 and shifting the member 133 into exact alignment, this being accomplished with the protractor adjusted to zero position. The clamp 165 is then tightened, and drawing operations may proceed with the assurance that the drafting machine is properly aligned with the work sheet.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the form herein disclosed being a preferred embodiment for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a notched latching element on said member, a latching detent, a carrier for said detent, said guide being angularly adjustable with respect to said carrier, means to secure said carrier in adjusted position against angular movement with respect to said guide, and manually operable means for actuating said detent.

2. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a latching detent, a carrier for said detent, said guide being angularly adjustable with respect to said carrier, means to secure said carrier in adjusted position against angular movement with respect to said guide, yielding means normally biasing said detent toward latched position with said keeper, and manually operable means to release said detent against the influence of said yielding means.

3. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a detent carrier, said guide being angularly adjustable with respect to said carrier, a detent pivoted on said carrier in position to co-operate with said keeper means to secure said carrier in adjusted position against angular movement with respect to said guide, spring means normally urging the detent toward latching engagement with said keeper, and manually operable means to release said latch from the keeper against the influence of said spring means.

4. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a latching detent, a carrier for said detent, said guide being angularly adjustable with respect to said carrier, means to secure said carrier in adjusted position against angular movement with respect to said guide, yielding means normally biasing said detent toward latched position with said keeper, and manually

operable cam means for releasing said latch against the influence of said yielding means.

5. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a latching detent, a carrier for said detent, said guide being angularly adjustable with respect to said carrier, means to secure said carrier in adjusted position against angular movement with respect to said guide, yielding means normally biasing said detent toward latched position with said keeper, and manually operable cam means for releasing said latch against the influence of said yielding means, said cam means serving to latch the detent in released position.

6. A drafting machine comprising parallel motion apparatus including a supported member carried in the apparatus for parallel movement within the operating limits of the apparatus, means forming a protractor scale on said member, a ruling guide angularly adjustable on said member with respect to said scale and means for securing said guide in adjusted angular position on the member comprising a notched latching ring on said member, a latching detent, a carrier supporting said detent in position to latchingly cooperate with the notched ring, means to support the guide for angular movement with respect to said carrier and to secure the guide in adjusted position with respect to the carrier, and manually operable means for actuating the detent.

7. A drafting machine comprising parallel motion apparatus including a housing, open at the bottom and having a dependent marginal wall, and a turnable member supported within said marginal wall for parallel movement within the operating range of the apparatus, rimmed means on said member and having portions extending beneath and outwardly of the marginal walls of the housing and carrying a protractor scale, latching means for supporting a ruling guide for angular movement with respect to said scale and for securing said guide on said member in adjusted relationship with respect to said scale, said latching means comprising a notched latching ring secured on said member in position extending beneath the outwardly extending portions of the rimmed means, a latching detent, a carrier supporting said detent in position to cooperatively engage the latching ring and means to secure said ruling guide in adjusted relatively angular relationship on said carrier.

8. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a latching detent, a carrier for said detent, said guide being angularly adjustable with respect to said carrier, means to secure said carrier in adjusted position against angular movement with respect to said guide, yielding means normally biasing said detent toward latched position with said keeper, and cam means manually operable in one direction to release said detent against the influence of said yielding means, and operable in another direction to release and latch said detent in released position against the influence of said yielding means.

9. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a carrier angularly adjustable with respect to said member, a latch keeper on said member, a latching detent on the carrier to latch it in adjusted angular position with respect to the member, means to secure said guide in angularly adjusted position on said carrier, yielding means normally urging said detent toward latched position with said keeper, and means manually operable to release said detent against the influence of said yielding means.

10. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a carrier angularly adjustable with respect to said member, a latch keeper on said member, a latching detent on the carrier to latch it in adjusted angular position with respect to the member, means to secure said guide in angularly adjusted position on said carrier, yielding means normally urging said detent toward latched position with said keeper, and means manually operable in one direction to release the detent against the influence of said yielding means, and operable in another direction to release and latch said detent in released position against the influence of said yielding means.

11. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier and means to secure the guide in angularly adjusted position on the carrier, a turnable stem formed with a control handle on said carrier for moving the same with respect to said keeper, a latching detent on said carrier in position to latchingly engage said keeper, yielding means normally biasing said detent on said carrier toward latched position with said keeper, and manually operable means extending adjacent said handle and operable to release said detent from said keeper against the influence of said yielding means.

12. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier and means to secure said guide in angularly adjusted position on the carrier, a detent on said carrier in position to latch with said keeper, a link connected with said detent for actuating the same, said link being formed with cam means, and a manually operable driving cam associated with said cam means.

13. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier for said guide, a detent on said carrier in position to latch with said keeper, a link connected with said detent for

actuating the same, said link being formed with cam means, a manually operable driving cam associated with said cam means, yielding means normally urging the detent toward latched position with said keeper, said driving cam and co-operating cam means serving to release the detent against the influence of said yielding means when the driving cam is moved from detent latched position, said cam means comprising shoulders formed in said link and said driving cam comprising movable studs in position to engage said shoulders.

14. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier for said guide, a detent on said carrier in position to latch with said keeper, a link connected with said detent for actuating the same, said link being formed with cam means, a manually operable driving cam associated with said cam means, yielding means normally urging the detent toward latched position with said keeper, said driving cam and co-operating cam means serving to release the detent against the influence of said yielding means when the driving cam is moved from detent latched position, said driving cam comprising a turnable stem formed with a radially extending finger piece and a head carrying studs in position to engage said cam means.

15. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier supporting said guide, a turnable stem formed with a control handle on said carrier for moving the same with respect to said keeper, a latching detent on said carrier in position to latchingly engage said keeper, yielding means normally biasing said detent on said carrier toward latched position with said keeper, cam means drivingly connected with said detent for actuating the same, and manually operable cam actuating means extending adjacent said handle, said guide being angularly adjustable with respect to said carrier, and means to clamp said guide on said carrier in angularly adjusted position.

16. A drafting machine comprising a protractor scale, parallel motion apparatus including a support member supporting said scale, a guide, and means for mounting the guide on said member in adjusted angular relationship with respect to said scale, said means comprising a turnable member angularly adjustable with respect to said support member, means to secure said turnable member in any one of a predetermined number of angularly adjusted positions with respect to the support member, an auxiliary support member angularly adjustable with respect to said turnable member, and means to clamp said auxiliary support member in any angularly adjusted position within a predetermined range with respect to said turnable member, said guide being carried by and turnable with said auxiliary support member.

17. A drafting machine comprising a protractor scale, parallel motion apparatus including a support member supporting said scale, a guide, and means for mounting the guide on said member in adjusted angular relationship with respect to said scale, said means comprising a turnable member angularly adjustable with respect to said support member, means to secure said turnable member in any one of a predetermined number of angularly adjusted positions with respect to the support member, an auxiliary support member angularly adjustable with respect to said turnable member, and means to clamp said auxiliary support member in any angularly adjusted position within a predetermined range with respect to said turnable member, said guide being carried by and turnable with said auxiliary support member, said guide being angularly adjustable with respect to the auxiliary support member, and clamping means for securing the guide and support member together in angularly adjusted position.

18. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier supporting said guide, said carrier comprising a spider member and being releasably interconnected with said guide, whereby said carrier may be maintained in fixed position with respect to said scale during adjustment of said angular relationship of said guide with respect to said scale, a turnable member formed with a control handle and means connecting the turnable member to said carrier for moving the same with respect to said keeper, a latching detent on said carrier in position to latchingly engage said keeper, yielding means normally biasing said detent on said carrier toward latched position with said keeper, cam means drivingly connected with said detent for actuating the same, and manually operable cam actuating means adjacent said handle.

19. A drafting machine comprising a protractor scale, parallel motion apparatus including a member supporting said scale, a guide, and means for mounting said guide on said member in adjusted angular relationship with respect to said scale, said means comprising a latch keeper on said member, a carrier supporting said guide, said guide and said carrier being operable independently of each other, a turnable member formed with a control handle on said carrier for moving the same with respect to said keeper, a latching detent and means to secure the same to said carrier in position to latchingly engage said keeper, yielding means normally biasing said detent on said carrier toward latched position with said keeper, cam means drivingly connected with said detent for actuating the same, and manually operable cam actuating means extending adjacent said handle, the member being formed with a hub and being rotatably mounted in said parallel motion apparatus, said handle being connected with said carrier by means of a sleeve element turnably mounted in said hub, and said manually operable cam actuating means comprising a stem turnably mounted in said sleeve element.

ADOLPH LANGSNER.