

May 26, 1931.

T. A. DE POSTELS

1,807,237

DRAFTING APPLIANCE

Filed Dec. 15, 1928

3 Sheets-Sheet 1

Fig. 1.

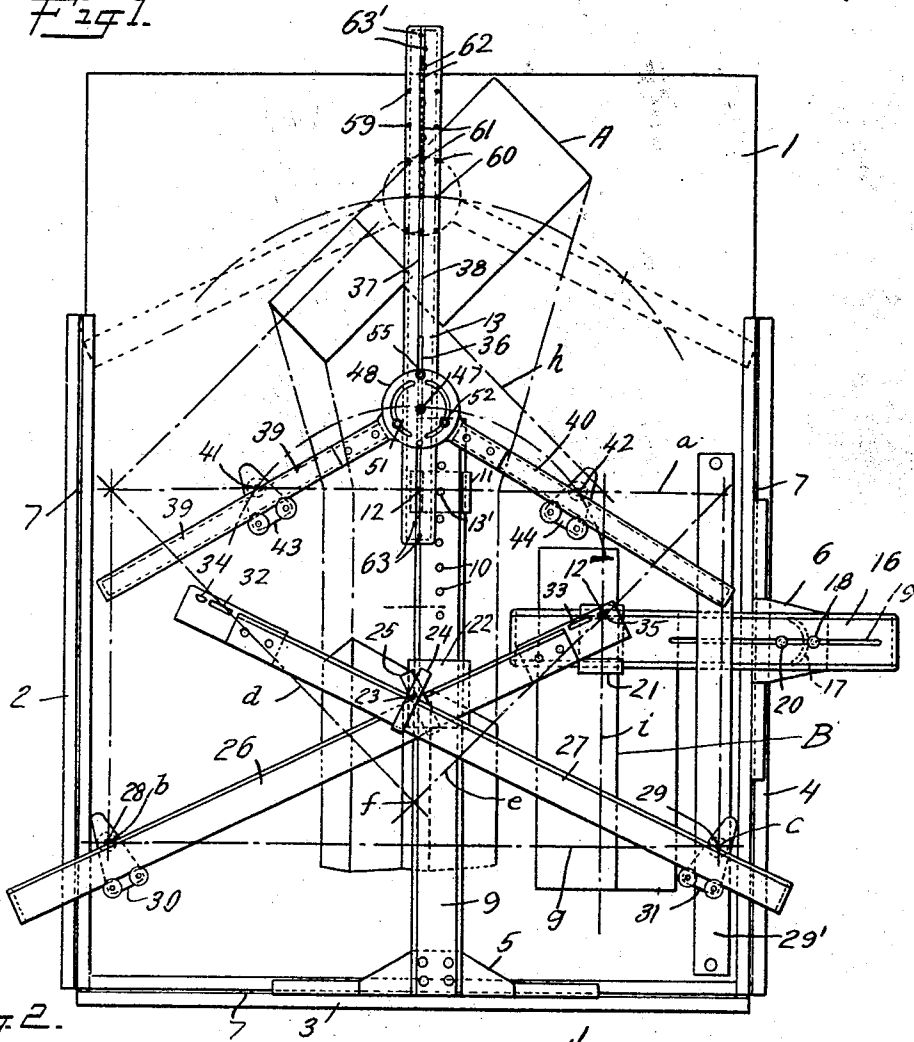


Fig. 2.

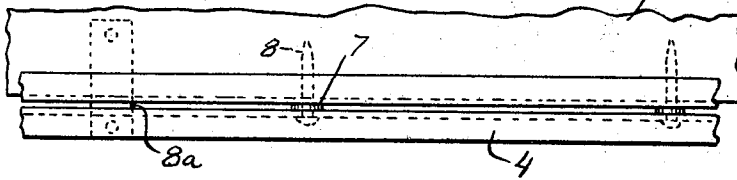


Fig. 3.

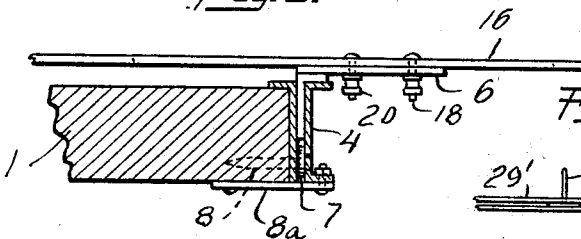
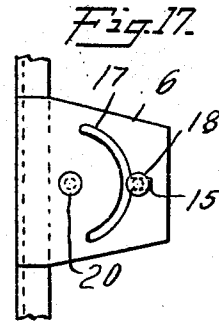


Fig. 17.



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Fig. 5.

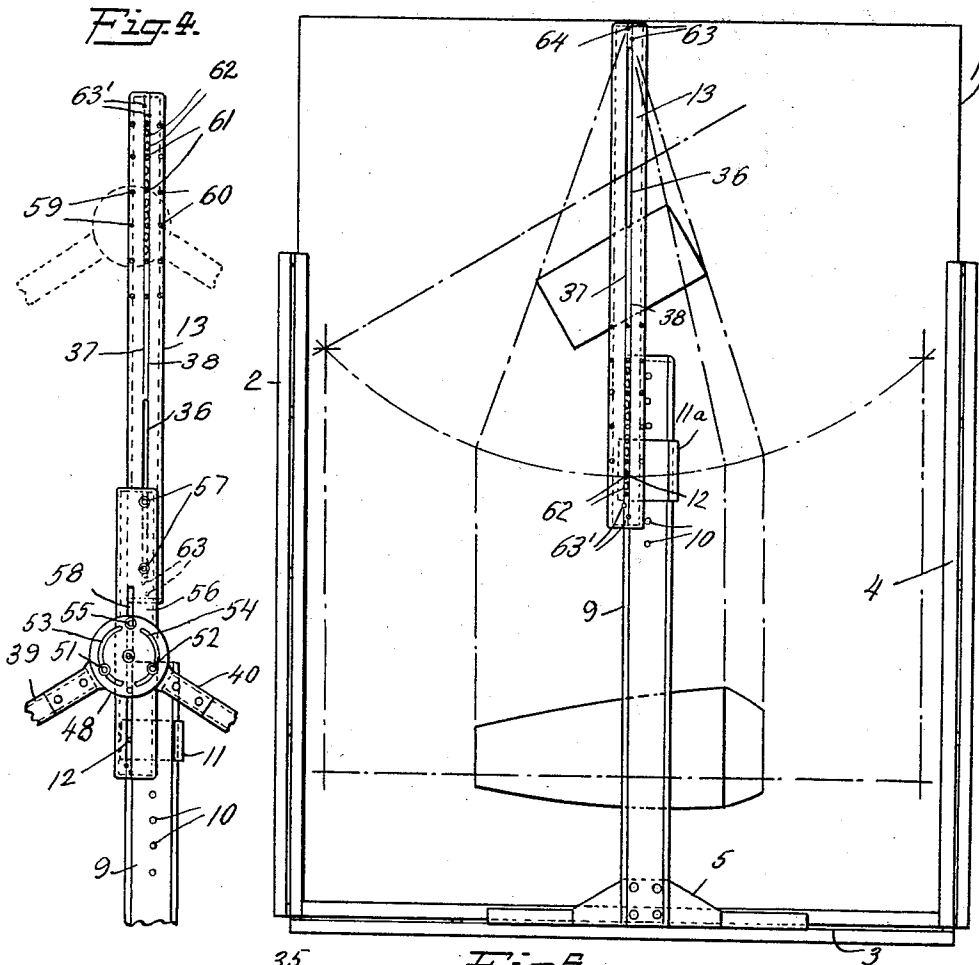


Fig. 6.

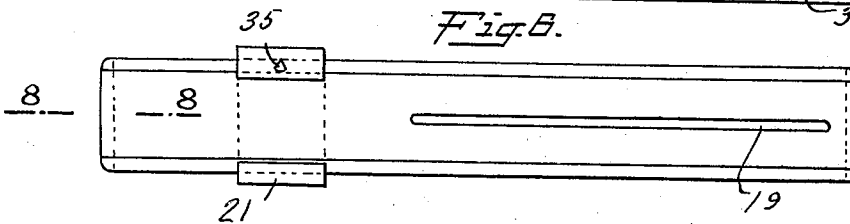


Fig. 7.

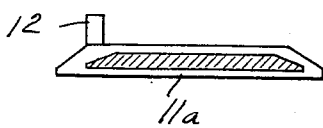
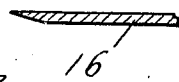


Fig. 8.



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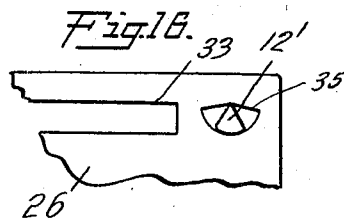
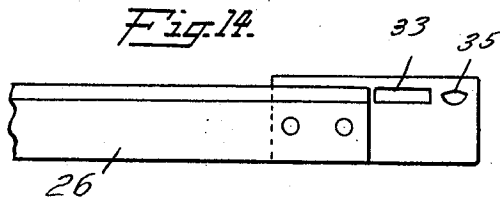
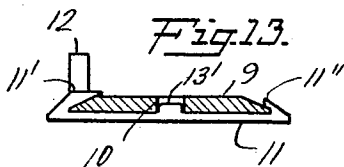
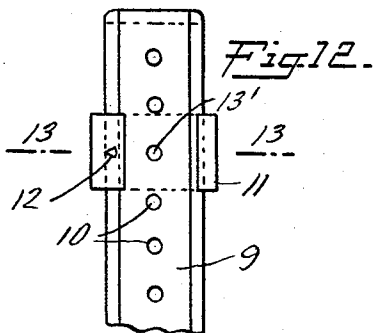
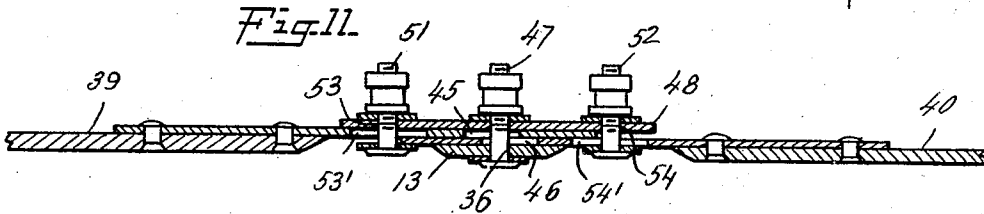
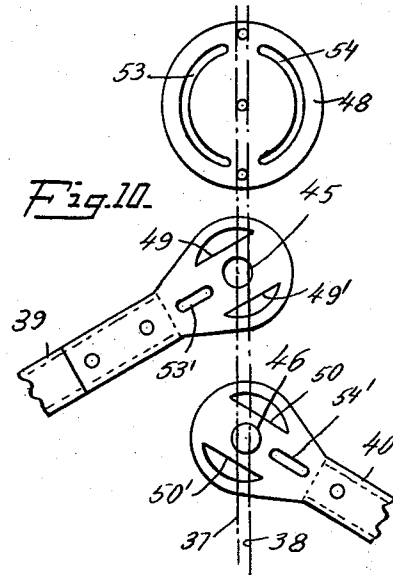
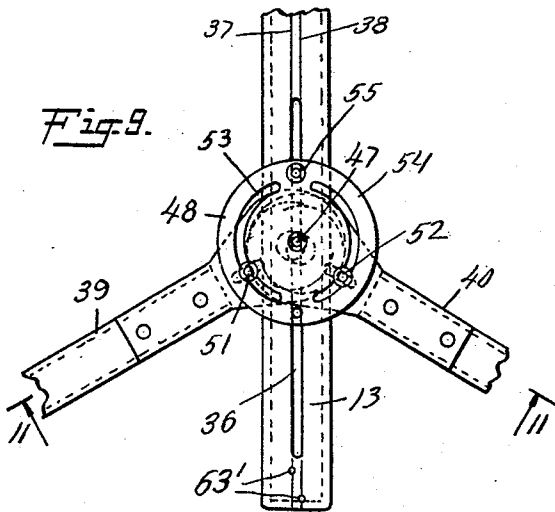
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3 Sheets-Sheet 3



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DRAFTING APPLIANCE

Application filed December 15, 1928. Serial No. 326,260.

This invention relates to drafting appliances and particularly to improvements in appliances for use in making perspective drawings. In general this invention may be regarded as constituting improvements in drafting appliances of the type claimed in my Patent No. 1,657,301 of January 24, 1928, the improvements relating principally to the construction and mechanical interconnection of various parts of such drafting appliances.

It is an object of this invention to provide rulers, guiding, directing and indicating members of improved construction and improved means for interconnecting such members whereby accurate perspective drawings can be made with a minimum of effort and in the shortest possible time.

In general the invention claimed in my Patent No. 1,657,301 includes rulers for use in drawing the lines which, if extended, pass through the vanishing points, another ruler cooperating with the rulers just mentioned and adapted to indicate true heights of the object, and directing and indicating devices for use in determining the positions of the points and of the vertical lines of the perspective drawing.

The present invention includes a ruler movable over the perspective drawing and provided with a pivot pin support or slider adjustably secured thereto, this slider being reversible to permit positioning of the pivot pin in alignment with either side of the ruler as may be desired. The improved sliders or pivot supports of the present invention may comprise flexible members engaging the rulers only at the side edges and on the bottom surface thereof whereby the sliders are readily removable from the rulers, the sliders being constructed in such a manner as to present no obstruction to the draftsman using the appliance. By providing movable pivot supports or sliders associated with the rulers it is not necessary to change the positions of the rulers whenever it is desired to change the position of the pivots.

This invention includes rulers of improved construction and improved means associated with said rulers for guiding the same during the process of making perspective drawings.

The invention may be employed not only for lineal perspectives but also for the purpose of making curvilinear relief, theatrical and radial perspectives, and it is also useful in pantographic work for enlarging or reducing, or changing proportions in different ways at the same time.

The improved ruler members are preferably provided with beveled edges facilitating the sliding of one member over another, and facilitating the sliding of the several members over all projections on the surface of the board.

The various objects and advantages of this invention will be more apparent upon considering the following detailed description which is to be taken in conjunction with the accompanying drawings in which

Fig. 1 is a plan view of one embodiment of the invention;

Fig. 2 is an enlarged plan view of a portion of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged section view of a portion of the apparatus shown in Fig. 1;

Fig. 4 is a plan view of apparatus embodying my invention;

Fig. 5 is a plan view of my improved apparatus illustrating its application to the making of curvilinear perspectives;

Fig. 6 is an enlarged plan view of a portion of the apparatus shown in Fig. 1;

Fig. 7 is a section view of part of the apparatus of Fig. 5;

Fig. 8 is a section view taken on line 8—8 of Fig. 6;

Fig. 9 is an enlarged fragmentary plan view of a portion of the apparatus shown in Fig. 1;

Fig. 10 is a plan view of the several parts shown in Fig. 9, the parts being displaced one from another for purposes of illustration;

Fig. 11 is a section view of the part shown in Fig. 9, this view being taken along the broken line 11—11 of Fig. 9;

Fig. 12 is an enlarged plan view of a portion of the apparatus shown in Fig. 1;

Fig. 13 is a section view taken on line 13—13 of Fig. 12;

Fig. 14 is an enlarged plan view of a portion of the apparatus shown in Fig. 1;

Fig. 15 is an elevation of the apparatus shown in Fig. 14;

Fig. 16 is an enlarged fragmentary view of part of the apparatus shown in Fig. 14 showing its cooperation with a pivot pin;

Fig. 17 is a plan view of part of the apparatus shown in Fig. 1;

Fig. 18 is an elevation of a portion of the apparatus shown in Fig. 1.

Referring to Fig. 1 I have illustrated at 1 a drawing board which may be of any suitable dimensions and constructed in the usual way. I prefer to provide this drawing board with special guides or tracks 2, 3 and 4 extending along portions of the side edges of the board and along the bottom edge. These guides or tracks can be made out of metal or other suitable material and preferably secured to the board in any suitable way. Each track is provided with a longitudinal groove adapted to receive the downwardly projecting flanges of slide members, such as those illustrated at 5 and 6. One form of track member suitable for the purpose is illustrated in detail in Figs. 2 and 3. This track member comprises two strips of fairly rigid material, such as metal, separated by spacers 7 located at intervals along the edge of the board. Nails or screws 8, or other suitable fastening devices, pass through the two strips and the spacers, serving to fix these parts to the edge of the board. Plates 8a placed and fastened rigidly at intervals along tracks 2, 3 and 4 serve in conjunction with the elements 7 to space apart the stiff members forming the tracks, thus providing grooves of fixed dimensions along the edges of the board. This construction has the advantage of providing a suitable guide for the slide members without so encumbering the edge of the board as to interfere with the use of ordinary T squares and other drafting appliances. Furthermore, dust cannot collect in the grooves so as to interfere with the movement of the slide members; all dust particles fall through between the spacers 7 and plates 8a.

The slide member 5 is rigidly secured to a ruler or indicating member 9 which can be used as a T square in the ordinary manner and also to cooperate with other devices as explained below.

The ruler or indicating member 9 is provided with a plurality of spaced-apart holes or openings 10 near the upper end of this member and this ruler is also provided with a slider 11, one form of which is illustrated in detail in Figs. 12 and 13. The upper side edges of the ruler 9 are preferably beveled as illustrated in Figs. 12 and 13 and the lower edge of the upper end of this ruler is also beveled to facilitate sliding this end of the ruler over other parts of the drafting apparatus, for example, to facilitate the sliding of ruler 16 over ruler 9. The improved slider member 11 is adapted to engage the

ruler 9 only at the side edges and across the lower surface of this ruler. This slide member is preferably made out of flexible material, such as celluloid, or the like, and engages the beveled edges along the sides of the ruler member. The upper surfaces 11' and 11'' of the slider member 11 are substantially flush with the upper surface of the ruler member 9 and, accordingly, offer no obstruction to the draftsman. The surfaces 11' and 11'' are preferably beveled as illustrated to facilitate sliding other parts of the apparatus over the slider member 11. The slider member 11 carries a pivot pin 12 adapted to cooperate with a slotted director member 13 shown in Fig. 1. The pin 12 has an angular or sharp edge as best shown in the enlarged Figure 12. The slider member 11 can be fixed at any adjusted position along the upper end of the ruler member 9, and I have found it convenient to detachably secure the slider member to the ruler by providing the slider member with a projection 13 adapted to register with any one of a plurality of holes or openings 10 in the ruler member. In order to change the position of the slider member with respect to the ruler it is merely necessary to flex the slider member and remove it from the ruler member whereupon it may be again applied to this member with the projection 13' registering with another one of the openings 10 in the ruler.

The guide member 6 cooperating with the track member 4 includes a plate having a slot 15 at right angles to the edge of the board 1, and a slot 17 intersecting the first slot and extending laterally with respect thereto from the point of intersection. A set screw 18 cooperates with the slots 15 and 17 and with the longitudinally extending slot 19 in the ruler member 16. A second set screw 20, carried by the guide member 6, also cooperates with the slot 19 and the ruler 16 and by loosening the two set screws 18 and 20 the ruler member 16 may be placed in any angular position with respect to the guide member 6 and may be held in this position by tightening these set screws. When the set screw 18 occupies the longitudinally extending slot 15 the two set screws 18 and 20 are in a line at right angles to the edge of the board and the ruler 16 may be secured in a position exactly at right angles to the edge of the drawing board. The ruler 16 may be provided with a slider member 21 similar in all respects to the slider member 11 of ruler 9, except for the fact that no projection, such as that shown at 13' on slider 11, is provided on the slider 21. The edges and ends of ruler 16 may be beveled in a manner to correspond with ruler 9 and the position of ruler 16 may be adjusted at will by releasing the set screws 18 and 20. These set screws are preferably located on the bottom of the guide member 6, as best illustrated in Fig. 3 so that the upper surfaces of these set screws may ex-

tend substantially flush with the upper surface of the ruler 16.

The ruler 9 may carry a slider 22 provided with a pin 23 cooperating with clips 24 and 25 engaging vanishing point rulers 26 and 27. These rulers may be held against pins placed at the vanishing points 28 and 29 by means of retaining guide members 30 and 31. The rulers 26 and 27 are preferably identical in construction and therefore interchangeable. They may be provided with slots 32 and 33 and with sectorial openings or holes 34 and 35 adapted to engage pivot pins. The slotted end of ruler 26 is shown in detail in Figures 14, 15 and 16. The pivot pin 12', carried by the slider member 21, has an angular portion adapted to engage the angular portion of the sectorial opening 35, and a curved edge adapted to engage the curved portion of this opening, as best shown in Fig. 16. This provides a hinged connection between ruler 26 and ruler 16, this connection being such that the line defined by the upper edge of ruler 26 always intersects the upper edge of ruler 16 at the point on this line determined by the angular portion of the pivot pin 12'. The ruler 26 may be placed with the slot 33 therein engaging the pivot pin 12' in which event a sliding connection is formed between rulers 26 and 16.

The pin 29 representing one of the vanishing points is preferably carried by a support or bridge 29' arranged above the surface of the drawing board. I prefer to construct this bridge in the form of two strips of material, as best shown in Fig. 18, one strip serving to cover the lower portion of the pivot pin 29 so as to facilitate the movement of the ruler member 16 from a position on the drawing board above the pivot pin 29 to a position below this pin and vice versa. As illustrated in Figure 18 the pin 29 may project through the upper strip and the pin may be provided with a head similar to that of a flat headed tack and this head portion may be disposed between the two strips of material as shown in Figure 18. The pivot pin 29 is thus supported by the lower strip of material and the pin passes through the upper strip forming a part of the bridge 29' and extends above this bridge.

The movable pivot plate 21 on the ruler 16 is normally held in any adjusted position on this ruler by the friction between these parts. For curvilinear perspectives this feature is of value because after the pivot plate or support has once been adjusted with the pivot at a predetermined distance away from the edge of the board, the pivot will not accidentally change position for the ruler 26 cooperating with the pivot is easily slidable and readily moves with respect to the pivot plate.

The pivot pin 12 carried by the slider 11 of ruler 9, cooperates with a longitudinally extending slot 36 in the lower end of the di-

rector member 13. This director member is preferably made out of some transparent material, such as celluloid, and is provided with a pair of parallel lines 37 and 38 scored in the under surface of the member 13, or otherwise applied to this member and located in alignment with the edges of the slot 36. With the parts in the position shown in Fig. 1 the angular edge of pivot pin 12 is in alignment with line 37. By reversing the slider member 11 so as to bring the pivot pin on the righthand side of ruler 9 the angular portion of the pivot pin is brought into alignment with line 38 of the director member 13. The angular portion of pivot pin 12 is in alignment with the adjacent edge of ruler 9 and my invention makes it possible to use either side edge of ruler 9 as a working edge.

The angular position of the director member 13 is controlled by a pair of arms 39 and 40 detachably secured to the director member 13 and engaging pins 41 and 42 secured to the drawing member. These pins may be located on the board in the manner described in my prior Patent No. 1,657,301. The arms 39 and 40 are held in sliding engagement with the pins 41 and 42 by suitable retaining guide members 43 and 44. The arms 39 and 40 are provided with end pieces, a preferred construction of which is best illustrated in Figs. 9 and 10. These end pieces are preferably identical in construction and are provided with central openings 45 and 46 somewhat larger in diameter than the set screw 47 passing through these openings and serving to clamp the arms 39 and 40 to a disc 48. These arm ends are provided with reference lines in alignment with the working edges of the pivot pins 41 and 42 and these lines may be conveniently defined by exposed edges on the arm end, such as those shown at 49, 49', 50 and 50'. These exposed edges may comprise the straight edges of arcuate slots or openings in the arm ends. The central holes 45 and 46 are made large enough so as to permit relative displacement of the arm ends so as to bring the point of intersection of the reference lines, as determined for example by the edges 49, 49', 50 and 50', into alignment with either of the parallel lines 37 and 38 on the director member 13. After the arm ends have been brought into the desired position they may be clamped in place by tightening the set screw 47. In order to establish a more firm connection between the arm ends and the disc 48 I may provide additional set screws 51 and 52 cooperating with arcuate slots 53 and 54 in the disc 48 and with slots 53' and 54' in the arm ends. A set screw 47 serves to clamp the disc 48 firmly against the upper surface of the director member 13 and additional clamping means in the form of a set screw 55 may also be provided cooperating

with the disc 48 and with slot 36 in the director member 13.

In the event the director member 13 is found to be of insufficient length for making a certain perspective drawing, or that the edge of the same is to be used as a reference line instead of either of lines 37 and 38, an extension piece 56 may be employed as illustrated in Fig. 4. This extension piece may be provided with set screws 57 cooperating with the slot 36 in director member 13 and may be provided with a slot 58 located in alignment with one edge of the director member 13 and cooperating with the pin 12 on the slider member 11 carried by ruler 9. The control arms 39 and 40 may be connected to the extension piece 56, or they may be connected to the upper end of the director member 13, (as shown in dotted lines in Fig. 1) a plurality of holes 59 being provided in the upper end of the director member 13 for receiving the set screws 47 and 55. Additional holes 60 are provided along the other edge of the director member 13 so as to permit connection of the arms 39 and 40 to this edge of the director member when desired. The arms 39 and 40 may be connected to the upper end of member 13 with their intersecting reference lines in alignment with either of the parallel lines 37 and 38 by utilizing the centrally located holes 61, as shown in dotted lines in Fig. 1.

In making a perspective drawing with the use of my improved apparatus, I follow the usual procedure according to which a plan view of the object, such as that represented at A, is arranged near the upper margin of the drawing board, and an elevation, such as that illustrated at B, is arranged near one side of the board. A line *a* representing the picture plane is arbitrarily chosen and the vanishing points *b* and *c* are determined in the usual way by drawing lines *d* and *e* from a vanishing point *f* parallel with the adjacent side edges of the plan view A until these lines intersect the picture plane and then dropping perpendiculars from these intersections to line *g* arbitrarily chosen to represent the line of elevation of the observer's eye. The perspective height of any vertical edge of the object is ordinarily determined by drawing a line, such as that indicated at *h*, coinciding with an adjacent edge of the object and intersecting the picture plane line *a*, then drawing a vertical line, such as *i*, intersecting a horizontal line (not shown) passing through the top of the vertical edge in question on the elevation of the object B. From the intersection of the two last mentioned lines a line is drawn to the vanishing point *b*. The desired perspective height is indicated by the intersection of this line with a vertical line drawn to represent the edge in question. The position of this vertical line is determined by drawing a line from

the given edge in the plan view toward the observation point until it intersects the line *a*. The vertical line passing through this intersection is the desired line representing the edge in question.

By using my improved apparatus, it is possible to avoid drawing many of the lines above mentioned which must be drawn in order to make a perspective without the aid of such an appliance. The ruler 16 cooperates with the elevation of the object so as to make it unnecessary to draw any horizontal lines through this elevation figure, and the rulers 26 and 27, which pivot about the vanishing points *b* and *c*, cooperate with the elevation ruler and make it possible to at once draw in the lines representing horizontal edges of the object.

My invention is suitable for making not only lineal perspectives as illustrated in Fig. 1, but it is also well adapted to the making of curvilinear perspectives using a cylindrical picture plane. With this object in view I prefer to provide the director member 13 with a plurality of sectorial holes 62 in the upper end of this member and with holes 63 in the lower end of this member, these holes being substantially in alignment with the lines 37 and 38 on member 13. In Fig. 5 I have shown the director member 13 in an inverted position with one of the holes 63 engaging a pivot pin 64 located near the upper margin of the drawing board. The corresponding sectorial hole 62 of the member 13 engages the pivot pin 12, carried by a slider member 11a on ruler 9. The slider member 11a may be identical in construction with that shown at 11 in Fig. 1, except for the fact that it is freely movable along member 9, and is preferably in the form of a band engaging the edges of the ruler and the upper and lower surfaces of the same, as illustrated in Fig. 7. It will be understood that as the director member 13 is swung about the pivot pin 64, the pivot pin 12 on the slider member 11a moves in the arc of a circle, this arc comprising the cylindrical picture plane.

My invention is also suitable for making curvilinear perspectives employing a cylindrical picture plane having its convex side toward the top of the drawing board instead of toward the bottom as shown in Fig. 5 and for this purpose it will be understood that it is only necessary to locate the pivot pin 64 at a point below the picture plane, covered by means of any suitable pin supporting member.

My invention can be used for the purpose of making enlargements or reductions of drawings. For such pantographic work it is merely necessary to place the director member 13 with one of the holes 63 (or corresponding holes 63' in the other end of the director member) engaging the pivot pin located at a convenient point on the drawing

board and either fixed directly to the drawing board, or on a suitable elevated support. The slot 36 in the director member 13 co-operates with the pin 12, carried by slider member 11, as described in connection with Fig. 1 and by merely moving the ruler member 9 from side to side the director member is caused to indicate the desired points on the enlarged drawing, or on the reduced drawing as the case may be. The holes 63 and 63' may also be used in engagement with pivot pins located above or below the picture plane (as the case may be) for making linear perspectives.

My improved drafting appliance makes it possible to make linear, relief, theatrical, radial and curvilinear perspective drawings with a minimum of effort and in a very short time and it is also admirably suited to precise and quick pantographic work, eliminating the necessity of employing the complicated pantographs heretofore used. The several rulers and other members cooperating therewith may be passed over one another without any difficulty because the ruler members have their edges and ends beveled. Furthermore, the director member by having its lower edges beveled readily passes over any thumb tacks, or other objects, which would ordinarily interfere with the freedom of movement of this member over the surface of the drafting member. The several mechanical connections between various parts of the apparatus are efficient and do not involve complicated or expensive parts.

It is to be understood that my invention is not limited to the details of construction of the preferred embodiment herein described in detail but includes such modifications thereof as fall within the scope of the appended claims.

I claim:—

1. The combination with a drawing board of a ruler, means fixed thereto for guiding the ruler along one edge of the board, a pivot pin, a directing member engaging said pin, a movable support for said pin, and means for securing said support to said ruler in an adjusted position.

2. The combination with a drawing board of a ruler having a plurality of spaced apart openings therein, means fixed to said ruler for guiding the same along one edge of the board, a pivot pin, a directing member engaging said pin, a movable support for said pin, and a projection carried by said support adapted to register with any one of the openings in said ruler.

3. The combination of a ruler having beveled edges, and a plurality of spaced apart openings therein, a flexible slider member for said ruler engaging the same only at the edges and lower surface thereof, the upper surfaces of said member being

substantially flush with the upper surface of said ruler, a projection supported by said member and adapted to register with any one of the openings in said ruler, a pin carried by said member and a second ruler engaging said pin.

4. The combination of a ruler, a slider member therefor, a pivot pin carried by said slider member, and a second ruler engaging said pivot pin, said pin having a vertical edge in line with one edge of one of said rulers.

5. The combination with a drawing board of a ruler having the upper side edges thereof beveled, means for guiding said ruler along one edge of the board, a director member, and means for interconnecting the director member and said ruler, said director member having the lower side edges thereof beveled.

6. The combination of a ruler having a sectorial opening therein, a pivot pin, and a second ruler carrying said pin, said pin having an angular portion engaging the angular side of said opening and a curved portion engaging the curved side of said opening.

7. A perspective drafting appliance comprising the combination with a drawing board for supporting a plan view and a perspective view, of a ruler movable over the perspective view, a transparent directing member movable over the plan view, and having a longitudinally extending slot in the lower end thereof and a pair of parallel lines in alignment with the edges of said slot, and means cooperating with the slot in said directing member for connecting the same to said ruler.

8. A perspective drafting appliance comprising the combination with a drawing board for supporting a plan view and a perspective view, of a ruler movable over the perspective view, a transparent directing member movable over the plan view, and having a longitudinally extending slot in the lower end thereof and a pair of parallel lines in alignment with the edges of said slot, means for guiding the directing member, and means cooperating with the slot in said directing member for connecting the same to said guiding means and to said ruler, said directing member having a plurality of holes near the upper end thereof to permit selective attachment of the guiding means to said member near the upper end thereof.

9. The combination of a ruler having a sectorial opening therein, a pivot pin having an angular portion engaging the straight side of said opening and a curved portion engaging the curved side of said opening.

10. A perspective drafting appliance comprising the combination with a drawing board for supporting a plan view and a perspective view, of a ruler member movable over the plan view, and having a longitudinally extending slot in the lower end thereof, a pair of guiding arms adjustably secured

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to said member, a pair of pins fixed with respect to said board, and means for holding said arms in contact with said pins, said arms having reference lines extending across the slot in said member, each of said lines being
5 in alignment with one of said pins.

11. A perspective drafting appliance comprising the combination with a drawing board for supporting a plan view and a perspective view, of a ruler member movable
10 over the plan view, and having a longitudinally extending slot in the lower end thereof, a pair of guiding arms adjustably secured to said member, a pair of pins fixed with respect to said board, and means for holding
15 said arms in contact with said pins, said arms having exposed intersecting edges extending across the slot of said member, each of said edges being in alignment with one of said pins.

12. The combination with a drawing board of a bridge member arranged on the surface of the drawing board, said bridge member comprising two superimposed strips of material, a pivot pin passing through one of said
20 strips, and a member movable along the surface of said bridge member and below the same, said movable member being maintained out of contact with said pivot pin by one of the strips of said bridge member.
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30 In testimony whereof I affix my signature.

THEODORE A. DE POSTELS.

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