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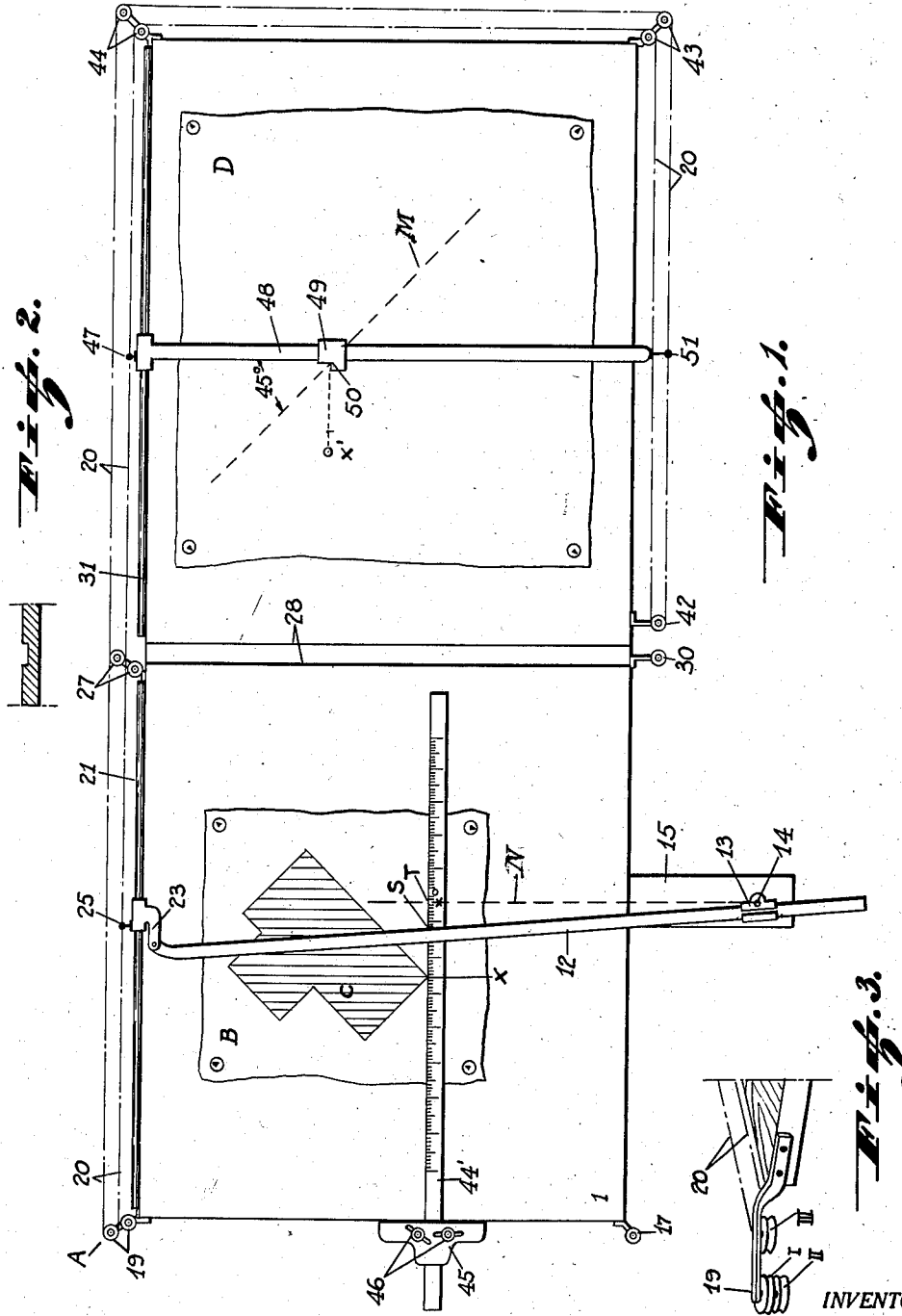
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1,986,625

PERSPECTIVE DRAWING DEVICE

Filed Aug. 19, 1931

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

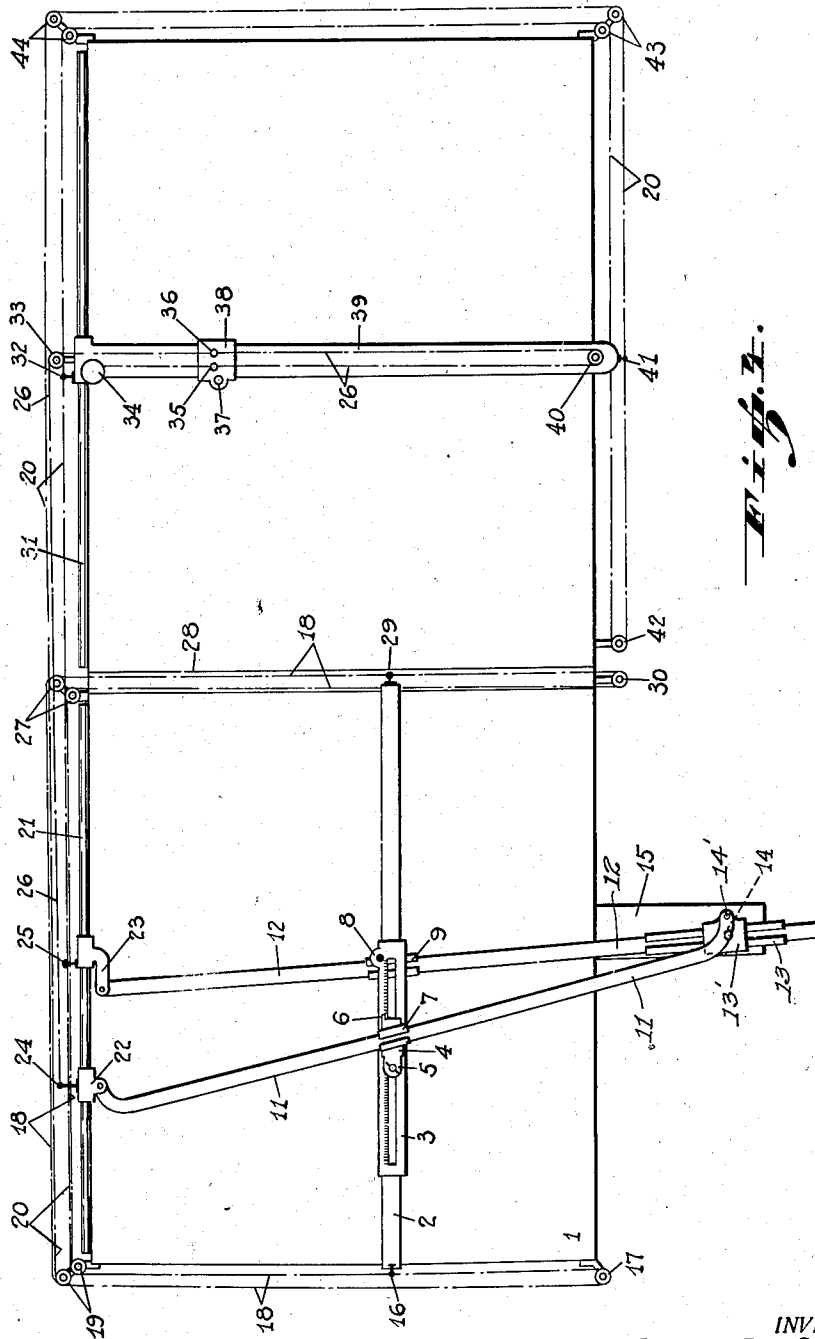


Fig. 2.

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4 Sheets-Sheet 3

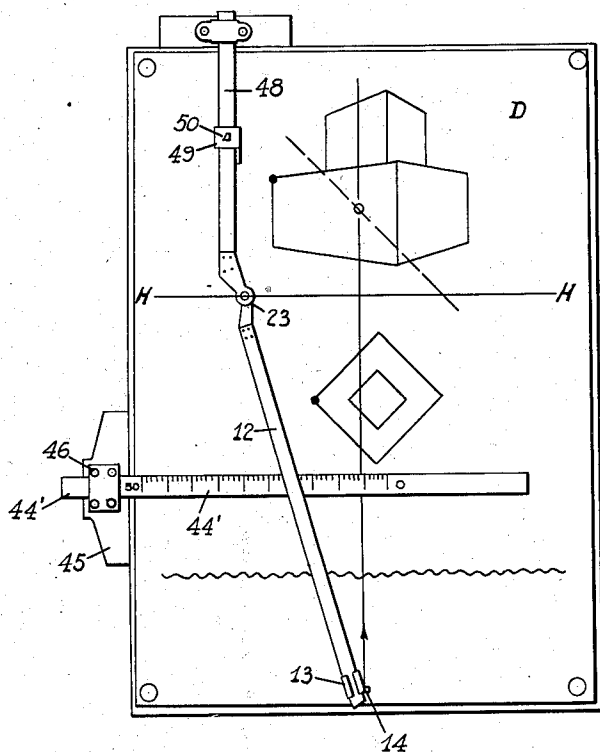
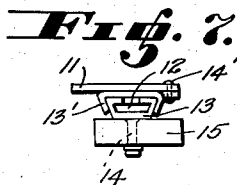


Fig. 5.



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UNITED STATES PATENT OFFICE

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PERSPECTIVE DRAWING DEVICE

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3 Claims. (Cl. 33—77)

My invention relates to apparatus for making perspective drawings and has for its particular object to produce an apparatus of this type which is easily handled and permits even the unskilled draftsman to produce correct perspective drawings.

For a complete understanding of my invention, I refer to the annexed drawings, on which I have shown, by way of illustration, some embodiments of the apparatus and on which

Fig. 1 is an elevation of an apparatus for drawing perspectives by dots,

Fig. 2 a detail sectional view showing the opening made in the board for the passing of the cords used to cause parallel movement of one of the rulers used in the apparatus,

Fig. 3 a detail view showing in perspective the pulleys for the cords,

Fig. 4 a view similar to Fig. 1 showing a modified apparatus for drawing perspectives pantographically.

Figs. 5 and 6 are views similar to Fig. 1, showing further modifications, and

Figure 7 is a detail sectional view showing the sliding connections between the rulers and the drawing board of the Figure 4 construction.

In all the figures of the drawings I have used the same reference numerals to indicate the same or corresponding parts.

In Fig. 1 there is shown at 12 a ruler, suitably connected to the drawing board 1, for which purpose the ruler is provided with a slide 13, which at 14 is pivoted to an extension 15 of the board. The extension 15 may consist simply of a narrow strip fastened to the drawing board.

The other end of the ruler 12 is pivoted to a slide-member 23, which moves along a guide rail 21 fixed along the top edge of the drawing board.

On the other half of the board is provided a ruler 48, which can be moved parallel to itself, for which purpose its upper end is made to move on a guide rail 31, also provided at the upper edge of the drawing board 1.

On ruler 48 is placed a slide-piece 49, provided with a pointer 50. The essential characteristic of ruler 48 is that its parallel movements are invariably the same as those of slide-member 23. As shown on the drawings, there are provided several pairs of pulleys 19, 44, 43 and 42, over which passes a cord 20, connected with the slide-member 23 and to the two ends of the ruler 48. The pairs of pulleys 44 and 43, are each placed in the same plane on the same bracket, while the pulleys 19 are disposed in different

planes as shown by Fig. 3, the cord 20 passing over the pulleys on the lower plane.

The path of cord 20 can be clearly seen from Fig. 1. As shown in Fig. 1, there is also provided a ruler 44' having a graduated scale progressively increasing from zero in both directions. Ruler 44' always moves horizontally, being held by the slide-piece 45, movable along one of the edges of the drawing board 1. Ruler 44' is secured in said slide-piece 45 by means of screws 46.

In the apparatus shown in Fig. 4 adapted for drawing perspectives pantographically, there is also provided a ruler 12, similar to the one shown in Fig. 1 and which carries a slide 9, pivoted at 8 to a scale 3, movable relative to the ruler shown at 2. The latter can be moved parallel to itself and horizontally, for instance, by means of a cord 18 passing over a set of pulleys 17, 19, 27 and 30, and which cord, by means of rods 16 and 29, is secured to the ends of ruler 2.

The pulleys 17 and 19 are placed above the drawing board, the cord 18 passing over them, moving inside the vertical groove 28 in the center of the board.

On the scale 3 is movably placed a part 4, provided with a pointer 6, which, by means of a screw 5, can be placed at the required point of the scale. On said part 4 is pivoted a slide member 7, inside of which can move another ruler 11, whose lower end is pivotally connected at 14' with a slide 13' slidably engaging the slide 13.

The upper end of ruler 11 is pivotally connected with slide-piece 22, which together with a similar slide-piece 23 runs along a guide rail 21 provided along the upper edge of the drawing board 1.

On the other half of the drawing board 1, is placed a vertical ruler 39, which always moves parallel to itself, and, like the ruler 48 in Fig. 1, is so disposed, that the movements are invariably identical to those of slide-piece 23, their action being guided by rail 31, also provided along the upper edge of the drawing board 1.

Ruler 39 is also provided with a slide-piece 38, to which is adjusted a pencil holder, 37. Slide-piece 38 is so placed that it may be automatically moved upwards or downwards relative to a given point along ruler 39, and to the same extent as the relative movement of rods shown at 24 and 25. This characteristic feature, essential to the function of the apparatus, is obtained by the placing at the ends of the ruler 39 pulleys 33 and 40, over which passes a cord 26, which at one of its ends, is joined to rod 24 of slide-piece 22, and

at its other end is wound up on a spring-controlled drum 34, which keeps the cord always taut. On slide-piece 38 are placed two pressure gabs 35, 36 which are selectively operable to connect said slide-piece with the respective reaches of the cord 26 for upward movement with the upwardly movable reach or downward movement with the downwardly movable reach.

To the upper end of the ruler 39 is fastened a rod 32, similar to rod 47 in Fig. 1, to which rod is connected cord 20, used for the parallel movements of ruler 39. As has already been stated, this means for the movement of the sliding-piece 38 and the rulers 39 and 48 may be different from the usually employed means without in any way affecting the invention, since such means does not constitute the fundamental characteristics of this system, but is merely an accessory, which can be replaced by any other means.

The apparatus is used as follows:

If a perspective is to be indicated by dots, then the apparatus shown in Fig. 1 is used. In this case, one places on the left hand side of the drawing board 1, the paper marked B containing a plan view of the building or the like to be shown in perspective. On the right hand side of the board is placed a sheet marked D, on which the perspective shall be drawn. Thereupon, the pointer 50 is placed at the view point chosen while the ruler 44', by means of the slide-piece 45, is adjusted and secured by the screws 46, in such a manner that the zero mark of the graduated scale on the ruler aligns with the vertical line N.

When this has been done, one draws on sheet D a straight line M, at 45° and at such a position that when ruler 12 is moved over zero of the scale on ruler 44', the pointer 50 of piece 49 marks on line M the height at which one requires to mark on sheet D the horizon line.

To fix a point, such as that indicated by letter "x" of the drawings, one proceeds as follows: The ruler 44' is moved upwards, until it aligns with the point mentioned above, and then the ruler 12 is moved either to the left or to the right of the zero mark on the graduated scale 44' until it intersects on scale 44' the height or the depth of the objective point above or below the horizon. Once the ruler 12 has been moved to said position, slide-piece 49 is moved to a position such that its pointer 50 meets the straight line M at 45°, whereupon the ruler 12 is moved, until it aligns with point "x", in which position the pointer 50 will indicate X' in the required perspective. After the different characteristic points have once been fixed, they are joined systematically by straight lines, together denoting the entire perspective.

When a perspective is to be drawn pantographically, the apparatus shown in Fig. 4 is used, in which figure for greater clearness, the sheets of paper B and D shown in Fig. 1, have been omitted.

To commence work with this apparatus, one first places the pointer 6 at the zero mark on the graduated scale of slide-piece 3, at which position it is fixed by means of screw 5. Then, after loosening the pressure gabs 35 and 36 one moves the slide-piece 38 until the pencil holder 37 coincides with the height of the horizon selected. When this has been done and the pressure gabs again have been tightened the ruler 12 is moved and the pencil in holder 37 will then sketch the line of the horizon, as required for the object in

view. Thereafter the pressure gabs 35, 36 are selectively loosened and tightened to connect the slide-piece 38 with one or the other of the reaches of the cord 26 for upward or downward movement of said slide-piece according to the direction of swinging movement of the ruler 11.

If one wishes to fix the view-point of a perspective under the level of the horizon, then one must adopt the same proceeding as that described in the foregoing paragraph, but screw 35 instead of 36 is tightened. In both cases, in order to determine the perspective of any plan, one merely has to place the pointer 6 at the number of the graduated scale 3, corresponding to the plan in question, at its height above or below the horizon, and having in view the plan already drawn, the pencil in holder 37 will draw the perspective height in question.

Once the perspectives of all the plans have been made, then it is only requisite to join them by vertical lines, which can be drawn by the apparatus, since it is only necessary to place the slide 9 at the point of the plan to which said vertical corresponds and move the pointer 6 from one to the other of the points of the graduated scale, until it reaches the graduation corresponding to the extreme heights of the verticals, making the necessary changes of the pressure gabs 35 and 36, where the verticals cross the horizon plane.

My system may also be advantageously used for preparing plans for parks and gardens, and where necessary to establish perspectives of roads or paths, or for the arrangement of flower beds.

Groups of trees can also be easily sketched, for in each case, it is only necessary to adjust the slide 9 at the place of each tree and move the pointer 6 to a number corresponding to the height of the tree. The top of a tree can be easily defined by the pointer 6 being placed at diverse heights.

Finally, in the case of inclined straight lines, their perspective can be drawn proportionally, after slight practise has been acquired in the use of the apparatus. In that case, slide 9 must be moved along the said straight line, pointer 6 being moved simultaneously and proportionally, so that from the end of said straight line, with its height relative to the horizon, it reaches the other extreme, with the height corresponding thereto.

In any case, if it is not desired to adopt this method, one can also determine the extreme points and connect them to each other, and this proceeding is also applicable to curves, not on the horizontal plane.

Figs. 5 and 6 illustrate other modifications of simpler apparatus. According to the arrangement illustrated in Fig. 5 an element 13 is pivoted as at 14 to the drawing board near the bottom thereof and has slidably engaged therein the lower end portion of the ruler 12, which ruler, at its upper end, is pivoted, as at 23, to the lower end of a vertically disposed ruler element 48 having adjustable therealong a slide-piece 49 provided with a marking element 50, said ruler element 48 being slidably engaged at its upper end with a suitable element which is slidably engaged with the top of the drawing board whereby said element 48 is maintained in a vertical position as it is shifted from side to side of the board. A horizontal ruler 44' is longitudinally adjustable in a head 45 engaged with the left hand side of the drawing board and is adapted to be secured in any longitudinally ad-

justed position by suitable clamp means 46, said ruler having graduations as shown. In the use of this form of the device one proceeds as outlined in connection with the forms of the invention illustrated in Figs. 1 and 4. The sheet D containing the plan to be drawn in perspective is fastened on the drawing board and above the plan is marked the working horizon line H—H corresponding to the horizon line H'—H' of the perspective to be drawn. The ruler 12 is swung through angles according to dimensions of the plan and according to correspondingly indicated distances on the scale of the ruler 44'. Thereby the element 48 is shifted laterally and vertically and by means of the marking element 50 points are located corresponding to points of the plan, after which the located points are connected to produce the perspective.

According to the form of the invention illustrated in Fig. 6, the drawing board 1 has fastened thereto a vertically disposed guide rail 31 on which is slidably mounted for vertical adjustment a horizontally disposed ruler 39. The ruler 12 is substantially horizontally disposed in this instance and is pivoted at its left hand end to the arm 39 and is provided near its right hand end with a slide piece 13 to which is pivoted the adjacent end of the arm 11 which also is substantially horizontally disposed. The arm 11 near its left hand end is slidably engaged in a slide-piece 15 which is pivoted, as at 15, to a block 14 which is slidable along the rail 31, while intermediate its ends said arm 11 has slidably engaged therewith a slide piece 7 which is pivoted to a slide-piece 4 which, in turn, is adjustable along a scale element 6 and adapted to be secured in any desired position of adjustment relative thereto by a screw 5. The scale element 6 is slidable along a vertically disposed bar 10 and is pivotally and slidably connected with the ruler 12 as indicated at 8. Cords 20 extend over guide pulleys 19, 44, 17, 43 at the top and the bottom of the board, respectively, and are connected with the ends of the bar 10 whereby the latter is maintained vertically disposed as it is shifted horizontally across the board. On the ruler 39 is slidably mounted a slide-piece 38 carrying a marking element 37, while connected with said slide-piece 38, as at 36, is a cord 26, one portion of which extends from its connection 36 over a pulley 40 at the left hand end of the ruler 39, inwardly over a pulley at the pivotal connection of the ruler 12 with the ruler 39 and downwardly, as at 23, to the slide-piece 14 with which it is connected, while its other portion extends over a pulley 33 at the right hand end of the ruler 39 and is suitably fastened. Thus, the slide-piece 38 is moved along the ruler 39 predetermined amounts in response to movements of the ruler 39 and the slide-piece 14 along the rail 31. The essence of this form of the invention as distinguished from the form of the invention illustrated in Fig. 4 is that the parts are more compactly arranged and are, considered as an entirety, shifted, in effect, from vertical and horizontal positions in Fig. 4 to horizontal and vertical positions in Fig. 6. In other respects the arrangement of Fig. 6 is generally the same and has the same general mode of operation as set forth in connection with the Fig. 4 form of the invention.

Of course, various modifications might be introduced in the construction of this apparatus,

without a departure from the gist of the invention herein involved.

I claim:

1. An apparatus for drawing perspectives from plans comprising, in combination, a drawing board, a ruler provided with a scale and mounted for sidewise movement in parallelism with itself over the board, a slide-piece pivoted to the board, a second ruler slidably engaged at one end in said slide-piece and extending across said first mentioned ruler, a guide rail fixed to the board, a second slide-piece slidably engaged with said rail, a pivotal connection between said second mentioned slide-piece and the other end of said second mentioned ruler, a second guide rail, a third ruler disposed at substantially right angles to said first mentioned ruler and slidably engaged with said second guide rail for sidewise movement in parallelism with itself over the board, a slide-piece mounted on said third ruler for movement therealong, a marking element carried by said last mentioned slide-piece, rollers carried by the board, and an endless flexible element extending over said rollers and connected with said second mentioned slide-piece and also connected with the ends of said third ruler whereby angular movements of the second mentioned ruler produce sidewise movements of said third ruler.

2. An apparatus for drawing perspectives from plans comprising, in combination, a drawing board, a ruler mounted for sidewise movement in parallelism with itself over the board, a scale piece mounted on said ruler for movement therealong, a slide-piece pivoted to the board, a second ruler slidably engaged at one end in said slide-piece and extending across said first mentioned ruler, a guide rail fixed to the board, a second slide-piece slidably engaged with said rail, a pivotal connection between said second mentioned slide-piece and the other end of said second mentioned ruler, a third slide-piece slidably mounted on said second mentioned ruler, a pivotal connection between said third slide-piece and said scale piece, a pointer element slidably adjustable along said scale piece, a fourth slide-piece pivoted to said pointer element, a third ruler slidable through said fourth slide-piece and pivoted at one end to the first mentioned slide-piece, a fifth slide-piece slidable on said rail, a pivotal connection between said fifth slide-piece and the other end of said third ruler, a fourth ruler disposed at substantially right angles to said first mentioned ruler, a second guide rail on which said fourth ruler is mounted for sidewise movement, a sixth slide-piece slidable along said fourth ruler, a marking element carried by said sixth slide-piece, a connection between said second slide-piece and said fourth ruler whereby angular movements of the second ruler impart sidewise movements to the fourth ruler, and a connection between said fifth and sixth slide-pieces whereby angular movements of the third ruler produce movements of said sixth slide-piece along said fourth ruler.

3. The combination as set forth in claim 2 in which rollers are carried by the drawing board, and in which the connection between the second slide-piece and the fourth ruler and between the fifth and sixth slide-pieces comprise endless flexible elements extending over said rollers.

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