Sept. 5, 1961 B. W. HANCOX 2,998,654

MECHANICAL PERSPECTIVE DEVICE AND KIT

Filed Jan. 14, 1955 3 Sheets-Sheet 1

FIG. 1.

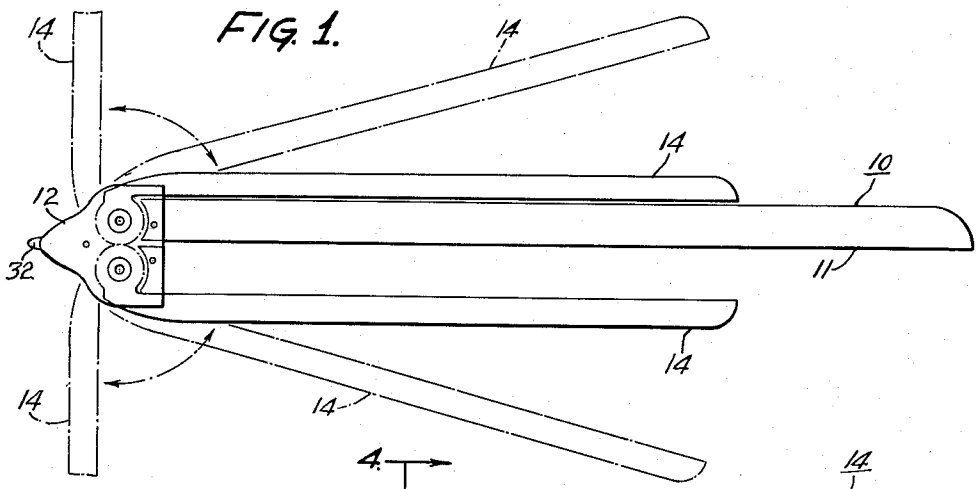


FIG. 2.

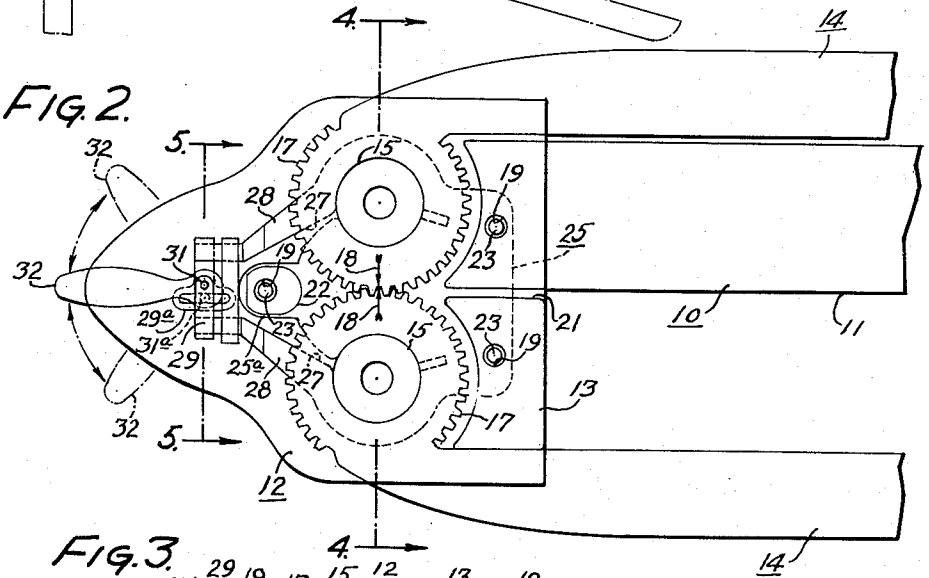


FIG. 3.

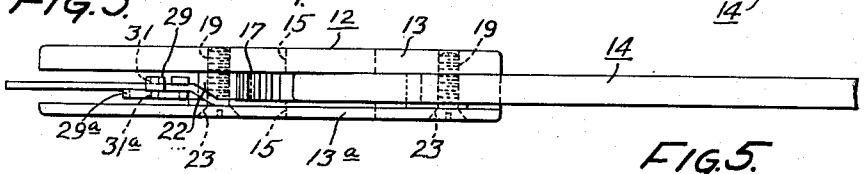


FIG. 4.

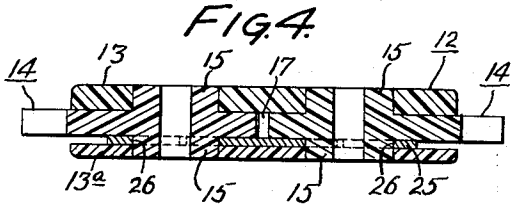
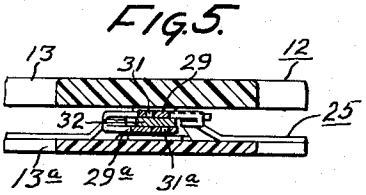


FIG. 5.



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FIG. 7.

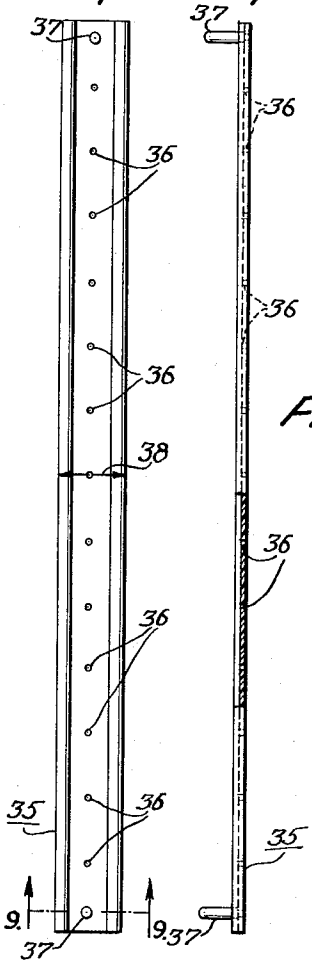


FIG. 8.

FIG. 6.

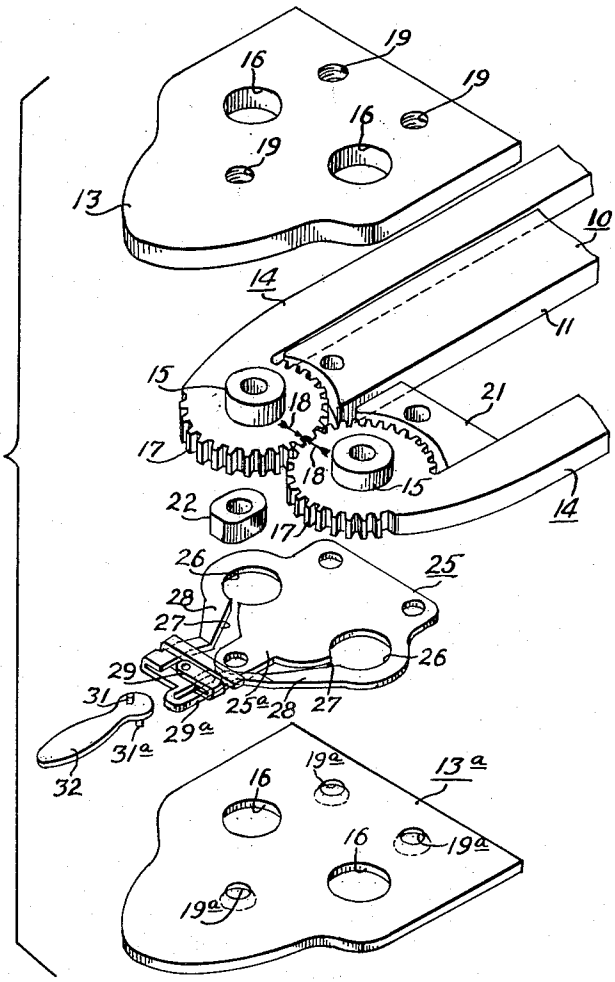


FIG. 9.

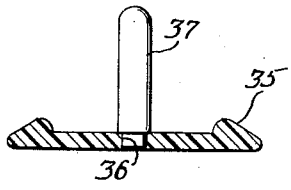


FIG. 10.

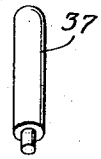
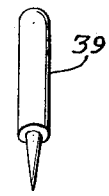


FIG. 11.



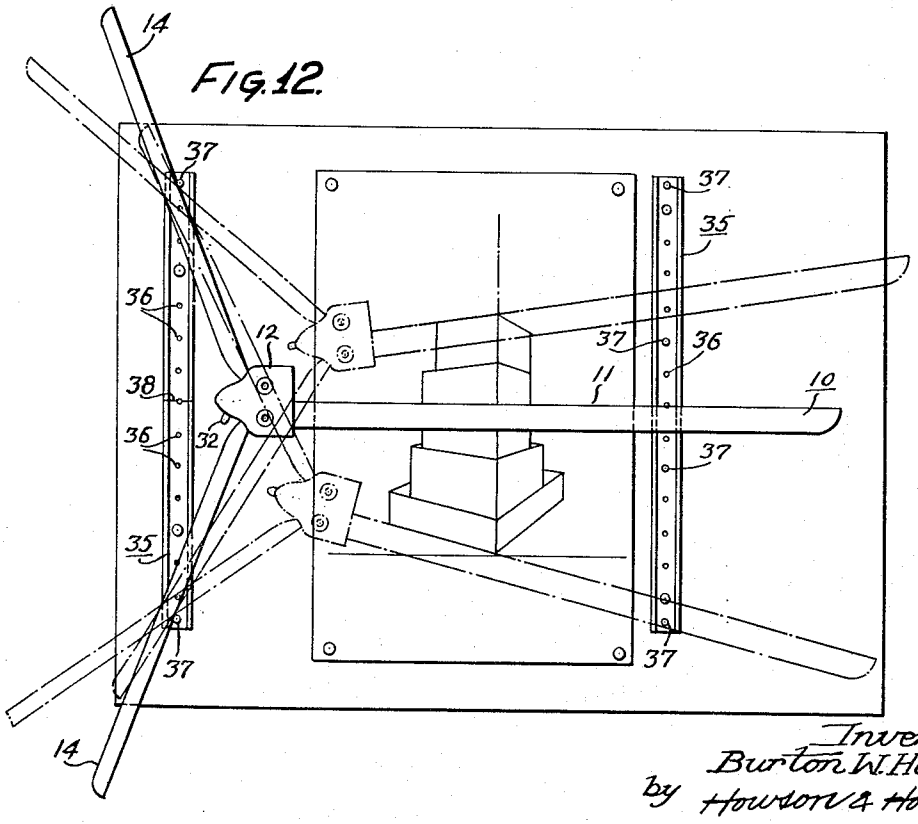
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MECHANICAL PERSPECTIVE DEVICE AND KIT

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FIG. 12.



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2,998,654

MECHANICAL PERSPECTIVE DEVICE AND KIT

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Filed Jan. 14, 1955, Ser. No. 481,794
4 Claims. (Cl. 33—77)

The present invention relates to a mechanical perspective device for use by draftsmen in laying out perspective drawings.

A primary object of the present invention is to provide a device of the stated character which is possessed of a wider range of adjustability than the prior art devices.

Another object of the present invention is to provide a perspective device which is susceptible to use at either side of the drawing board.

A further object of the present invention is to provide a perspective device embodying a novel lock mechanism which is fully effective in operation and use.

Still another object is to provide an improved perspective device which is simply manufactured, foolproof in operation, and is resistant to functional deterioration.

These and other objects of the invention and the various features and details of the construction and operation thereof are more fully set forth hereinafter with reference to the accompanying drawings in which:

FIG. 1 is an inverted plan view of a device made in accordance with the present invention.

FIG. 2 is an enlarged fragmentary view similar to FIG. 1 showing the detail of the construction of the device.

FIG. 3 is a side elevational view of the device.

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 2.

FIG. 5 is an enlarged sectional view taken on the line 5—5 of FIG. 2.

FIG. 6 is an exploded perspective view illustrating the elements which make up the device according to the present invention.

FIG. 7 is a plan view of an auxiliary device used with a device made in accordance with the present invention.

FIG. 8 is a side elevational view of the device illustrated in FIG. 7.

FIG. 9 is an enlarged sectional view taken on the line 9—9 of FIG. 7.

FIGS. 10 and 11 are perspective views of stop elements employed with the device shown in FIG. 7.

FIG. 12 is a plan view showing the device in operation.

Referring now to the drawings the perspective device comprises a blade 10 having at one edge 11 a straightedge which is employed to draw the lines of the perspective in the drawing. The blade 10 is fixedly mounted in an end casing 12 which, as shown, is flat on both faces. By providing flat faces on opposite face plates 13, 13*a* of the casing 12 the device may be used with guide elements at either the left hand side of the drawing (as shown in FIG. 13) or on the right hand side of the drawing. This is very important and very convenient when drawing with a 45° perspective in which the perspective lines at the opposite sides of the center line of the drawing vanish at points equally spaced from the center line and the line of sight.

To obtain the proper angularity of the perspective lines the blade 10 and the casing 12 have mounted for relative rotation relative thereto a pair of arms 14, 14. As shown in FIG. 6 the arms 14 are each provided with stub shafts 15 which are journalled in apertures 16 in the opposite face plates 13, 13*a* of the casing 12.

Means is provided to position the arms 14, 14 at equal angles with the straight edge 11 of the blade 10. To this end the arms are provided at their interior extremity with gear teeth 17 which mesh with one another and effect equal angular movement of the arm away from the straight edge 11. As shown in FIG. 6, the teeth are provided with index marks at 18 to facilitate proper assembly of the device. To maintain free angular movement of the arm in the casing 12 the face plates 13, 13*a* of the casing are maintained in spaced parallel relation by spacer blocks 21 and 22. The plates 13 and 13*a* are secured in spaced relation by bolts 23 which pass through the blade 10, and the spacer blocks 21 and 22 and are threadedly engaged at 19 in the bottom plate 13. The corresponding apertures in the opposite plate 13*a* are recessed as indicated at 19*a* in FIG. 6 to receive the beveled head of the bolts 23. Thus the outer faces of the plates 13 and 13*a* are perfectly smooth to lie flush against the drawing board.

In accordance with the invention the casing 12 contains a locking device to lock the arms 14, 14 in proper angular position. To this end a trifurcated locking plate 25 is mounted intermediate the gear portions of the arms 14, 14 and the upper wall 13*a* of the casing 12. As shown the plate 25 is provided with apertures 26, 26 which snugly receive the stub shafts 15 of the arms 14, 14, 14. The plate is split as indicated at 27, 27 to provide projecting legs 28, 28 at opposite sides of the central portion 25*a*. By displacing the legs 28, 28 inwardly toward the central portion 25*a*, the apertures 26 are reduced in diameter to securely clamp around the stub shafts 15 and lock the arms 14, 14 against angular displacement in the casing 12. The free extremities of the legs 28, 28 have lugs 29 and 29*a* which project inwardly beyond the outer line of the casing. The lug 29 is provided with an aperture, and the lug 29*a* is provided with an elongated slot. The aperture and the slot mount eccentric pins 31, 31*a* projecting from the opposite sides of a locking lever 32. Thus when assembled, the lugs 29, 29*a* mount the locking lever 32 wholly within the casing 12.

As shown in FIG. 2 the locking lever 32 projects outwardly for manual actuation. When the lever 32 is disposed parallel to the blade 10, the pins 31, 31*a* are laterally spaced to position the pins in their inner limit position to clamp the arms in adjusted position. When the lever 32 is displaced to its broken line position, however, the pins are brought into alignment with the straight edge 11 causing the legs 28, 28 to be displaced outwardly and release the arms 14, 14 for adjustment. It should be noted that the locking lever 32 is contained wholly within the casing 12 except for the tip of the lever 32 which projects outwardly beyond the end of the casing. Thus the locking device of the present invention does not interrupt the flat surfaces on the exposed faces of the plates 13, 13*a* and does not interfere with reversal of the position from the left hand side to the right hand side of the drawing.

In accordance with another feature of the invention, the guide elements for the perspective device are readily mountable and demountable from the drawing board. To this end the guide elements are mounted in a guide bar 35. The bar 35 is channel shaped as indicated in FIG. 9 and is adapted to be secured in proper position on the board by thumb tacks, masking tape, or the like. The member 35 is provided with a series of apertures 36 which are adapted to mount guide pins 37.

It should be noted that the channel formation of the guide bar 35 permits the use of thumb tacks passing through selected holes of the series 36. The head of the thumb tack will seat within the channel of the bar 35 and therefore will not interfere with the movement of the perspective device on the guide bar. In the present instance the guide pins 37 are fixedly and permanently

mounted in the end apertures of the guide bar, and demountable pins are provided for insertion in other apertures of the series 36.

The apertures 36 are arranged at equally spaced intervals from the center line 38 of the element 35. The center line 38 is provided with suitable indicia to insure that it is aligned with the line of sight of the drawing. Thus the element 35 insures that the guide pins 37 are equally spaced from the line of sight by providing a simple expedient for mounting the guide pin on the board. In the prior devices of this character, the guide pins or studs were mounted directly on the board and to change the position of the studs it was necessary to accurately calibrate their position relative to a vertical line and the line of sight. By providing the guide bar 35, it is a simple procedure to position the bar 35 in proper vertical position with the center line at the line of sight, and then if the position of the guide pins 37 must be changed, additional pins may be simply mounted in corresponding apertures at the opposite sides of the center line 38. After the pins are in position, of course, it is necessary to adjust the angularity of the arms 14, 14. However, this is an extremely simple operation as will be set forth in detail below.

Preferably the blade 10 and its associated structures will be marketed in a kit containing the blade, and two guide bars 35 with a number of pins 37. Thus a guide bar 35 may be mounted at each side of the drawing to obviate the necessity for shifting the elements from one side of the drawing to another. In addition to these elements pointed guide pins 39 will be provided with the kit. The pointed guide pins as shown in FIG. 11 are adapted to pass through the apertures 36 in the guide element 35 to engage in the drawing board. It may be found desirable to remove the guide bar 35 from the drawing board in order to draw in the space which the bar 35 occupies. When this is necessary the pointed pins 39 are employed. However, the present invention greatly simplifies the proper positioning of the pins. To this end the guide element is removed after marking its location with pins 39 or similar device to obviate the necessity of readjusting the arms 14, 14 when the space is no longer required. The element 35 is then shifted along the center line to a new position and oriented parallel to the vertical lines of the drawing. With the element 35 in place the pins 39 are projected through the apertures 36 in the element to mark their position on the drawing board. Of course, corresponding apertures on the opposite side of the center line 38 must be employed. The element may then be removed and the pins 39 located in the apertures provided by the previous marking.

In the operation of the device the drawing is set on the drawing board with a horizontal sight line and a vertical center line. The guide bar is mounted with its center line 38 overlying the sight line of the drawing, and parallel to the vertical center line of the drawing. A perspective angle is chosen either in accordance with a predetermined setting, as for example when copying photoprints, or the choice may be arbitrary. The straight edge 11 of the blade 10 is then aligned with the chosen line and the arms 14, 14 are unlocked by placing the lever 32 at its broken-line position and are swung outwardly to overlie the guide element 35. Guide pins 37 are placed in apertures of corresponding distances from the center line 38 of the element 35 and the arms are swung into engagement with the pins. To insure that each arm engages a pin, the blade 10 may be required to be shifted longitudinally along the chosen line, but when the arms are so engaged, they are locked in proper position by displacing the lock member 32 to center position as shown in solid lines in FIG. 2. With the arms in locked position, the blade will properly determine the perspective lines at that side of the center line. In this manner, all of the perspective lines at the left side of the center line may be drawn. The same procedure may be used for drawing the perspective lines at the right side of the center line. Here again, a given perspective line may be chosen arbitrarily, or may be copied from a photoprint or the like, or if desired to follow a 30°–60° perspective or any other given plan-angle perspective.

When drawing perspectives in which the sight line is not within the confines of the sheet of drawing, the guide bar center line 38 cannot be aligned with the sight line. However, the perspective device may still be employed by positioning the guide bar at right angles to any given perspective line of the drawing at the index 38 of the guide bar. To copy an existing perspective, the guide bar 35 is set with its index 38 at any perspective line and is disposed perpendicular to the line. The straight edge is then registered with a second perspective line and both arms are engaged with the guide pins. This is not an involved procedure, however, and can be done quite simply.

A particular embodiment of the present invention has been herein illustrated and described but it is not intended to limit the invention to such disclosures and changes and modifications may be made therein and thereto within the scope of the following claims:

I claim:

1. In a perspective device, a blade having parallel faces and a straight edge at one side thereof, a casing rigidly mounting said blade comprising a pair of opposed face plates disposed flush against the faces of said blade, each face plate having a flat face parallel to the faces of said blade, a pair of elongated arms each having stub shafts journalled in said face plates and pivotally mounting said arm therebetween, circular gear segments on said arms concentric with said shafts, the gear segment of one arm meshed with the gear segment of the other arm to effect simultaneous angular adjustment thereof, and means confined between said face plates to lock said arms in adjusted position comprising a trifurcated plate mounted with its central portion intermediate said stub shafts and its outer leg portions embracing said shafts, and locking means to bias said leg portions together to clamp against each of said stub shafts.

2. A device according to claim 1 wherein said locking means comprises a lock lever having a pair of offset pins, one of said pins pivotally mounting said lever on one leg portion for movement in a plane parallel to said trifurcated plate, and the other pin engaged with the other leg and operable upon pivotal movement of said lever to bias said other leg portion toward said one leg portion.

3. A device according to claim 2 wherein the free extremities of said leg portions are formed with inwardly projecting lugs, said lugs overlapping one another and mounting the pins of said lock lever.

4. A perspective drawing kit including a perspective device in accordance with claim 1 and a guide bar comprising an elongated member having a central index, upwardly projecting guide pins equally spaced at opposite sides of said index to engage and guide the arms of said perspective device, means defining a longitudinal recess in said member adapted to receive the heads of fasteners, and a plurality of apertures in the bottom of said recess to receive the shanks of fasteners.

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