Dec. 7, 1965 J. H. MALVEN 3,221,410

PERSPECTIVE DRAWING INSTRUMENT

Filed Dec. 9, 1963 3 Sheets-Sheet 1

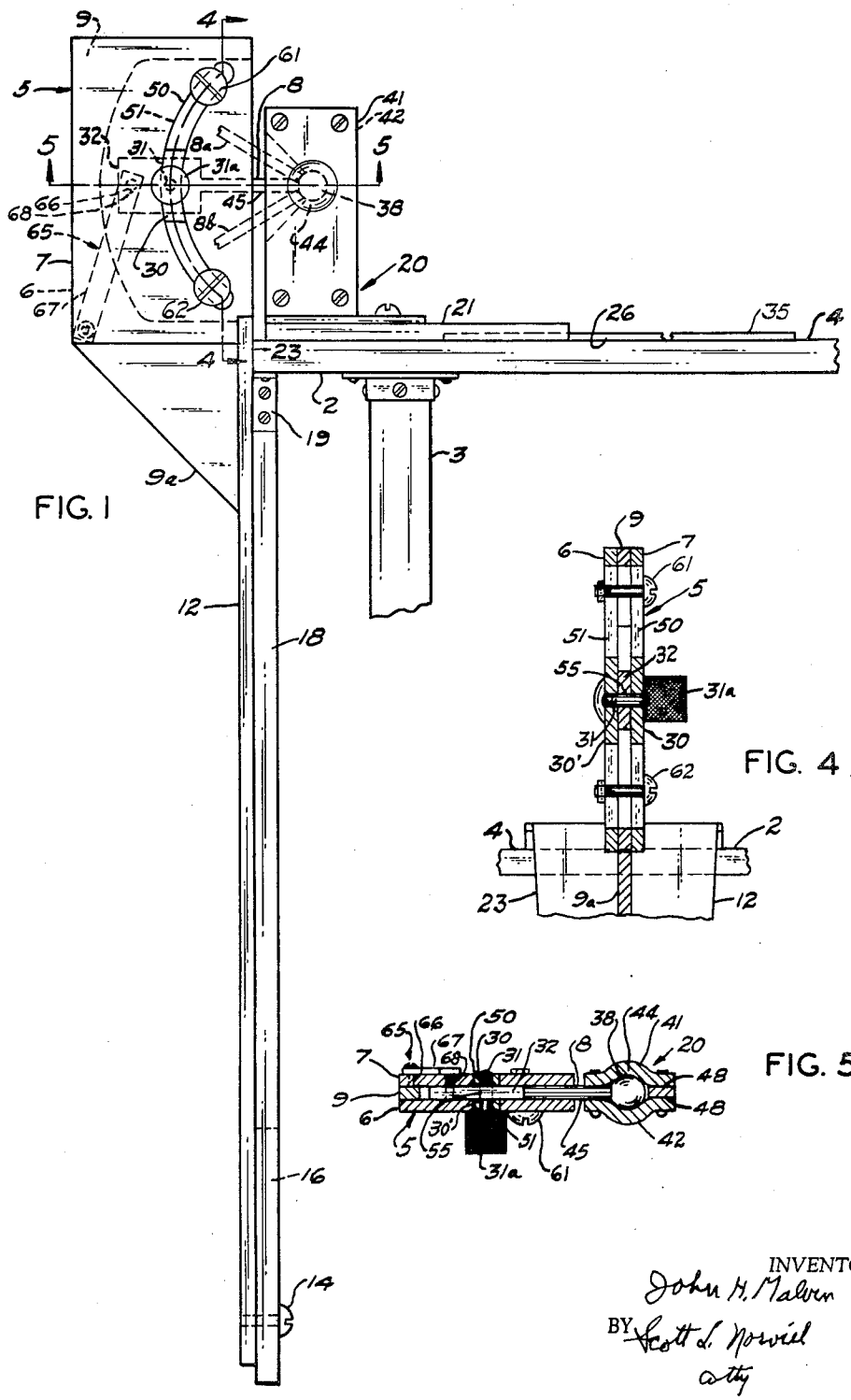



FIG. 1




FIG. 4




FIG. 5

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PERSPECTIVE DRAWING INSTRUMENT

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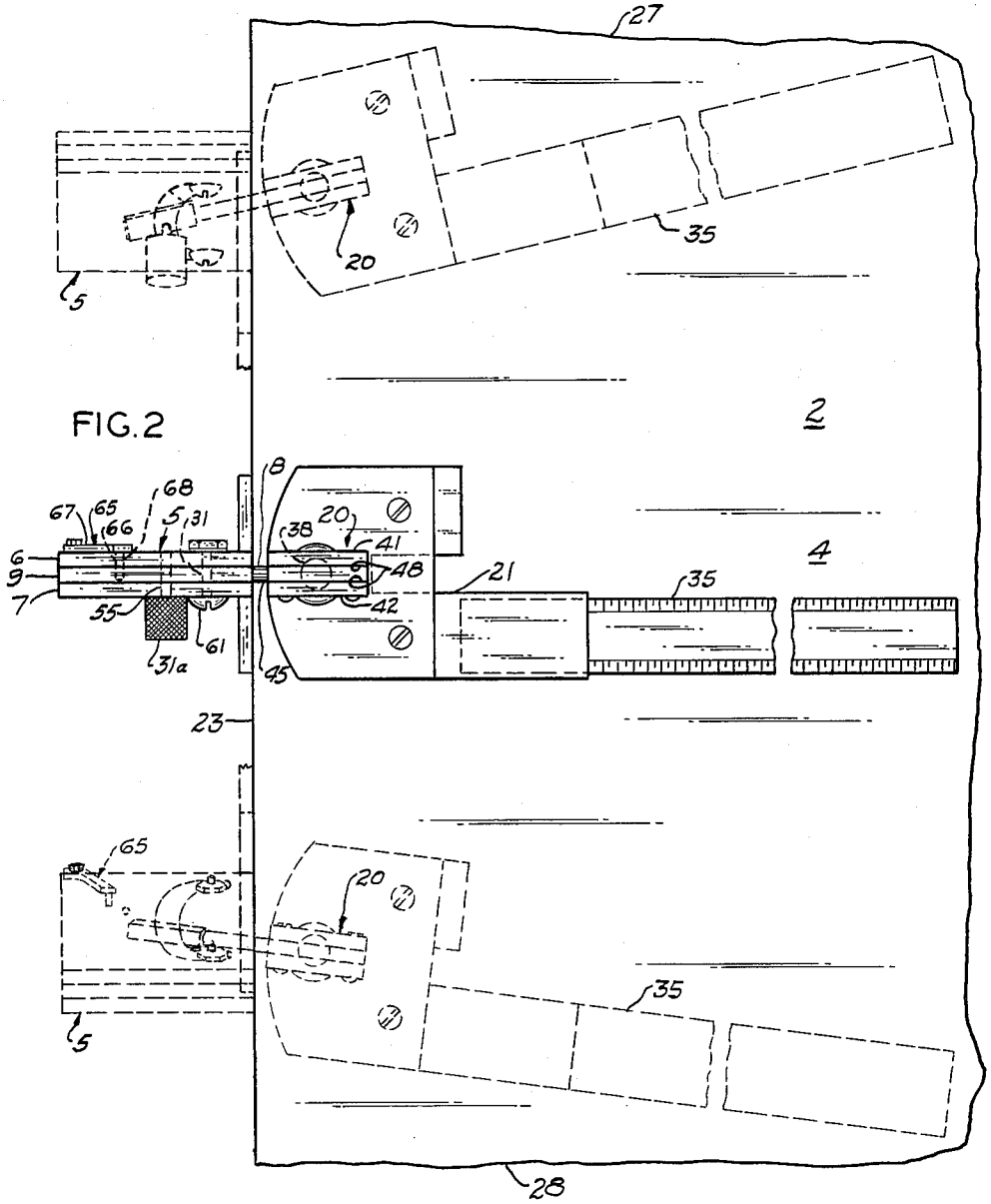



FIG. 2

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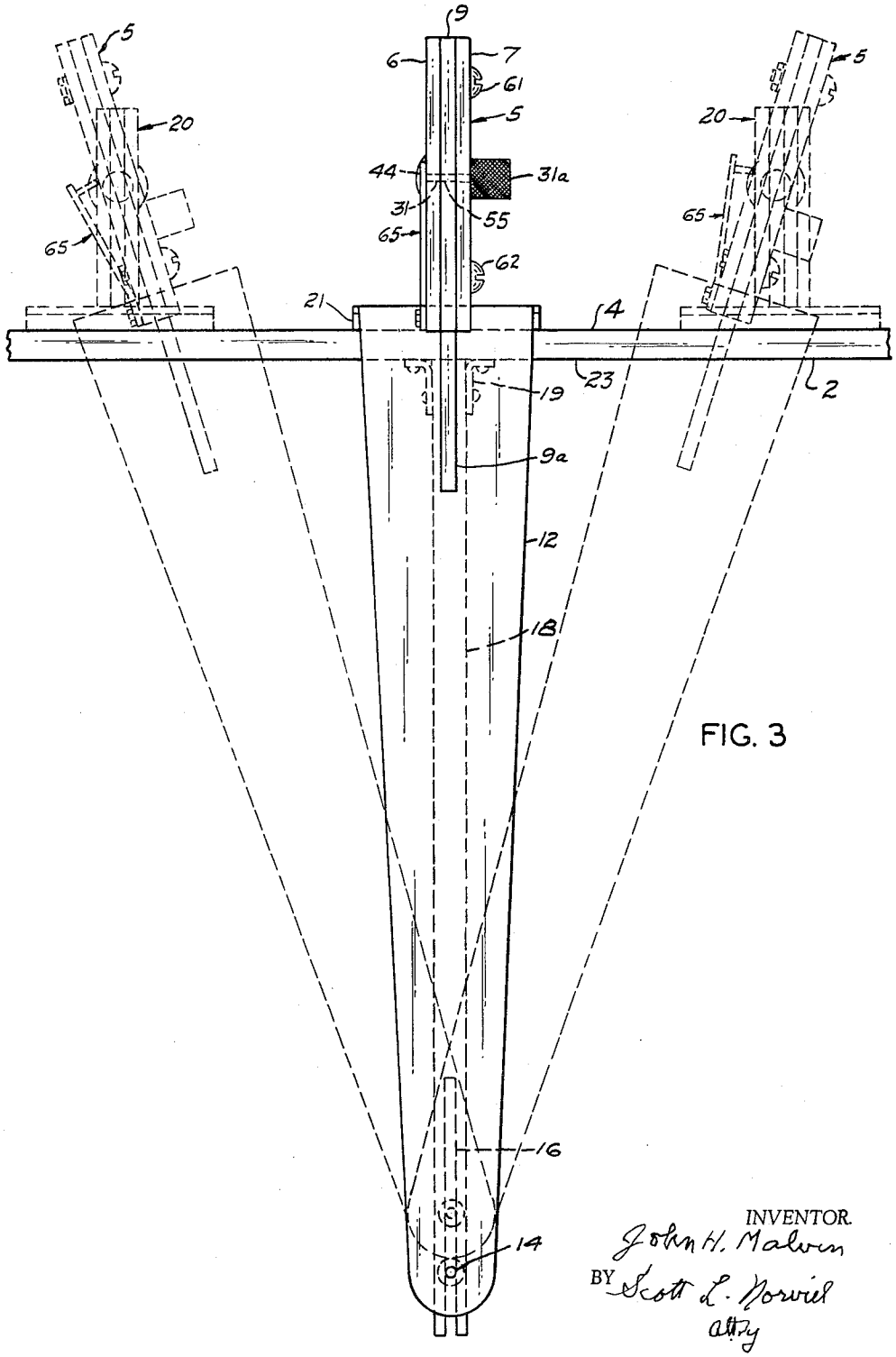



FIG. 3

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3,221,410

# PERSPECTIVE DRAWING INSTRUMENT

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3 Claims. (Cl. 33—77)

This invention concerns an instrument for use in making perspective drawings and particularly in laying out the straight line portions of a perspective drawing so that the lines will properly converge at various vanishing points along vanishing traces on the right and left side of the drawing.

One of the objects of the invention is to provide a drawing instrument which will be used in connection with the drawing board and can be adjusted so that a ruler carried on the instrument can be used to guide a pencil or pen to make angular lines that will meet at the proper vanishing traces on either side of the center of the drawing paper on the board.

Another object is to provide an instrument, as above stated, which is adjustable so that the lines which converge in vanishing points on the sides of the center of the drawing can be brought into convergence at varying distances from the center of the drawing.

Another object is to provide a means for holding the ruler in a horizontal position, locked so that it may be used in conjunction with a triangle or other ancillary instrument in drawing orthographic projections or shop drawings, or the like.

I attain the foregoing objects by means of the devices, parts and combinations of parts shown in the accompanying drawings, in which

FIGURE 1 is a side elevational view of the drawing board and the instrument herewith concerned;

FIGURE 2 is a plan view thereof with movements of the ruler and ruler head and perspective head shown in dotted lines;

FIGURE 3 is an end view of the perspective instrument here concerned and an edge view of the drawing board;

FIGURE 4 is a sectional view of the perspective head of the instrument drawn on line 4—4 of FIGURE 1; and

FIGURE 5 is a sectional view taken on line 5—5 of FIGURE 1.

Similar numerals refer to similar parts in the several views.

The drawing board 2 is supported on the pedestal 3 or other suitable support. On the upper face 4 of this board the paper is attached with thumb tacks in the usual manner and this may be considered the drawing surface and it further may be considered to be substantially held in a horizontal plane by the pedestal 3.

The perspective head 5 is composed of two plates of plastic material, or its equivalent, 6 and 7. Between these there is held one end of a shaft 8 which end is flattened to fit between the plates 6 and 7. Spacer plate 9 is used to complete the thickness of the head which is, in turn, supported on the top end portion of a perspective lever 12. The head thickness is aided by the gusset 9*a* which is a part of the separating plate 9 of head 5. The lower end of lever 12 is provided with a guide bolt 14 which has a shank that works smoothly in the slot 16 in the depending leg 18. The upper end of leg 18 is attached to the under side of the left edge of board 4 by a bracket 19. Attached to head portion 5 by the perspective shaft 8 is a ruler head 20. This has a lower or body portion 21 which has a lower flat face that rides smoothly on the upper surface of board 4 adjacent the left edge 23 of the board. The weight of the head 5, as well as head 20, is carried on this flat surface and on



the flat lower surface rule 26 is carried in fixed relation. The ruler is adjusted so that its upper edge, which is the edge on which the drawing instrument runs is aligned with the horizontal center of the board when the head is in mid-position between the top and bottom edges 27 and 28 of the board.

The shaft 8 has its left or inner end flattened to work between the plates 6 and 7 of head 5. The center of this flattened portion is bored to receive screw 31 which holds arcuate guides 30 and 30′, which slide in arcuate slots 50 and 51 in plates 6 and 7. It should be noted that the flattened plate portion 32 of the shaft, and which is included between the plates 6 and 7, acts as a support and an anchor for the outer end of shaft 8. The outer end of shaft 8 is provided with a ball 38. This ball is held by semi-spherical recesses, forming a socket, between vertical plates 41 and 42 of the ruler head 20. This construction forms a ball and socket joint and permits the motion necessary to permit the ruler head 20 to run flat on the board 4 while the perspective head tilts as it is moved along the edge 23 of the board. While the ball and socket joint 44 permits the ball 38 to rotate, the shank 45 of shaft 8 is nevertheless held against horizontal swinging motion by the fact that it is held between the flat faces 48 of plates 41 and 42. This construction permits the base plate 21 of the ruler head to slide over the upper face of board 4 while holding the plates 41 and 42 in a vertical position and permitting the slide contacting area adjacent edge 23 to act as a guide.

As the head 20 moves along the edge of the board the perspective lever 12 operates and tilts head 5 because of the fact that screw 14 is confined in the slot 16 in the depending leg 18. The above motion will cause the ruler head to twist, as shown in FIGURE 2, and, therefore will hold the ruler 35 at angles, as shown in FIGURE 2 in dotted lines.

To vary the distance at which the lines, which may be drawn by use of ruler 27 converge from the center of the drawing paper on board 4, I provide arcuate slots 50 and 51 which receive the arcuate guide blocks 30 and 30′. The shaft 55 goes through the head transversely and then blocks 30 and 30′ and can be positioned at various points along the arcuate slots 50 and 51 by tightening the nut 31*a*. In this way the angle of the shaft 8 may be varied as indicated by dotted lines 8*a* and 8*b* in FIGURE 1. This will vary the points at which lines drawn along the ruler 35 will converge relative to the center of the paper placed on the board 4.

Stop screws 61 and 62 are used to limit the travel of blocks 30 and 30′ in slots 50 and 51. Thus the limit of the point of convergence of the perspective lines can be set.

In order to hold the ruler 35 and head 20 in fixed horizontal position I provide the latch 65, composed of pin 66 held by spring 67 and normally urged into a hole 68 in plate 6. When the ruler is thus fixed the instrument may be used as an ordinary T square.

In use drawing paper is placed on the upper face 4 of the drawing board. Median line can then be drawn using the ruler with a perspective head 5 as set in the mid-position as shown particularly in FIGURE 2. This establishes a horizontal center line. Lines to appear on the drawing that slant upward can be drawn as shown in the upper dotted line figure. Lines that slant downward can be drawn as shown in the bottom dotted line figure. In case the ruler 35 is to be used for standard orthographic projective drawings the head 5 can be locked by the use of latch 65, as above explained. In case the drawing requires perspective lines that meet at a point of convergence then the head is used as above explained and the ruler permitted to swivel also as above explained. Motion is communi-

cated from the perspective head 5 to the ruler head 20 by shaft 8. It is noted that this shaft is fastened to the perspective head by the screw 31 as previously described. This fastening makes the shaft 8 turn with the head; however the fastening of the outer end of the shaft to the ruler head 20 is through ball 38 which turns in a socket formed between the plates 42 and 44 of the ruler head. The ball 38 permits the ruler head and ruler to be lifted from the board but the gripping of the shaft 8 between the edges of the slot formed between the plate portions 42 and 44 hold the ruler head to prevent it from tilting. The ruler head lies flat on the upper face of the board 2. When the perspective head 5 is tilted and the shaft 8 turns and the ruler head 20 together with the ruler 35 which it carries is forced to the angles shown in FIGURE 2. These angles have been determined to be correct for a perspective drawing laid out with its center line coinciding with the line previously described as drawn on the uper edge of ruler 35. The point of convergence is changed by shifting the shaft 8 in the arcuate slot 51 to give it the different positions indicated as 8*a* and 8*b*.

The expressions "vanishing point or vanishing trace" of the lines drawn are the same as used in perspective drawing. It will be recalled that in perspective drawing if the guide lines are stationary all lines meet at a vanishing point. When the guide lines of a given drawing vary then they all meet in a vanishing trace which is a line on one side of the center of the drawing and in which the varying lines intersect.

I claim:

1. An instrument for locating and drawing perspective lines on a drawing board comprising a drawing board supported by a pedestal, said board having an upper drawing face, an upper edge and a lower edge, and a working edge along one side, a perspective head slideably supported to move along the working edge of said drawing board, a leg depending from the board below the working edge, a lever connected with said perspective head and pin means slidably connecting said leg and said lever at their distal ends, a ruler head having a ruler extending across said drawing board and held at one end by said ruler head, a perspective shaft connecting the perspective head with the ruler head, said shaft having a flattened pivotally held



outer end and a ball at the inner end connected to said ruler head by a socket therein, means for adjustment of the angle that said shaft maintains relative to the vertical in said perspective head so that the angle of said perspective shaft may be varied with reference to the vertical position of said perspective head.

2. A drawing board having an upper face and a top edge and a bottom edge and a working straight edge along one side of the board, a supporting pedestal for said board; a leg depending from the center of the board below the working edge, said leg having a vertical guide slot within its lower portion, a perspective head having a rectangular body flat sides held by a depending perspective lever to slide along the working edge of said board and having a guide bolt sliding in the guide slot in said depending leg, said head having arcuate slots extending transversely through the body of said head to provide means for adjusting the positions at which lines drawn by use of said head will converge on said drawing board, arcuate guide blocks slideably operative in said guide slots and a transverse bolt having a holding nut extending through said guide blocks to hold them in predetermined positions, a ruler head having a flat bottom face to slide on the face of said board adjacent said working straight edge, a ruler on said head extending inwardly from said working edge across the face of said board, a perspective shaft having a flattened outer end portion to fit into said perspective head adjacent said guide blocks, a ball at the outer end of said perspective shaft adapted to fit workaby in said ruler head.

3. The device described in claim 2 having stops comprising screw heads attachable to said perspective head and extending through the arcuate slot on one side of said head to limit the motion of said arcuate guide blocks in said arcuate slots, whereby the adjusting movement of said bolt which extends through said arcuate blocks may be limited in its travel in said arcuate slots.

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ISAAC LISANN, *Primary Examiner.*