D. A. OGILVIE.

PERSPECTIVE DRAFTING APPLIANCE.

APPLICATION FILED AUG. 5, 1913.

1,122,533.

Patented Dec. 29, 1914.

2 SHEETS—SHEET 1.

Fig. 1

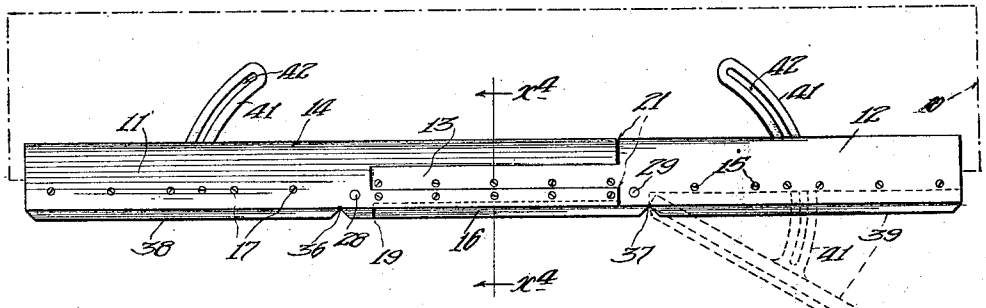


Fig. 2

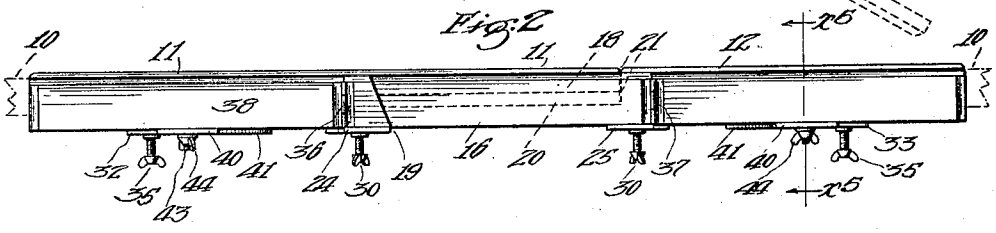


Fig. 3

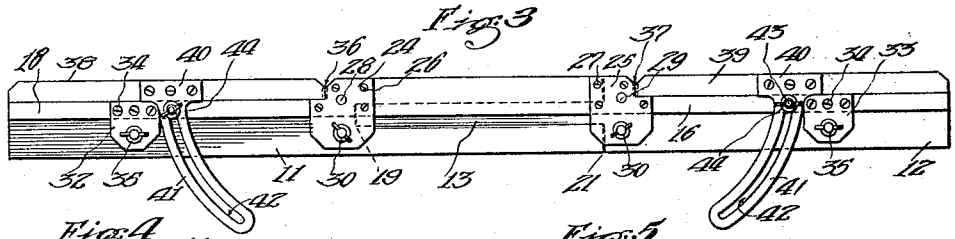


Fig. 4

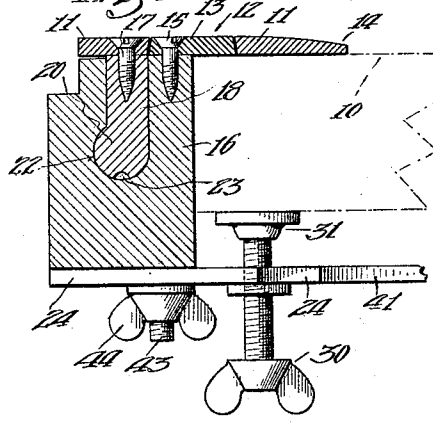
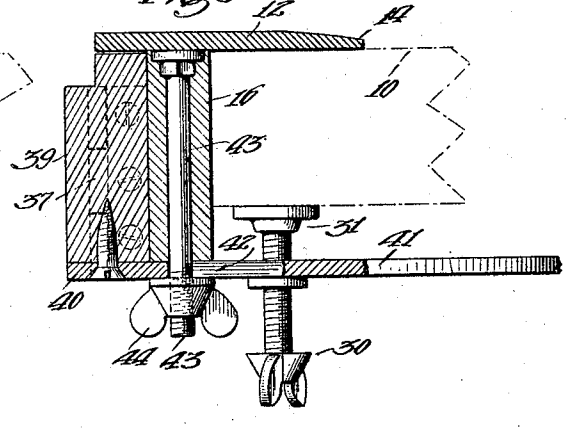


Fig. 5



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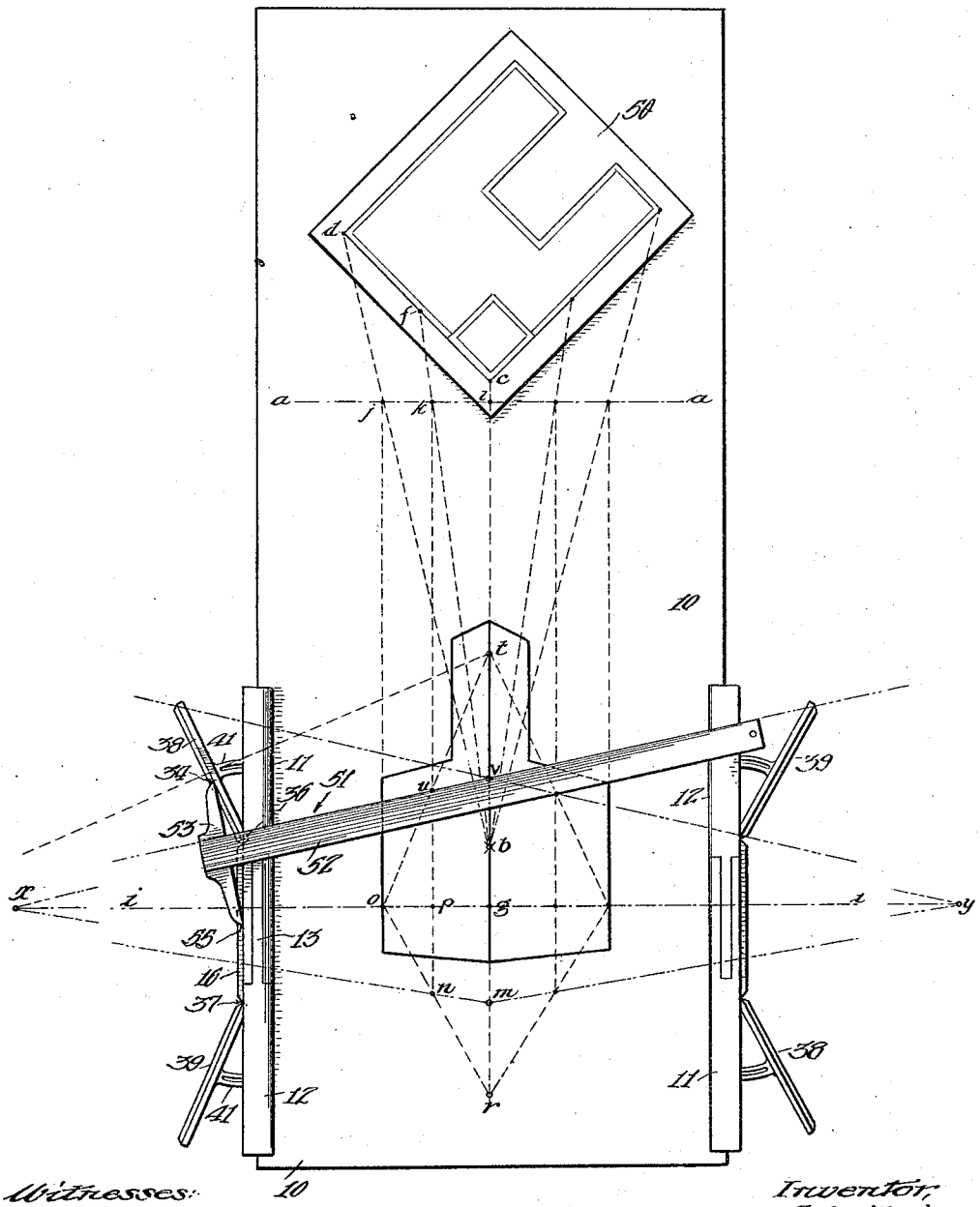
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1,122,533.

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2 SHEETS—SHEET 2.

Fig. 6



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UNITED STATES PATENT OFFICE.

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PERSPECTIVE DRAFTING APPLIANCE.

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To all whom it may concern:

Be it known that I, DAVID A. OGILVIE, a subject of the King of Great Britain, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Perspective Drafting Appliance, of which the following is a specification.

My invention relates to instruments used in producing mechanical drawings of the class known as perspective drawings, and particularly to instruments for producing perspective drawings such as are ordinarily made by architects. In the production of such drawings it is common to locate vanishing points to which the lines which represent the horizontal lines upon the plane sides of the object to be delineated converge. In the production of the ordinary forms of architectural perspective drawings these vanishing points are necessarily often located at a considerable distance from the perspective view proper, and this fact necessitates long straight edges and large surfaces upon which to draw the construction lines. Such large drawing boards are expensive and difficult to maintain, besides taking up an undue amount of space. Long straight edges are also expensive and difficult to maintain and in addition are extremely awkward and clumsy to manipulate. Where such large drawing boards and long straight edges are used, progress is necessarily slow and perspective drawings are expensive to produce by ordinary means.

The principal object of my invention is to provide a perspective drafting appliance which will enable the draftsmen to readily construct that class of drawings known as perspective drawings without the necessity for actually locating the vanishing points and without the necessity of using large drawing boards or long straight edges.

A further object of my invention is to construct the necessary perspective drafting appliance in a convenient form which may be readily attached to existing drawing boards and which may be adjusted to suit the lengths of heads of standard T-squares, such as are commonly used by architects and engineers.

Further objects and advantages will appear hereinafter.

Referring to the drawings, which are for illustrative purposes only: Figure 1 shows a plan view of my invention as seen from above. Fig. 2 shows a side view. Fig. 3 shows a plan view of my invention seen from below. Fig. 4 shows a section along the lines x^4—x^4 of Fig. 1 looking in the direction of the arrows. Fig. 5 shows a section along the lines x^5—x^5 of Fig. 2 looking in the direction of the arrows. Fig. 6 shows the application of my invention to a specific problem.

The particular form of my invention which is shown in these drawings is adapted to clamp upon the edge of a drawing board 10 shown in dotted lines in Fig. 1, Fig. 2, Fig. 4 and Fig. 5, and in full lines in Fig. 6. This particular form consists of two metal plates 11 and 12, the plate 12 being provided with a tongue 13 which extends into a corresponding slot in the plate 11. These plates are preferably of metal and are beveled as shown at 14. The plates 12 is secured by means of the screws 15 to a body member 16, preferablv of wood. The plate 11 is fastened by means of screws 17 to a body member 18 which is also preferably of wood. The member 16 and the member 18, together with the plates 11 and 12 to which they are attached, are adapted to slide longitudinally with relation to each other, the member 16 extending to a point 19 and the member 18 being provided with a tongue 20 which extends to a point 21 in a recess in the body of the member 16. This tongue 20 is preferably of the form shown in Fig. 4, having an enlarged lower portion 22 which has at the lower end thereof a groove 23 for purposes of lubrication. This enlarged lower portion 22 is provided to hold the members 16 and 18 in a straight line. The members 16 and 18 have secured to the underside thereof, by means of screws 26 and 27, metal clamping plates 24 and 25, which are also secured to the plates 11 and 12 by means of the rivets 28 and 29. The plates 24 and 25 are provided with thumb screws 30 which have an enlarged end 31 adapted to bear upon the under surface of the drawing board 10 and to clamp the plates 24 and 25, together with the parts attached thereto, securely to the drawing board. Additional clamping plates 32 and 33 are secured by screws 34 to the members 16 and 18, and thumb screws 35 having enlarged ends are provided for the purpose of further clamping the members 16 and 18 to the drawing board 10. Fastened to the members 16 and 18 by means of the hinges 36 and 37 are the

wings 38 and 39, these wings being provided with lower segmental plates 40 having circular arms 41 and slots 42 therein. Locking thumb screws 43, secured in the members 16 and 18, extend downwardly through the slots 42 and are provided with thumb nuts 44 by means of which the arms 41 are securely locked in place. The wings 38 and 39 turn about the hinges 36 and 37, and may be placed in a variable angular relation to the edge of the board and securely locked in this relation by means of the thumb nuts 44.

The method of operation of my device is as follows: When it is desired to make what is known as a perspective drawing of a building, the drawing board 10 is covered with a sheet of drawing paper and a plan of that building delineated upon sheet of paper 50 is tacked over this paper upon the upper end of the drawing board 10, as shown in Fig. 6. The line *a*—*a* is then selected perpendicular to the sides of the drawing board, this line being known as the plane line and being the line of intersection with the surface of the drawing board of a plane perpendicular to the drawing board, upon which the perspective drawing may be imagined as being made. A view point *b* is then selected, the distance from the corner of the building *c* to the point *b* being the distance that the observer is supposed to be from the building, this distance *b*—*c* being taken to the same scale as the original plan delineated on the sheet 50. The point *b* should be taken on a line at right angles to the line *a*—*a* and passing through the corner point *c* of the building. Construction lines are then drawn connecting the point *b* with the corner *d* of the building and a centrally located intermediate point *f* is found upon the sides of the building and the lines *b*—*d* and *b*—*f* are then drawn. A horizontal line *i*—*i*, commonly called the horizon line, is then selected crossing the drawing board at right angles to the line *b*—*c* projected. The intersection of the various lines from the point *b* to the points *d*, *f* and *c* with the line *a*—*a* are then found, these being the points *j*, *k* and *l*. Perpendiculars are then dropped from these lines to and through the horizontal line *i*—*i* intersecting that line upon the points *o*, *p* and *q*.

It should be understood that generally in perspective drawings of buildings vertical lines are shown parallel, as the tapering effect, due to the perspective in ordinary buildings, is very small. While my invention may be utilized to introduce a true perspective in which the vertical lines, as well as the horizontal lines taper, the following description is intended to cover the production of an ordinary architectural drawing in which the vertical lines are drawn parallel and at right angles to the horizon line.

In the standard method of producing perspective drawings of cubical objects such as buildings, a horizon line *i*—*i* is selected and vanishing points *x* and *y* are located thereon, each of these vanishing points being a point at which the lines which represent horizontal lines upon one of the plane sides of the building converge. In such drawings, however, the distances *q*—*x* and *q*—*y* are generally long ones and if the points *x* and *y* are to be actually found upon the surface of the drawing board, an extremely large drawing board is necessary and a long straight-edge is also necessary, both being open to the objections hereinbefore mentioned.

The principal object of my invention is to provide means whereby these vanishing points *x* and *y* need not be actually located, and whereby perspective lines may be produced which would approximately follow lines which would converge at such vanishing point if they existed.

My further object is to produce these perspective lines upon a drawing board only slightly larger than the perspective drawing to be produced and without the use of straight edges other than the standard types and sizes of the T-squares commonly used in mechanical drawing.

The methods of construction of producing such a perspective drawing upon either side of the line *c*—*b* are exactly similar and I will describe the construction shown upon the left of that line in Fig. 6. Having given the horizontal line *i*—*i* and the line *c*—*b*, it is necessary to define by construction two perspective lines at the left of *c*—*b*, one of these lines lying above the line *i*—*i* and one below the line *i*—*i*. These perspective lines may be imagined as intersecting at the point *x*, which is, however, a purely imaginary point located at some inaccessible point beyond the edge of the drawing board. This construction is produced as follows: The line *o*—*q* may be regarded as the base in perspective of any rectangle located upon the same plane as *c*—*d* and having the same width as *c*—*d*. This rectangle may be considered as being either above or below the horizon line. Any convenient distances *g*—*t* and *g*—*r* are then assumed as representing the height in perspective of two rectangle walls erected upon the line *c*—*d* above and below the horizontal line respectively. The diagonals *o*—*t* and *o*—*r* are then drawn, these representing the only possible diagonals for such rectangles. *k*—*p* is a line in perspective drawn vertically at half the width of the building, therefore the points *u* and *n*, where this line *k*—*p* intersects the diagonals *o*—*t* and *o*—*r*, are the perspective centers of the two rectangles having the base *o*—*g* and the height *q*—*t* and *q*—*r* respectively. The points *v* and *m* are then located, these points being midway between

the point g and the points t and r respectively. The lines u—v and the lines m—n are then drawn through the points and represent perspective lines through the center of the perspective rectangles having a width o—g and a height g—t and g—r. The construction up to this point has been formed without the use of my perspective drafting appliance. This appliance is now placed upon the board, a T-square 51 of the ordinary form of construction being provided for use therewith. This T-square consists of a blade 52 and a head 53 at right angles thereto and having corners 54 and 55. The upper edge of the blade 52 is placed upon the horizontal line i—i previously selected and the plate 12 is clamped upon the board in such a position that the hinge 37 coincides exactly with the corner 55 of the head 53. The plate 11 is then moved up or down until the hinge 36 coincides exactly with the corner 54 of the head 53. The T-square is then placed with the upper edge of the blade 52 upon the line u—v, the corner 55 being maintained in close contact with the edge of the plate 11. The wing 38 is then swung until the edge thereof touches the corner 54 and the wing is then clamped firmly in position. If the T-square 51 is then moved up and down, a line passing along the upper edge of the blade 52 thereof will pass very close to the imaginary vanishing point x, and the lines drawn by the upper edge of the T-square will always be sufficiently close to the true perspective lines representing horizontal lines upon the sides c—d of the building at various heights above the horizontal line i—i for the purposes of perspective drawing. In a similar manner the upper edge of the blade 52 of the T-square 51 is placed in a position coinciding with the points m and n, the corner 54 being maintained in close contact with the plate 11. The wing 39 is then swung upwardly until it touches the corner 55 and the wing is adjusted in this position. The T-square may then be moved up and down and will draw approximate perspective lines representing horizontal lines upon the side of the building c—d below the horizon line i—i. The construction upon the right hand side of the line c—b is exactly similar to the construction already described, my perspective drafting appliance being clamped upon the right hand edge of the board and exactly similar steps being taken to those already described.

In the ordinary type of perspective drawing of a building the vertical taper due to perspective is very small and it is common in the production of such drawings to neglect the vertical taper altogether drawing the vertical lines at right angles to the vertical lines i—i. In some classes of architectural drawings, such, for example, as perspective drawings of very high buildings, towers, monuments or the like, this vertical taper becomes of sufficient importance to be detected and in the production of such drawings vertical dimensions are tapered as well as the horizontal ones. This can be done by clamping my perspective drafting appliance on the top and bottom of the board and proceeding in exactly similar manner as that already described. In all such constructions it is evident that a single drafting appliance may be used, being shifted about to the desired positions, or a plurality of such devices being simultaneously clamped upon the various edges of the board.

It should be understood that the method of producing the perspective lines by the use of wings, as described above, is not a mathematically exact one, but is sufficiently close for all practical purposes.

I claim as my invention:

1. A perspective drafting appliance comprising a straightedge adapted to be attached to a plane surface and a wing adapted to be secured in angular relation to said straightedge the upper edge of said straightedge and wing being in the plane of the surface.

2. A perspective drawing appliance adapted to be used with an ordinary T-square and comprising a straightedge adapted to be secured to a plane surface, and having a length equal to the head of the T-square and wings at each end of said straightedge adapted to be secured in angular relation to said straightedge.

3. A perspective drawing appliance adapted to be used with an ordinary T-square and comprising a straightedge of variable length and wings adapted to be secured in angular relation to said straightedge.

4. A perspective drafting appliance comprising a straightedge adapted to be attached to the edge of a drawing board, and two wings hinged to said straightedge and adapted to be secured in angular relation to said straightedge, the hinge points of said wings being adapted to be placed a variable distance apart on said straightedge.

5. A perspective drafting appliance comprising a straightedge consisting of telescoping metal plates secured to telescoping body members, clamping plates secured to said body members, clamping screws in said clamping plates adapted to secure the instrument to a drawing board, a wing hinged to each of said body members, and means for receiving the adjustment each of said wings in angular relation to said body members.

6. A perspective drafting appliance comprising a straightedge made up of two telescoping members, adapted to be secured to

the edge of a drawing board or the like, and a wing hinged to each of said members and adjustable in angular relation thereto.

7. In combination with a drawing board, a T-square, a straightedge adapted to be engaged by the head of said T-square, and wings hinged and secured in angular relation to said straightedge and adapted to be engaged by the head of said T-square.

8. In combination with a drawing board, a T-square, a straightedge adapted to be engaged by the head of said T-square, and wings hinged in adjustable angular relation to said straightedge and adapted to be engaged by the head of said T-square, the hinge points of said wings being adjustable along said straightedge to suit the different lengths of heads of various T-squares.

9. In combination with a drawing board and a T-square, a perspective drafting appliance comprising two straight edges connected to each other and placed at an obtuse angle with each other and having their upper edges in a plane parallel with the upper plane of said drawing board.

10. In combination with a drawing board and a T-square, a perspective drafting appliance comprising two straight edges connected to each other that are adjustable to form various obtuse angles with each other and which have their upper edges in a plane parallel to the plane of said drawing board.

11. A perspective drafting appliance comprising a straight edge adapted to be attached to a drawing board, and a wing that may either form an extension to said straight edge or be placed at an obtuse angle therewith in a plane parallel to the top of the drawing board, said straight edge and said wing being hinged to each other on a line perpendicular to the plane of said drawing board.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 30th day of July, 1913.

DAVID A. OGILVIE.

In presence of—
FRED. A. MANSFIELD,
P. H. SHELTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."