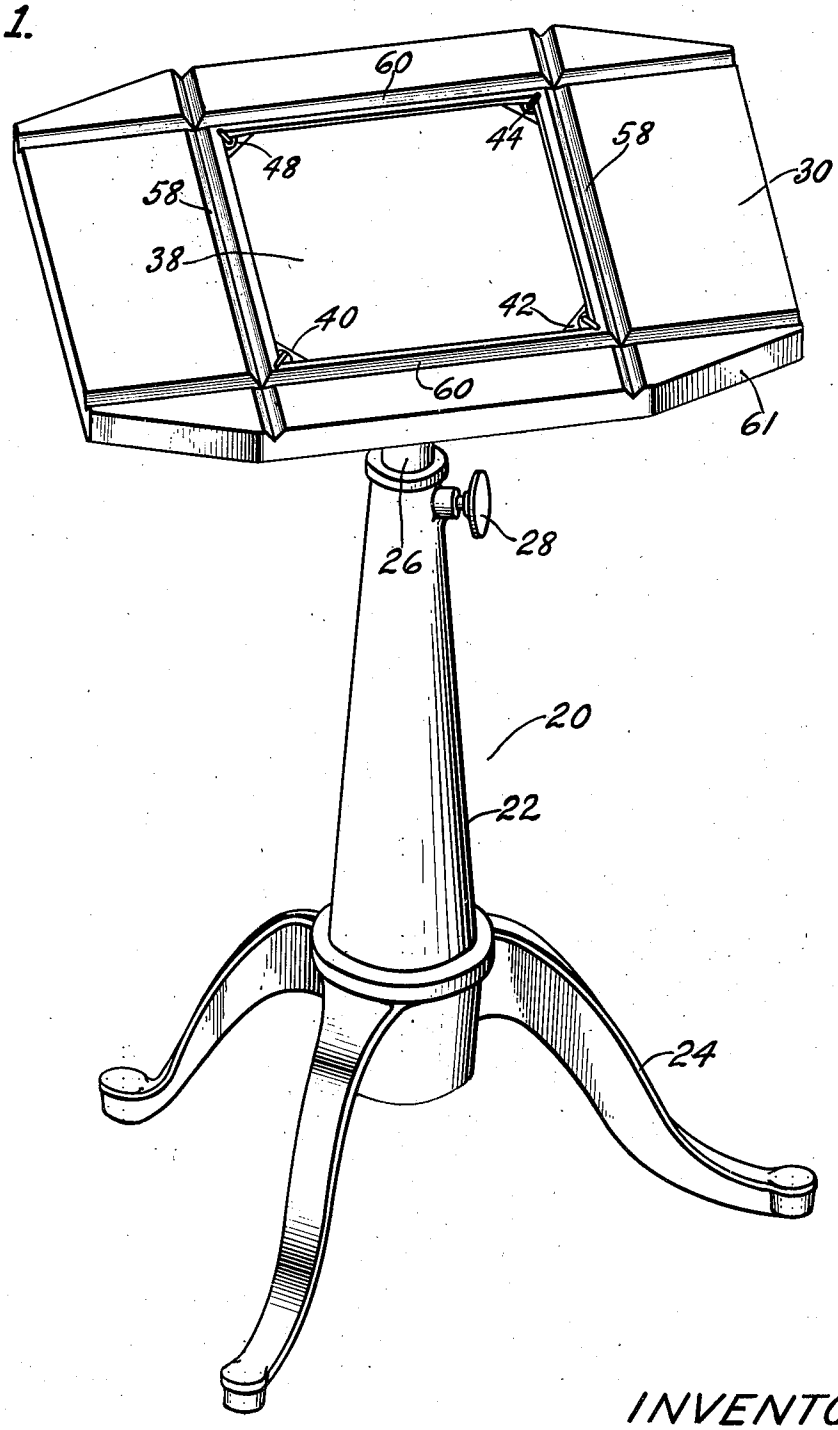
Oct. 29, 1940. F. W. COTTERMAN 2,219,766

DRAFTING EQUIPMENT

Filed Jan. 11, 1939 3 Sheets-Sheet 1

Fig. 1.



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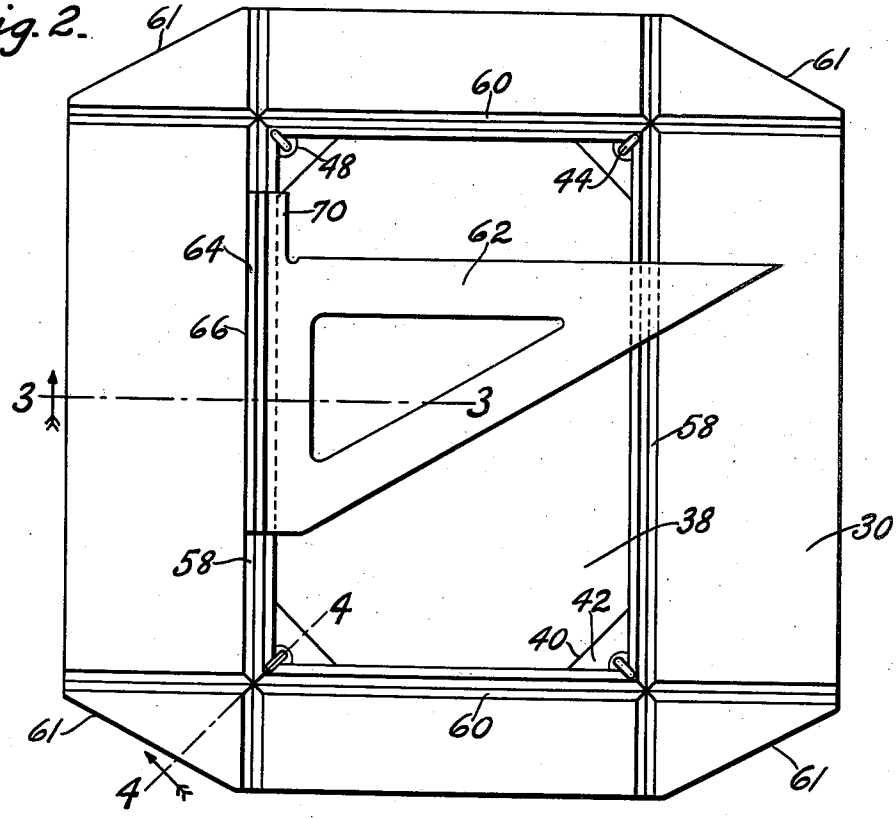
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Fig. 2.



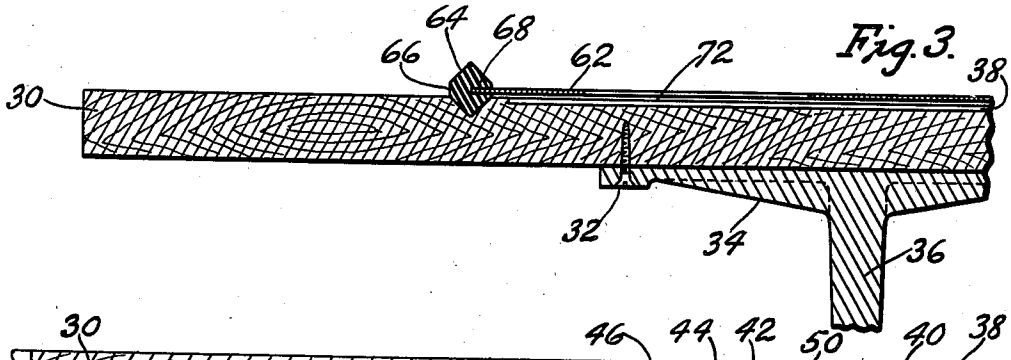


Fig. 3.

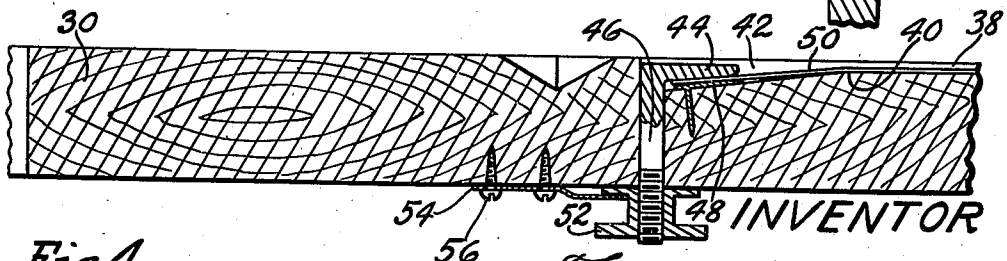


Fig. 4.

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Fig. 5.

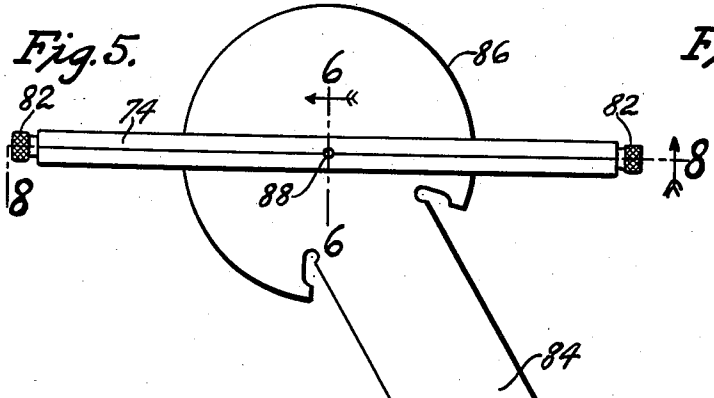
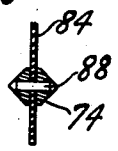


Fig. 6.



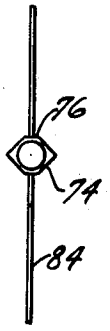
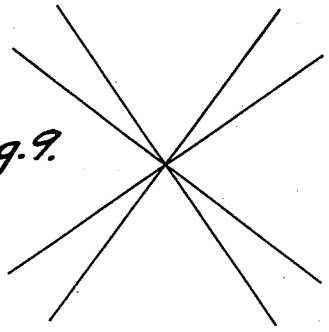


Fig. 7.

Fig. 9.



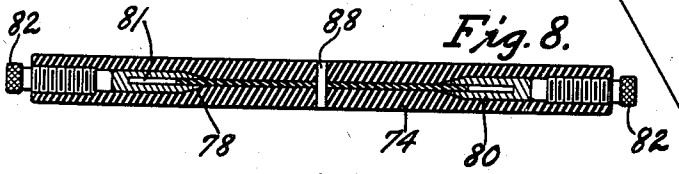


Fig. 8.

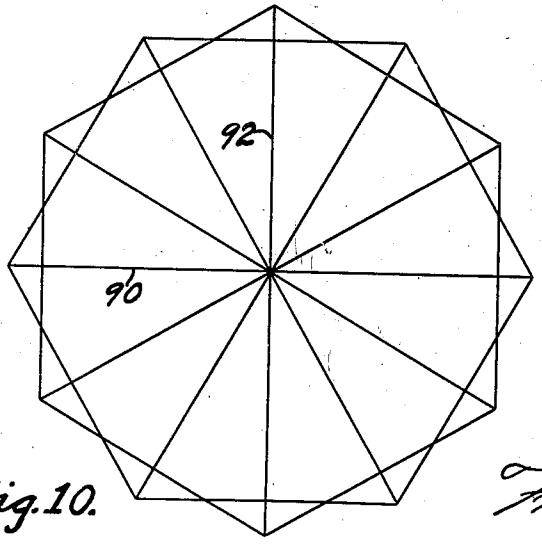


Fig. 10.

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Patented Oct. 29, 1940 2,219,766

UNITED STATES PATENT OFFICE

2,219,766

DRAFTING EQUIPMENT

Frederick W. Cotterman, Dayton, Ohio, assignor of one-half to Bessie D. Apple, Dayton, Ohio

Application January 11, 1939, Serial No. 250,323

7 Claims. (Cl. 33—76)

This invention relates to drafting equipment and particularly to drawing boards, angles, etc.

An object of the invention is to provide a drawing board having permanent clamping means for securing the drawing paper to the board whereby thumb tacks, adhesive tape and similar fastening means are unnecessary.

Another object is to so construct the clamping means that holds the paper to the board that there will be no part extending above the top surface of the paper, to the end that angles and similar tools may be moved over the entire working surface of the paper without encountering any obstruction.

Another object is to provide fixed means on the board and on the angle, which cooperate to guide the angle in the same manner as it may ordinarily be guided by a T square, to the end that the T square may be eliminated.

Another object is to provide adjustable means cooperating with fixed means on the board for drawing lines at various angles.

Another object is to so construct the board that a drawing may be removed when partly completed and afterward returned without attention to the question of aligning the drawing in its exact former position on the board.

Other objects and advantages will become evident as the invention is described in detail and reference is made to the accompanying drawings wherein,

Fig. 1 is a perspective view of the drawing board mounted on a conventional stand.

Fig. 2 is a top plan view of the board with an angle in operative position.

Fig. 3 is an enlarged fragmentary sectional view taken at 3—3 of Fig. 2 thru the board and the angle, showing the cooperating guiding means and the sunken panel into which the sheet of drawing paper fits.

Fig. 4 is a still further enlarged fragmentary sectional view taken diagonally at 4—4 of Fig. 2 showing the paper clamping means and the manner of treating the board to keep the top of the clamp at a height not above the top surface of the paper.

Fig. 5 is a plan view of an adjustable tool in the nature of a T square having guiding means for cooperating with the guiding means on the board.

Fig. 6 is a fragmentary sectional view taken at 6—6 of Fig. 5 thru the guiding means and pivot pin upon which the blade of the tool turns.

Fig. 7 is an edge view of the tool shown in Fig. 5.

Fig. 8 is a section thru the guide bar taken at 8—8 of Fig. 5.

Fig. 9 shows lines which may be made with the tool Fig. 5 at a single setting.

Fig. 10 shows a plurality of lines which may be made with the angle shown on the board in Fig. 2.

Similar numerals refer to similar parts thruout the several views.

There are a number of classes of drafting in which a uniform size of sheet is used. One of the most important of these is the making of Patent Office drawings. The equipment herein shown has particular advantages when used for this purpose.

The stand 20 is of conventional design comprising a pedestal 22 having legs 24, a rod 26 vertically slidable in the pedestal and a hand screw 28 for maintaining the vertical position of the rod.

The drawing board 30 may be secured to the stand in any convenient manner as by screws 32, Fig. 3, extending thru a spider 34 into the board. A tapered shank 36 on the spider is provided, and the shank should extend into a socket (not shown) so that the board may be quickly and easily rotated to bring any one of its several edges toward the draftsman.

The stand may include the conventional tilting means if desired, but any mechanism which will keep the top of the board sloping toward the draftsman at an angle of three to five degrees in any position to which it may be rotated will provide satisfactory operation.

The board 30 may be made of any suitable material, wood or molded plastic being satisfactory. Wood is indicated in the drawings, and, when used, should preferably be a close grained wood such as hard maple.

Hard maple plywood will meet the requirements of low cost and still be substantially non-warping, the latter quality being highly important in a device of this character.

A sunken panel 38 in the center of the board has a length and width equal to that of the sheet of paper to be used. Assuming for illustrative purpose, that the device herein shown is intended to be used in the making of Patent Office drawings, the panel 38 will then be ten by fifteen inches. Its depth may preferably be as much as the thickness of three sheets of three-ply Patent Office Bristol board.

Near the four corners of the panel 38 at 40, the panel starts to become deeper, sloping gradually downward toward the corners (see Fig. 4) to form depressions 42 for the toes 44 of the clamp bolts 46. The toes 44 of the bolts are sloped on

the underside to correspond to the slope of the depressions. Under the toes **44**, the bottoms of the depressions are preferably faced with metal. This facing is provided in the structure shown by squaring off two sides of the heads of round headed thumbtacks **48** and driving the tacks closely up in the corners. Fig. 4 shows how a sheet of Bristol board **50** is clamped between a toe **44** and the upper surface of the head of a tack **48**.

Thumb nuts **52** for tightening the bolts **46** are held against the bottom of the board by the metal strips **54** which are secured to the underside of the board by the screws **56**. When the thumb nuts are loosened the toes **44** are raised from the top of the paper and a drawing may be removed. Slots in the top of the board for the toes **44**, extending from the bolt hole diagonally into the panel, keep the bolts from turning.

Close up to the panel **38** on the long sides are the guide grooves **58**, and on the short sides, the guide grooves **60**. The guide grooves shown are V shaped and placed just far enough from the panel to make space between the panel and grooves for the holes for the clamp bolts **46**. No part of the clamp bolt holes should intrude either on the panel or on the guide grooves. The two guide grooves of each pair should be parallel with the sides of the panel and parallel with each other, and the grooves of one pair at right angles to the grooves of the other pair.

Where the board is intended for making Patent Office drawings, the outside dimensions are preferably about twenty-two inches square with the four corners cut off as shown at **61**. This size will permit the draftsman to look directly down on any part of the panel and will permit the board being turned on the shank **36** without interference with his body.

Shown cooperating with the board **30** in Figs. 2 and 3 is the thirty-sixty angle **62**. The angle proper may be made of hard rubber, Celluloid, or molded plastic, preferably of a transparent sheet not much over .06 or .07 inch thick. The guide bar **64** may be made by flattening opposite corners of a square bar as at **66**, then cutting a slot lengthwise in one of the flattened edges as at **68** and cementing the angle proper in the slot. A relatively long guide bar is provided by extending the angle near the base as at **70**.

The bar **64** may be made of hard rubber, molded plastic, or hard wood. Its size should be so selected that, in the finished angle, the angle will be raised slightly away from the upper surface of the board as at **72**, Fig. 3, when the bar **64** is bottoming in a groove **58** or **60**. This will minimize rubbing between the angle and the drawing as the angle passes thereover. Due to the fact that the angle is made from relatively thin sheet stock it may be pressed against the surface of the drawing whenever this is desirable by the weight of the hand. Since the guide bar **64** is made V shaped both top and bottom, it will be apparent that the angle may be turned upside down from the position shown.

Fig. 10 shows a figure made up of a number of straight lines, all of which were made with an angle such as is shown in Fig. 2, part of the lines with one surface of the angle upward and part with the other surface upward. By providing an additional angle having fifteen and forty-five degree sides instead of the right angle and thirty degree sides of the angle shown, the angles of Fig. 10 may all be bisected.

The tool shown in Fig. 5 is provided for all irregular oblique lines. Fig. 9 shows a series of oblique lines drawn without resetting the tool. It comprises a guide bar **74** which may be made by flattening two opposite edges of a length of square hard rubber rod as at **76**, Fig. 7. Opposite ends of the rod are provided with holes which terminate in a pointed seat **78** at the bottom. Metal plugs **80**, correspondingly pointed are slidable in the holes. The outer ends of the rod are tapped for the knurl head screws **82** which may preferably be made of hard fibre or similar material.

The blade **84**, which may be of rubber, Celluloid, or the like, has a circular head **86** and the guide bar **74** is slotted thru to receive this head snugly but movably. The plugs **80** are also slotted as at **81** from the pointed end to near the blunt end, the slots also being such as to receive the blade snugly.

A pin **88** extends thru the bar and blade to provide hinge means upon which the blade may be turned. Tightening the screws **82** forces the tapered inner ends of the plugs into the seats **78** thereby clamping the edges of the head **86** and holding it in any position to which it may have been turned.

The heads of the screws **82** should be small enough to clear the guide grooves **58** and **60** of the board. Obviously, when the blade **84** is once set to a given angle, the bar **74** may be laid in any one of the four guide grooves and with either surface of the blade upward.

In operation the angle **62** shown on the board in Figs. 2 and 3 will have the widest use. Assume, for instance, that two lines are to be drawn at right angles to each other such as the lines **90** and **92**, Fig. 10. The line **90** would, of course, be drawn with the guide bar **64** of the angle **62** in a guide groove **58**, Fig. 2. The hand should be laid on the angle near the guide bar **64** while the line is being drawn. Only moderate downward pressure is required to maintain the position of the angle.

Now, in order to draw the other line **92**, it is not necessary to pick up the angle and lay it down again with the guide bar **64** in the other guide groove **60**, but instead, after drawing the line **90**, the pressure of the hand on the angle is first lightened, then the board itself turned a quarter turn with the other hand. The turning of the board itself will force the guide bar **64** out of the groove **58**, and when the groove **60** comes around to the position before occupied by the groove **58**, the guide bar will drop into groove **60** naturally where it may again be held with moderate downward pressure of the hand while the line **92** is being drawn.

It will therefore be seen that one of the chief advantages of the equipment lies in the fact that the draftsman is not required to adjust his body to a position suitable first, for drawing a vertical line, then, for drawing a horizontal line, but the line to be drawn is quickly and easily brought to the most convenient position for drawing it, and the angle quickly and easily finds its place and drops into position.

Having described one embodiment of the invention in which sizes of parts, and materials therefor, have been suggested, it will be understood that these suggestions are not to be taken as limiting the invention further than defined in the appended claims, wherein,

I claim:

1. Drafting equipment comprising, a board having a pair of widely spaced apart parallel guide grooves extending across the top surface

thereof, and a like pair at right angles to the first, thereby leaving space for securing a drawing between the grooves, a blade adapted for ruling lines across said drawing, a guide bar pivotally secured to one end of said blade whereby said blade may be extended at various angles from said bar, said bar having two parallel guide ribs extending one above each side of the blade, each slidable in any of the four said grooves.

2. The structure defined in claim 1 with means for clamping the blade with respect to the bar in any of its angular positions.

3. Apparatus for making drawings of a fixed dimension, comprising a drawing board enough larger than the drawing sheet to allow a substantial margin around said sheet and having a sunken panel of the size of the drawing sheet and deeper than the sheet thickness, a pair of guide grooves at the ends of the panel parallel therewith and parallel with each other and a pair of guide grooves at the sides of the panel parallel therewith and parallel with each other, the one pair being at right angles to the other, the grooves being slightly away from the edges of the panel thereby enclosing a space slightly larger than the panel, the grooves crossing each other at the corners of the enclosed space and extending to the edges of the board, clamps for holding the drawing sheet to the bottom of the panel, secured to said board only in the margin between the panel and the space enclosed by the guide grooves, and not encroaching either on the guide grooves or on the panel, except for the toe ends extending laterally from the clamps over the drawing sheet, said panel being deepened at the points where said toes extend over it so that the tops of the toes are no higher than the top of the board, and a ruling blade having a cooperating guide piece at its end adapted to slide in either of said grooves from one end of the board to the other without interference with said clamps while said blade passes over said panel and the tops of said clamps.

4. The structure defined in claim 3 wherein the guide grooves and the cooperating guide piece are V shaped.

5. The structure defined in claim 3 wherein the guide grooves and the cooperating guide piece are V shaped, the V being of 90 degree included angle or greater.

6. The structure defined in claim 3 wherein the clamps are bolts extending vertically thru the board in the margin between the panel and the space enclosed by the guide grooves, the toes are L shaped ends at the upper ends of the bolts extending laterally from the bolt holes thru grooves in the top surface of the board over the panel, and the operating means are nuts below the board on the bolts.

7. The structure defined in claim 3 in combination with a drawing stand having pivoting means for turning the board on an axis at right angles to the plane of the board.

FREDERICK W. COTTERMAN.