Sept. 15, 1959 J. C. BLECHA 2,903,920

DEVICE FOR DETERMINING THE LOCATION AND ANGLE OF DOWEL-RECEIVING HOLES IN FURNITURE AND CABINET CONSTRUCTION

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FIG. 1.

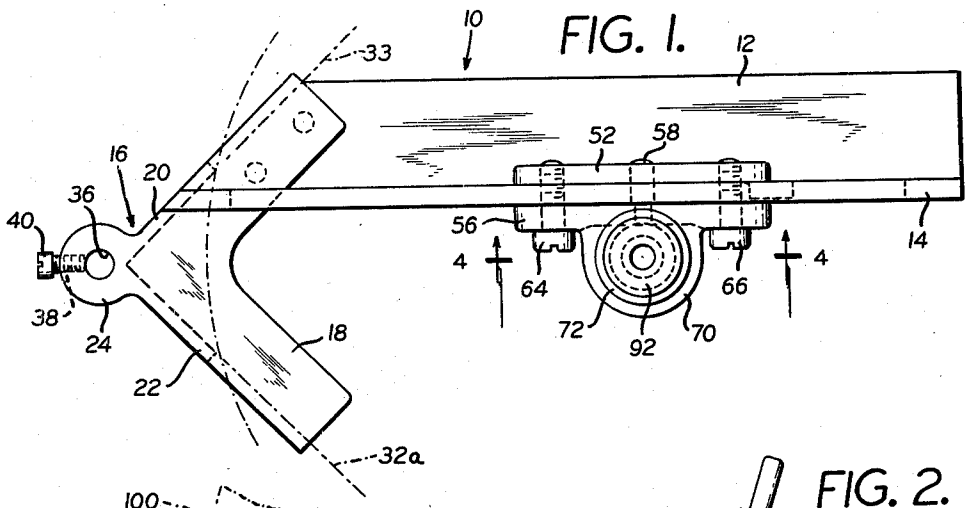



FIG. 2.

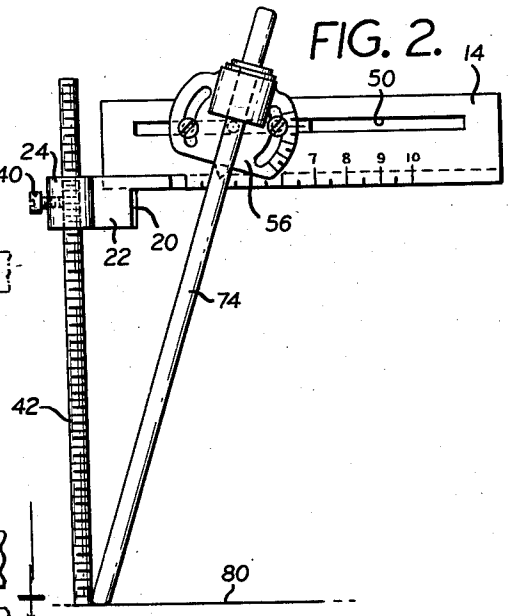



FIG. 3.

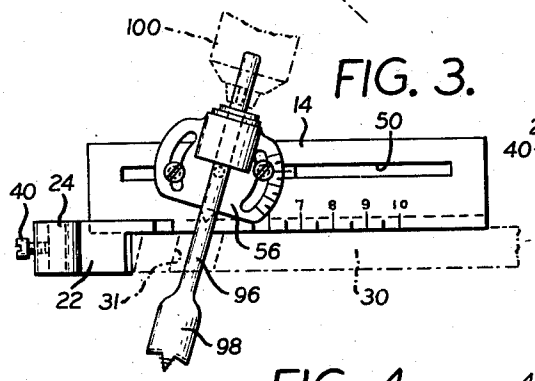



FIG. 4.

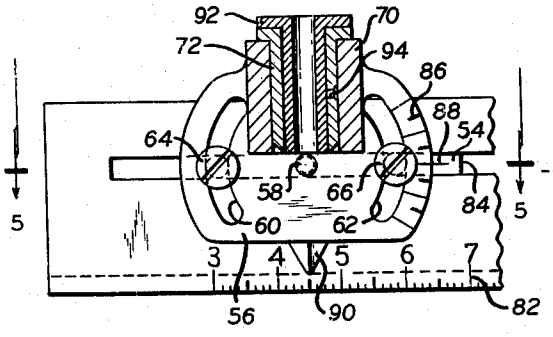



FIG. 5.

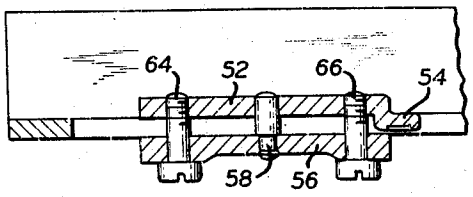
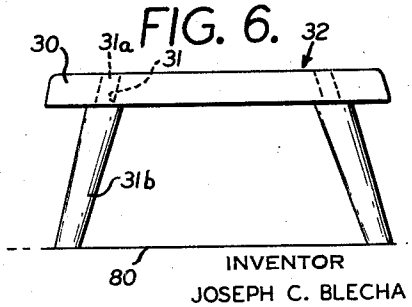



FIG. 6.




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# DEVICE FOR DETERMINING THE LOCATION AND ANGLE OF DOWEL-RECEIVING HOLES IN FURNITURE AND CABINET CONSTRUCTION

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1 Claim. (Cl. 77—62)

This invention relates to a device for determining the location and angle of dowel-receiving holes in furniture and cabinet construction and the like.

The invention will be described in terms of its application to the construction of an article of furniture, such as a stool or bench, but this is purely for purposes of illustration and should not be construed as limiting the scope of application of the invention.

In the construction of a stool or bench of the general style and character illustrated in the drawing, it becomes necessary to attach the legs to the seat at predetermined or selected angles and at predetermined or selected locations. Certain designs or styles would require that the legs be disposed at more acute angles relative to the seat and other designs or styles might require a less acute angle between the legs and the seat. This is not only a matter of style but also of preference. Another problem is the location of the legs relative to the seat since in some cases it may be desired that the seat project beyond the lower ends of the legs while in other cases it may be desired that the lower ends of the legs project beyond the outermost limits of the seat and in still other cases it may be preferred that the lower ends of the legs be disposed directly below the outer peripheral edges of the seat. These variations compounded with the variations in location of where the legs are to be attached to the seat, render it extremely difficult to determine the locations and the angles of the holes which are to be formed in the seat to receive the dowel-ends of the legs.

At the present time two methods are commonly used to determine these locations and angles. One method is employed by established manufacturers of these articles of furniture and it consists simply in laying out the design on paper and then transferring the design to the work by means of suitable jigs, fixtures and other tools. The second method is generally employed by home craftsmen and this method may best be described as "trial and error."

The principal object of this invention is the provision of a tool which may be used by home craftsmen and others, in the place and stead of jigs, fixtures and the like, to determine both the location and the angle of these dowel-receiving holes.

Another object of this invention is the provision of a tool of the character described which not only determines the location and angle of dowel-receiving holes but also provides means for drilling such holes at the location and angle thus determined.

Briefly stated, the invention comprises a gauge element which may be placed on the seat of a stool or bench under construction, at a peripheral edge thereof, a vertical rod adjustably supported by said gauge element for vertical adjustment thereon in either direction, a slide mounted on said gauge element for adjustment in a horizontal path toward and away from said vertical rod, said slide being also adapted to pivot or swivel about a horizontal axis transverse of said horizontal path of movement, a sleeve



or bushing mounted on said slide for integral movement therewith, and a second rod slidably mounted in said sleeve or bushing for movement in either direction axially of itself and of said sleeve or bushing.

In the operation of this device, the vertical rod is adjusted to correspond in length, from the level of the top surface of said seat, to the overall height of the projected stool or bench. The second rod is then adjusted, both relative to the bushing and by means of the slide relative to the gauge element, so that its lower end abuts the lower end of the vertical rod while its longitudinal axis is disposed at a selected angle relative to said vertical rod.

Variations in the foregoing procedure may be had in order to produce different results. For example, the position of the lower end of the second rod relative to the lower end of the vertical rod may be varied, depending upon the desired location of the lower ends of the legs of the projected stool or bench. For example, it may be desired that the legs project at their lower ends beyond the outer peripheral edges of the seat of said stool or bench or, alternatively, it may be desired that they fall short of the outer limits of the seat. These variations and others may be achieved by simple adjustment of the device herein described and claimed.

In the use of this device to drill holes in accordance with its setting, the second rod is withdrawn from the bushing and a drill bit is inserted in its place. Preferably, the drill bit is driven by a conventional portable power drill. The device is placed on the seat of the proposed or projected stool or bench and the drill is used to bore a hole adapted to receive the dowel of one of the legs. This procedure is repeated at all of the corners of said seat or wherever it is desired to attach the legs.

An important feature of this invention is the fact that it is fully calibrated so that each setting may be recorded for future use. Thus, the vertical rod is calibrated as to height; the slide is calibrated as to its angular position relative to said vertical rod; and said slide is also calibrated—more particularly the gauge element carries the calibrations—for horizontal adjustment relative to said vertical rod.

The invention is illustrated in the accompanying drawing in which:

Fig. 1 is a plan view of a device made in accordance with this invention.

Fig. 2 is a side view thereof.

Fig. 3 is a fragmentary side view similar to that of Fig. 2 but showing a drill bit substituted for the second adjustable rod.

Fig. 4 is a fragmentary sectional view on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary sectional view on the line 5—5 of Fig. 4.

Fig. 6 is a side view of a stool or bench constructed with the aid of the device shown in the first five figures of the drawing.

Referring now to the drawing, it will be observed that the device herein claimed includes a gauge element or jig **10** consisting of a flat, horizontally disposed bar **12**, a vertically extending flange **14** extending upwardly from said bar along one side edge thereof, a corner element **16** which is connected to one end of said bar **12**, said corner element including a horizontally disposed generally V-shaped plate **18** and a pair of downwardly projecting flanges **20** and **22** joined to each other at an angle of approximately 90 degrees and connected to said plate, and a boss **24** connected to said flanges **20** and **22** at their point of juncture.

As has already been indicated, in the use of this device gauge member or jig **10** is placed on a board which is projected to become seat **30** of stool or bench **32**. As-

suming for the moment that said board is of rectangular shape in plan view, said gauge element or jig would be placed at one corner thereof, bar **12** resting on top of said board, and flanges **20** and **22** abutting the side edges of said board on opposite sides of the corner. Interrupted lines **32***a* are intended to represent a rectangular board. It is also possible to apply this device to boards of different shape, such as disc-shaped boards, and interrupted line **33** is intended to represent a board of this shape. When the device is applied to a rectangular board, its flanges **20** and **22** abut the sides of such board. When a circular board is employed, the forward ends of flanges **20** and **22** will abut same as Fig. 1 clearly shows. In short, corner element **16** is a jig which is adapted to center itself on boards of various shapes. The procedure above outlined is to be followed with respect to each corner of a rectangular board or at equally spaced intervals on a circular board. These board shapes are mentioned purely by way of illustration.

A vertically extending hole **36** is formed in boss **24**. A tapped hole **38** in said boss receives a set screw **40** which is adjustable therein on an axis perpendicular to the axis of hole **36**. A calibrated rod **42** is inserted into hole **36** and set screw **40** is adapted to engage said rod and to hold it in any selected position therein. Since hole **36** is disposed on a vertical axis when bar **12** lies in a horizontal plane, calibrated rod **42** will normally be disposed with its longitudinal axis extending vertically and it will hereinafter be designated as the vertical rod of the device. Although rod **42** is shown to be calibrated an uncalibrated rod may also be used, for example, a quarter-inch wood dowel. It is therefore preferred that hole **36** be made of a diameter adapted to receive a quarter-inch dowel with a sliding fit.

It will be observed that an elongated slot **50** is formed in flange **14**, longitudinally thereof. Behind flange **14**, as viewed in Fig. 2, is a plate **52** having a forwardly and outwardly extending lug portion **54** which projects into slot **50**. A second plate **56** is provided in front of flange **14** as viewed in Fig. 2 and a bolt or rivet **58**, extending through slot **50**, connects said front plate **56** to said back plate **52**. It will also be noted that front plate **56** is provided with a pair of arcuate slots **60** and **62** which are arranged concentrically with bolt or rivet **58**. A pair of clamp screws **64** and **66** extend through arcuate slots **60** and **62**, their heads engaging front plate **56**, and their threaded shanks engaging back plate **52**. These screws serve to clamp the front and back plates to flange **14** of the gauge or jig element **10**. When these screws are loosened thereon, said plates **52** and **56** are free to slide longitudinally of flange **14** and, in addition, front plate **56** is also adapted to pivot or swivel about bolt or rivet **58**. It will be understood that front plate **56** and the components mounted thereon constitute what has hereinabove been designated the slide element of the present device.

Mounted on front plate or slide **56** is a sleeve **70** and removably mounted in said sleeve is a bushing **72**. This bushing is provided, preferably, with a quarter-inch hole adapted to receive a conventional quarter-inch dowel **74**. There should be a fairly close fit between the dowel and the bushing so that the dowel will hold any position therein which it is made to occupy but at the same time it should be possible to move the dowel to any other selected position.

Fig. 2 shows how the present device is used to determine the location and angle of a hole **31** to be formed in a board or seat **30** to receive the dowel end **31***a* of leg **31***b* of stool or bench **32**. Gauge or jig element **10** is placed on the board or seat **30** in the manner above described and vertical rod **42** is then extended below said board or seat **30** to a length corresponding to the projected height of said board or seat above the floor **80**. Slide **56** is then moved horizontally along slot **50** and angularly about bolt or rivet **58** to a selected position on flange **14** and it is then clamped in place on said flange. One way of determining the position of said slide is simply to project dowel **74** downwardly upon said slide until its lower end abuts the lower end of vertical rod **42**, as shown in Fig. 2. Slide **56** may then be moved horizontally along slot **50** until dowel **74** is brought to a desired angle relative to vertical rod **42** and the slide may then be clamped in place in that position.

The several parts involved in the last described operation may be calibrated so that particular settings may be recorded and then subsequently used without the aid of vertical rod **42** and dowel **74**. Thus, calibrations **82** may be provided on flange **14** and edge **84** of lug **54** may be used as an indicator relative to said calibrations. It will be understood at this point that lug **54** rides in slot **50** to help prevent angular movement of back plate **52**. Screws **64** and **66** and bolt or rivet **58** also contribute to this end. But in addition to preventing such angular movement of the back plate, lug **54** and especially its far end **84**, serves as an indicator relative to calibrations **82** to locate slide **56** on flange **14**. In addition to the foregoing, calibrations **86** are provided on slide **56** in concentric relation to arcuate slot **62**. An indicator **88** is provided on lug **54** opposite said calibrations **86** and it thereby becomes possible to adjust the angular position of said slide **56** about bolt or rivet **58** by reference to said calibrations **86** and said indicator **88**.

It may be desired on occasion to position slide **56** with its sleeve **70** and bushing **72** disposed vertically, that is, with their common longitudinal axis disposed in a vertical line. A second indicator element **90** may accordingly be provided to assure such alignment, said indicator **90** being connected to slide **56** and cooperating with calibrations **82**. Indicator **90** is auxiliary to indicating edge **84** in this regard.

Since the ultimate purpose of the present device is to drill holes in a board of seat **30**, the method in which this may be done and the means to be used in connection therewith will now be described. Dowel **74** is removed from bushing **72** and a second bushing **92** is inserted in its place. This second bushing **92** is a relatively thin-walled member and it serves as a spacer in addition to serving as a bushing as will shortly appear. A set screw **94** in outer bushing **72** engages inner bushing **92** and holds the latter in place in the former. The shank **96** of a drill bit **98** may now be inserted into the inner bushing **92**. It will now be understood that drill bit **98** is provided with a standard size shank suitable for use in connection with a conventional power drill **100** having a quarter-inch chuck. The diameter of shank **96** is somewhat smaller than that of a conventional quarter-inch wood dowel **74** and consequently it becomes necessary to provide a spacer in bushing **72** to compensate for the difference in diameter between said dowel **74** and said shank **96**. Bushing **92** is not required when the diameters of shank **96** and dowel **74** are the same.

Once the present device is set in the manner above described, drill **98** may be placed thereon in the manner shown in Fig. 3 so as to drill hole **31** in board or seat **30**.

The foregoing is illustrative of a preferred form of this invention and it will be understood that this preferred form may be modified and that other forms may be provided within the broad spirit of the invention and the broad scope of the claim.

I claim:

A device for determining the location and angle of dowel-receiving holes in furniture and cabinet construction and the like, comprising a jig which is adapted to be placed on a horizontal component of an article of furniture or the like and against a vertical edge of said component, a sleeve connected to said jig with its longitudinal axis disposed in a vertical line, a first rod adjustably mounted in said sleeve for vertical adjustment there-

in, a slide mounted on said jig for horizontal adjustment thereon toward and away from said sleeve, said slide being also angularly adjustable about a horizontal axis which is transverse of the horizontal path of movement of said slide, a bushing mounted on said slide, and a second rod adjustably mounted in said bushing for longitudinal adjustment therein in either direction, said jig being provided with a horizontal component which is adapted to rest upon said horizontal component of an article of furniture, and a vertical component which is adapted to engage a vertical edge of said horizontal component of said article of furniture, the vertical component of said jig comprising a pair of vertically disposed flanges which meet at an angle of approximately 90 degrees.



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