Sept. 20, 1966 J. L. CLEVELAND 3,273,426

DRILLING JIG

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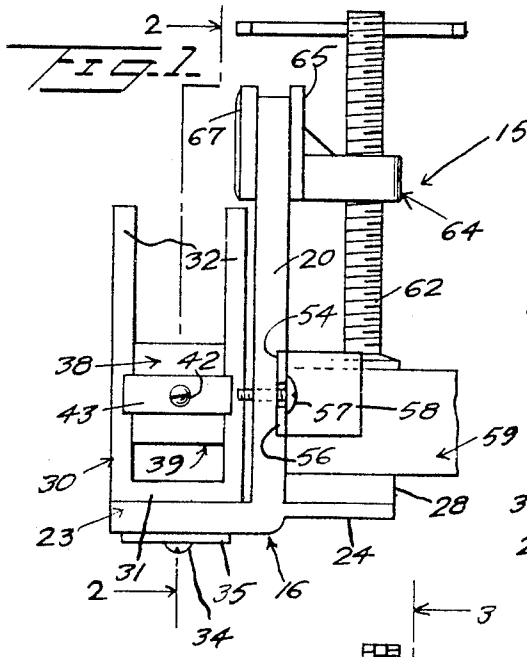


FIG. 1

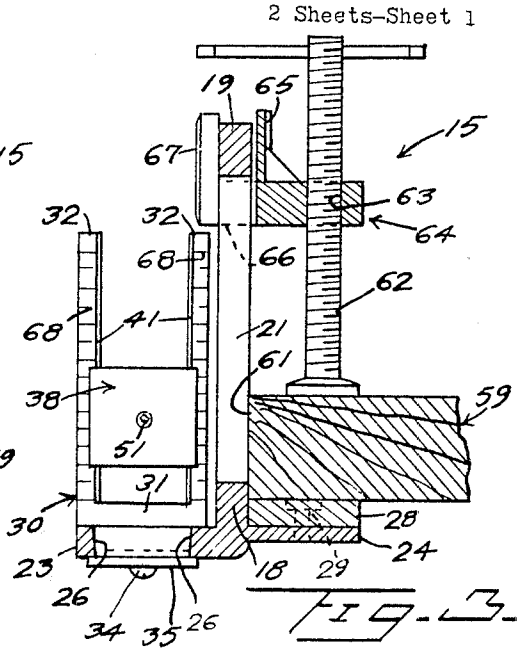


FIG. 3

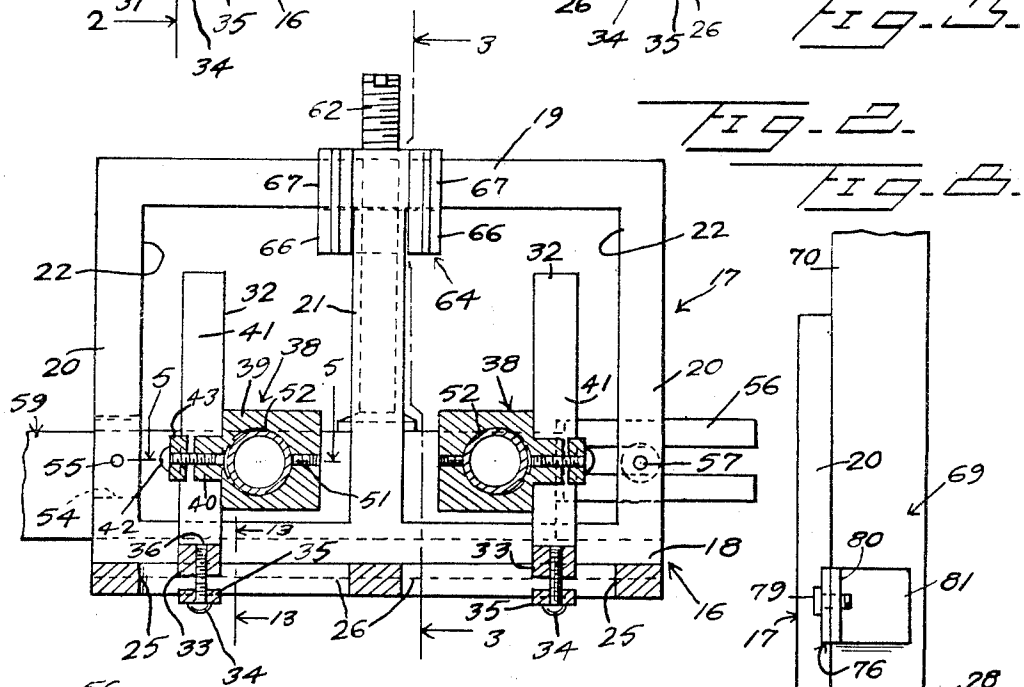


FIG. 2

FIG. 4

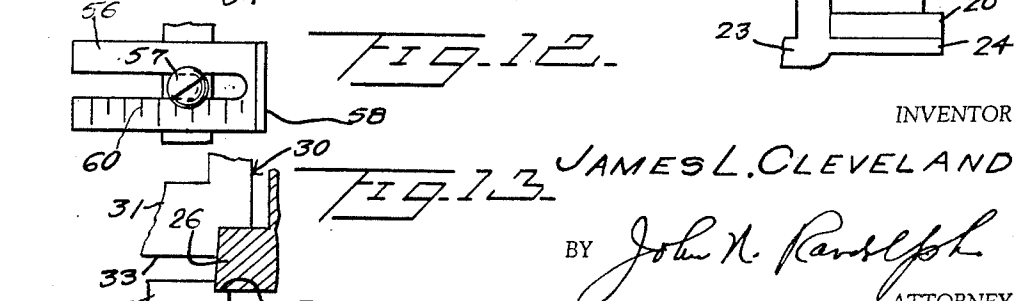


FIG. 12

FIG. 13

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FIG. 4

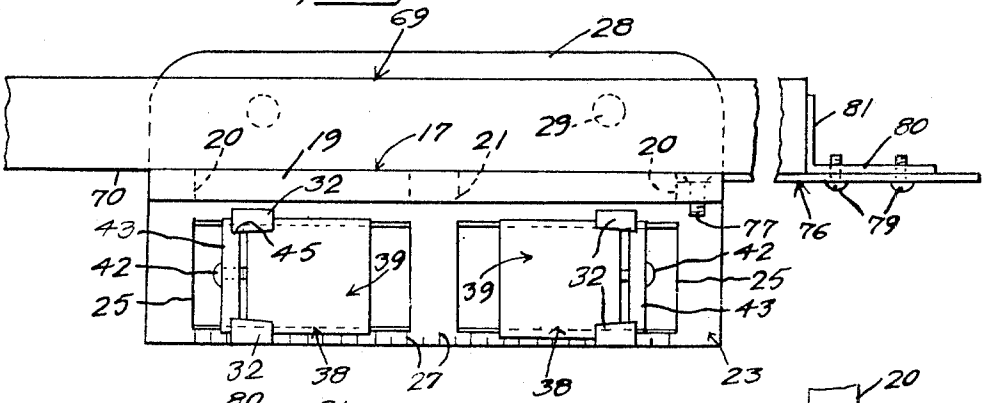


FIG. 9

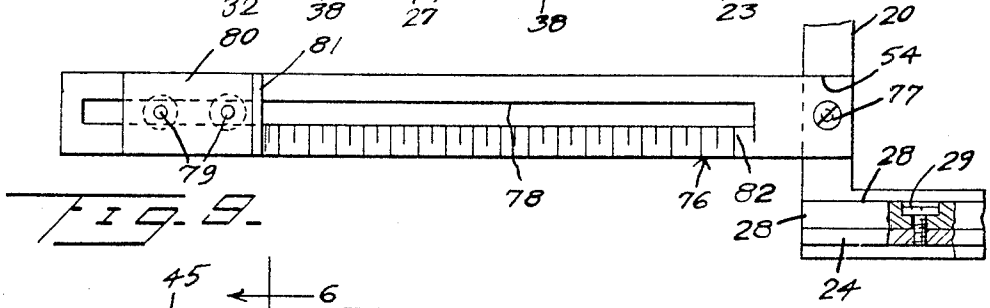


FIG. 5

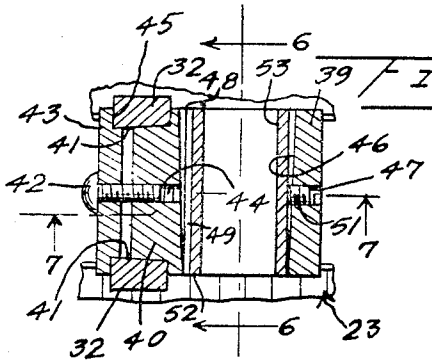


FIG. 6

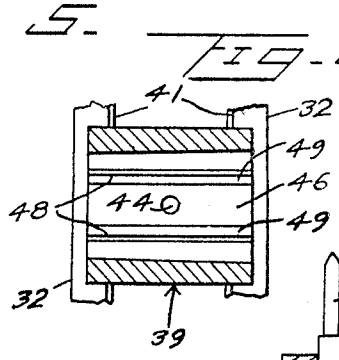


FIG. 7

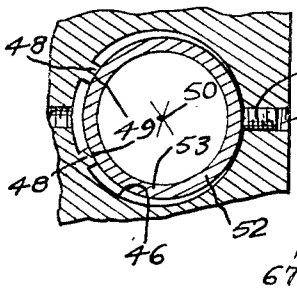


FIG. 11

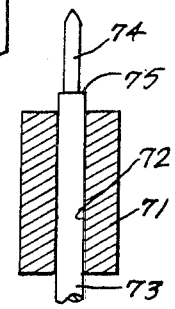
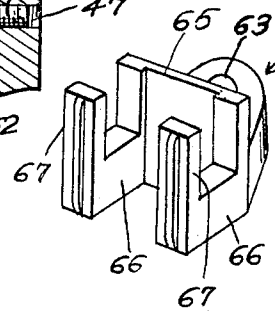


FIG. 10



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3,273,426

DRILLING JIG

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Filed Dec. 16, 1963, Ser. No. 330,778
6 Claims. (Cl. 77—62)

This invention relates to a novel drilling jig primarily intended for drilling dowel holes in parts forming window sashes and doors, and so that dowel holes can be accurately drilled at correct distances from an end of the piece engaged by the jig and at correct and desired intervals relative to one another.

Another object of the invention is to provide a drilling jig which may be utilized for accurately locating holes to be drilled to receive fastenings for attaching latches and hinges to doors and the like, especially in connection with cabinet work.

More particularly, it is an object of the present invention to provide a drilling jig for accomplishing all of the functions as set forth in my prior U.S. Patent No. 3,019,675, issued February 6, 1962, entitled Dowel Hole Drilling Jig, and which in addition can be utilized more expeditiously in accomplishing the various functions of the jig, primarily due to the fact that relocation of the drilling guides is not required with the present invention when utilized for drilling fastening receiving openings for hinges and latches rather than dowel holes.

Another object of the invention is to provide an improved drilling jig certain of the parts of which have been reconstructed to facilitate manufacture thereof.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

FIGURE 1 is an end elevational view of the improved drilling jig;

FIGURE 2 is a longitudinal sectional view thereof taken substantially along the line 2—2 of FIGURE 1;

FIGURE 3 is a cross sectional view of the drilling jig, taken substantially along the line 3—3 of FIGURE 2;

FIGURE 4 is a top plan view of the drilling jig with certain of the parts omitted;

FIGURE 5 is an enlaged fragmentary sectional view taken substantially along a plane as indicated by the line 5—5 of FIGURE 2;

FIGURE 6 is a fragmentary sectional view taken substantially along a plane as indicated by the line 6—6 of FIGURE 5;

FIGURE 7 is an enlarged fragmentary cross sectional view, taken substantially along the line 7—7 of FIGURE 5;

FIGURE 8 is a fragmentary end elevational view looking from right to left of FIGURE 4;

FIGURE 9 is a fragmentary front elevational view, partly in section, looking from right to left of FIGURE 8, with the work piece omitted;

FIGURE 10 is a perspective view of one element of the jig;

FIGURE 11 is a view partly in section and partly in elevation showing another drilling bit guide and a drilling bit for use therewith;

FIGURE 12 is a fragmentary front elevational view similar to FIGURE 9 but looking from right to left of FIGURE 1, and

FIGURE 13 is a fragmentary sectional view taken substantially along a plane as indicated by the line 13—13 of FIGURE 2.

Referring more specifically to the drawings, the drilling jig in its entirety and comprising the invention is designated generally 15 and includes a frame, designated generally 16. The frame 16 includes a wall 17 composed

of a bottom bar 18, a top bar 19, corresponding end bars 20, and an intermediate bar 21. The bars 20 and 21 extend between and merge at their ends with the bars 18 and 19, and the intermediate bar 21 is disposed between and equally spaced from the end bars 20 and combines therewith and with said bars 18 and 19 to form two large openings 22 in the wall 17.

The frame 16 includes a flange 23 which extends transversely from one side of the bar 18, and a ledge 24 which extends transversely from the other side of said bar 18. The flange 23 and ledge 24 are disposed at right angles to the plane of the wall 17. As best seen in FIGURES 2 and 4, the flange 23 has two longitudinally spaced elongated openings 25 each of which extends longitudinally thereof. The openings 25 are approximately coextensive with the openings 22. The openings 25 have side walls which slope downwardly and inwardly relative to one another, as seen at 26 in FIGURES 3 and 13; and the upper surface of the outer portion of the flange 23 is inscribed with graduations 27, forming a linear scale. A plate 28 covers the upper surface of the ledge 24 and is detachably secured thereto by countersunk screw fastenings 29, as seen in FIGURE 9. The flange 23, ledge 24, and plate 28 each extends from end-to-end of the frame 16.

Two corresponding drilling guide supports, each designated generally 30 are adjustably and detachably mounted on the flange 23 and each includes a base portion 31 and two transversely spaced uprights 32 which rise from said base portion. The supports 30 are disposed in planes crosswise of the flange 23 and the base portions 31 have depending extensions 33 which extend downwardly into the openings 25 and which are of length to extend across said openings. The ends of the extensions 33 converge downwardly relative to one another, as seen in FIGURE 13, to conformably engage the surfaces 26 when the undersides of the end portions of the bases 31, which are disposed beyond the ends of the extensions 33, are resting upon the upper surface of the flange 23. A screw 34 extends upwardly through an anchor bar 35 and into a threaded bore 36 of each base 31. The bars 35 spans the opening 25 and has notched ends 37, as seen in FIGURE 13, which interengage with the side edges 26 to prevent turning of the bar 35 relative to the flange 23 to insure an effective clamping of the support 30 in an upright position on the flange 23, when the fastening 34 is tightened.

A drilling guide 38 is adjustably mounted on each support 30 and includes an elongated block 39 having a projection 40 which fits snugly between the uprights 32 of the support 30 on which said drilling guide is mounted. The adjacent opposed sides 41 of each pair of uprights 32 converge relative to one another from the inner to the outer sides of said uprights, as seen in FIGURES 3 and 5, and the ends of the projection 40 are inclined to fit snugly between said sides 41, as seen in FIGURE 5, when the ends of the block 39 are in abutting engagement with the uprights 32. A headed screw fastening 42 extends through an anchor bar 43 and into a threaded bore 44 of the projection 40 for anchoring the block 39 to the uprights 32. The bar 43 has notched ends 45, corresponding to the notched ends 37, for engaging two sides of the uprights 32 to prevent the bar 43 from turning relative to the support 30 when the screw 42 is tightened.

The block 39 has a bore 46 extending from end-to-end therethrough and which is tapered from end-to-end thereof. The block 39 has a threaded bore 47 which is disposed substantially in alignment with the bore 44 and which opens outwardly of the side of the block located remote from the projection 40 and into the bore 46. The bore 46 contains two ribs 48 which are disposed above and beneath the bore 44 and thus nearly opposite to the

bore 47. The inner faces 49 of the ribs 48 are disposed concentric to the axis 50. Thus, the radial thickness of the ribs 48 diminishes toward the restricted end of the bore 46. An Allen-type setscrew 51 threadedly engages the bore 47. With this setscrew retracted, a drill bit guide sleeve 52 is inserted into the bore 46 from its enlarged end toward its restricted end, and when fully applied, as seen in FIGURE 5, the setscrew 51 is tightened to move the guide sleeve 52 laterally so that peripheral portions thereof will contact the surfaces 49 of the ribs 48 for supporting the guide sleeve immovably in the bore 46 between the inner end of the setscrew 51 and the surfaces 49, so that the axis of the bore 53 of the sleeve 52 will be disposed parallel to the axis 50 of the bore 46. From the foregoing it will be readily apparent that the two guide sleeves 52 may be moved toward and away from one another by longitudinally adjusting the supports 30 relative to the flange 23, and said guide sleeves 52 may be adjusted toward and away from the flange 23 by adjustment of the blocks 39 longitudinally of the uprights 32, for thus adjusting the two guides 38 in two directions at right angles to one another relative to the frame 16.

The end uprights 20 are each provided with a recess 54, as seen in FIGURE 1, and a threaded bore 55 which extends through the upright and which opens into the recess 54. A longitudinally slotted gauge bar 56 is shown in FIGURES 1, 2 and 12 engaging the recess 54 of one upright 20. A headed screw fastening 57 extends through the slot of the gauge bar 56 and threadedly engages the bore 55 of said recess 54 for adjustably clamping the bar 56 to said upright 20. The inner end of the bar 56 has an outturned unslotted extension 58 which extends away from the wall 17 over the plate 28 to form an abutment against which is positioned an end of a piece of material 59 to be drilled. The gauge bar 56 can obviously be adjusted longitudinally of the frame 16 for varying the position of the end of the piece 59 which engages the abutment 58. The gauge bar 56 has graduations thereon forming a linear scale 60 to be utilized in setting the gauge bar abutment 58, as seen in FIGURE 12. One face of the material 59 rests upon the plate 28 and an edge 61 of the material 59 abuts the wall 17, as seen in FIGURE 3. A clamping screw 62 bears against an opposite face of the material 59 for clamping the material to the jig 15 between the plate 28 and the screw 62.

The screw 62 extends threadedly through a bore 63 formed in one end of a bracket 64 which is provided with an upstanding wall 65 which is disposed midway of its ends and transversely thereof. The other end of the bracket 64 is bifurcated to form furcations 66 which straddle the intermediate upright 21. The furcations 66 have upstanding extensions 67 which are spaced from the wall 65 and each of which combines with a part of said wall to form upwardly projecting furcations which straddle the top bar 19. Thus, when the clamping screw 62 is in clamping engagement with a work piece, as seen in FIGURES 1, 2 and 3, it functions to hold the bracket 64 anchored to the wall 17 and immovable relative thereto, since the wall portions 19 and 21 fit relatively snug between the parts of the brackets straddled thereby.

With the work piece 59 thus clamped in the jig 15 and with the drilling guides 38 correctly adjusted both horizontally and vertically of the frame 16, drilling bits, not shown, may operate in the bores 53 for drilling two dowel holes in the piece 59 spaced desired distances from the opposite faces of said piece, from one another, and from the end of the piece engaging the abutment 58. It will also be apparent that when the jig 15 has been properly set any number of corresponding pieces 59 may be clamped thereto and drilled without resetting the drilling guides 38 or the abutment 58. The inner faces of the uprights 32 are provided with graduations forming linear scales 68 to facilitate the vertical adjustments of the drilling guides 38.

The drilling jig 15 may also be utilized for drilling holes in the face of a piece of material to receive fastenings for attaching hinges or latches. This can be accomplished without removing the drilling guides 38 from the supports 30 or the supports 30 from the flange 23, since when the clamping screw 62 is disengaged from the material 59 the bracket 64 can be displaced downwardly and to the right relative to its position of FIGURE 3 and thereby detached from the frame 16, so that an edge of another piece of material 69, such as a cabinet door, may be rested on the plate 28 with a face 70 of the material abutting the wall 17, as seen in FIGURE 8. Normally in drilling fastening openings for latches and hinges, a guide sleeve 71, as shown in FIGURE 11, is substituted for each of the guide sleeves 52. The guide sleeve 71 has a smaller bore 72 for receiving a smaller drilling bit 73 which has a restricted leading end 74 defining an annular shoulder 75 which limits the depth that the end 74 can penetrate the surface 70.

Ordinarily, when the drilling jig is utilized without the bracket 64 and clamping screw 62 a different gauge bar as shown in FIGURES 4, 8 and 9 is employed, since the material is normally drilled further from an end thereof. As best seen in FIGURE 9, the substituted gauge bar 76 is positioned with an end thereof in one of the recesses 54 and secured thereto by a headed screw 77 which engages the bore 55 of said recess. The bar 76 extends outwardly from the end of the wall 17 on which it is mounted and is provided with a longitudinal slot 78 for receiving the shanks of two headed fastenings 79 which attach a slide 80 to the front side of the bar 76. The slide 80 has an outturned inner end 81 forming an abutment which is engaged by an end of the material piece 69, as seen in FIGURE 4, and which may be secured in different longitudinally adjusted positions relative to the bar 76 by tightening the screws 79. The front face of the bar 76 has graduations forming a linear scale 82.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A drilling jig comprising a frame, a drilling guide support, means adjustably mounting said support on a first part of said frame, a drilling guide, means adjustably mounting the drilling guide on said support, a bracket detachably anchored to a second part of the frame, and a clamping screw engaging threadedly through said bracket and adapted to clamp a piece of material against a third part of the frame and with a surface of the material facing said drilling guide, said clamping screw, when in clamping engagement with the material, maintaining said bracket anchored to said second part of the frame, said second part of the frame including a top portion and a depending portion, said bracket having a first bifurcated portion straddling said depending portion and a second bifurcated portion engaging under and straddling said top portion.

2. A drilling jig comprising a frame, a drilling guide support, means adjustably mounting said support on a first part of said frame, a drilling guide, means adjustably mounting the drilling guide on said support, a bracket detachably anchored to a second part of the frame, and a clamping screw engaging threadedly through said bracket and adapted to clamp a piece of material against a third part of the frame and with a surface of the material facing said drilling guide, said clamping screw, when in clamping engagement with the material, maintaining said bracket anchored to said second part of the frame, said bracket including an elongated body, said clamping screw engaging threadedly through said body adjacent one end thereof, the other end of said body having bifurcated portions disposed at a right angle to one another and

embracing angularly disposed portions of said second part of the frame, one of said bifurcated portions opening in a direction away from said third part of the frame.

3. A drilling jig comprising a frame, a drilling guide support, means adjustably mounting said support on a first part of said frame, a drilling guide, means adjustably mounting the drilling guide on said support, a bracket detachably anchored to a second part of the frame, and a clamping screw engaging threadedly through said bracket and adapted to clamp a piece of material against a third part of the frame and with a surface of the material facing said drilling guide, said clamping screw, when in clamping engagement with the material, maintaining said bracket anchored to said second part of the frame, said bracket having portions engaging said second frame part for holding the bracket against movement away from said third frame part or lengthwise of the third frame part when the clamping screw is in an advanced clamping position.

4. A drilling jig comprising a frame, a drilling guide support, means adjustably mounting said support on a first part of said frame, a drilling guide, means adjustably mounting the drilling guide on said support, a bracket detachably anchored to a second part of the frame, and a clamping screw engaging threadedly through said bracket and adapted to clamp a piece of material against a third part of the frame and with a surface of the material facing said drilling guide, said clamping screw, when in clamping engagement with the material, maintaining said bracket anchored to said second part of the frame, said drilling guide comprising a block having a bore extending longitudinally therethrough, said second means cooperating with said drilling guide support for positioning the block with the axis thereof perpendicular to said surface of the material, and a drill bit receiving sleeve detachably

mounted in the bore of said block, the bore of said block being tapered from end-to-end thereof, the exterior of said sleeve being of uniform diameter from end-to-end thereof, and means for clamping the sleeve in the bore of the block with the axis of the sleeve disposed parallel to the axis of said bore.

5. A drilling jig comprising a frame including a first part, a second part and a third part, a drilling guide support mounted on said first part, a drilling guide mounted on said support, a bracket mounted on the second part of the frame, and a clamping screw engaging threadedly through said bracket and adapted to clamp a piece of material against the third part of the frame and with a surface of the material facing said drilling guide, said second part including a portion slidably engaged by the bracket for movement toward and away from said third part and another portion forming an abutment against which the bracket is held immovable by the clamping screw when in clamping engagement with the material.

6. A drilling jig as in claim 5, said drilling guide comprising a block having a tapered bore extending therethrough, the axis of said bore being disposed perpendicular to said surface of the material, a drill bit receiving sleeve of uniform outer diameter from end-to-end thereof mounted in said bore, and means clamping the sleeve in the bore with the axis of the sleeve coinciding with the axis of the bore.

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FRANCIS S. HUSAR, *Primary Examiner.*