

June 7, 1966

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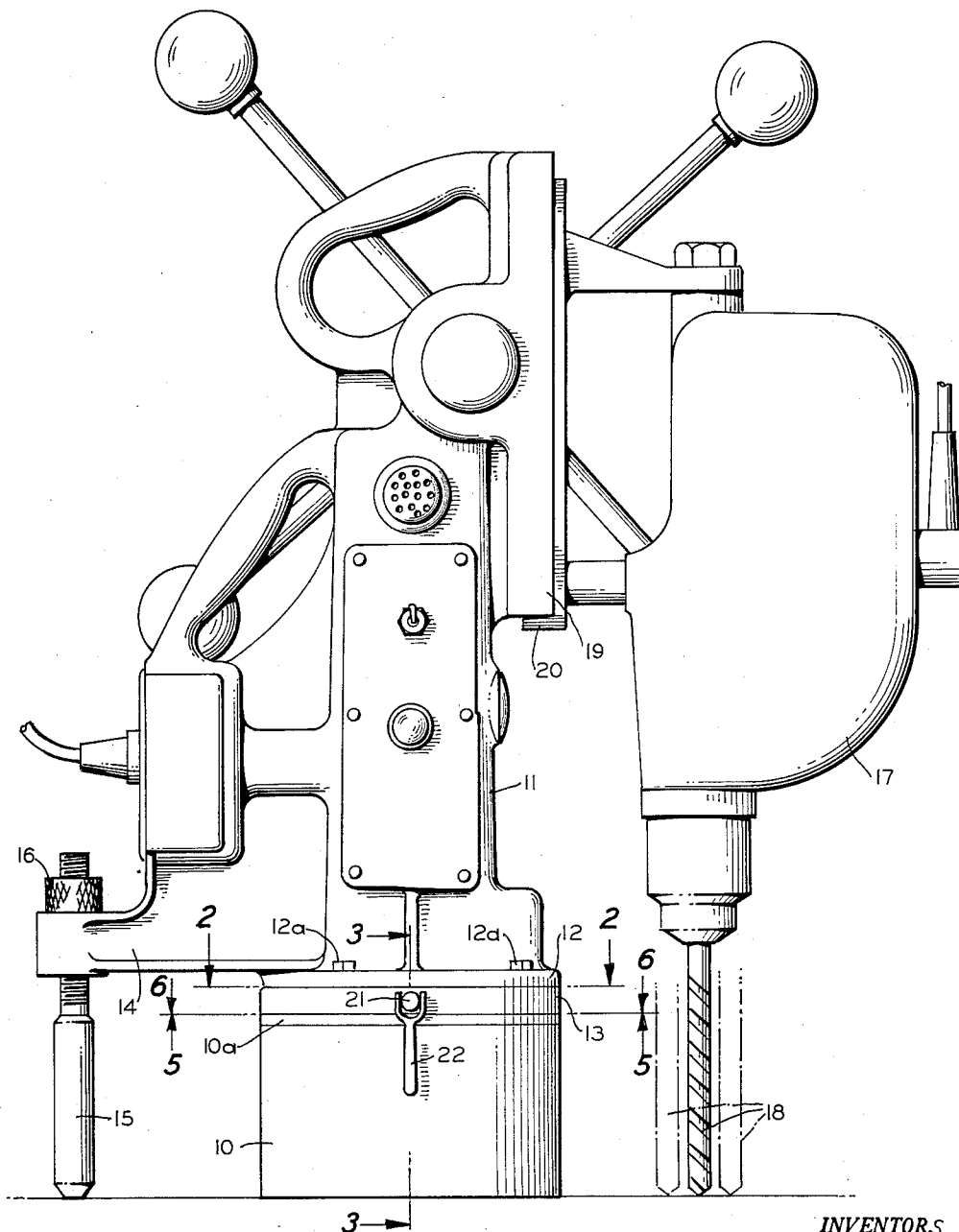
3,254,547

ADJUSTABLE POSITIONERS FOR ELECTRIC DRILLS AND THE LIKE

Original Filed July 21, 1960

3 Sheets-Sheet 1

FIG. 1



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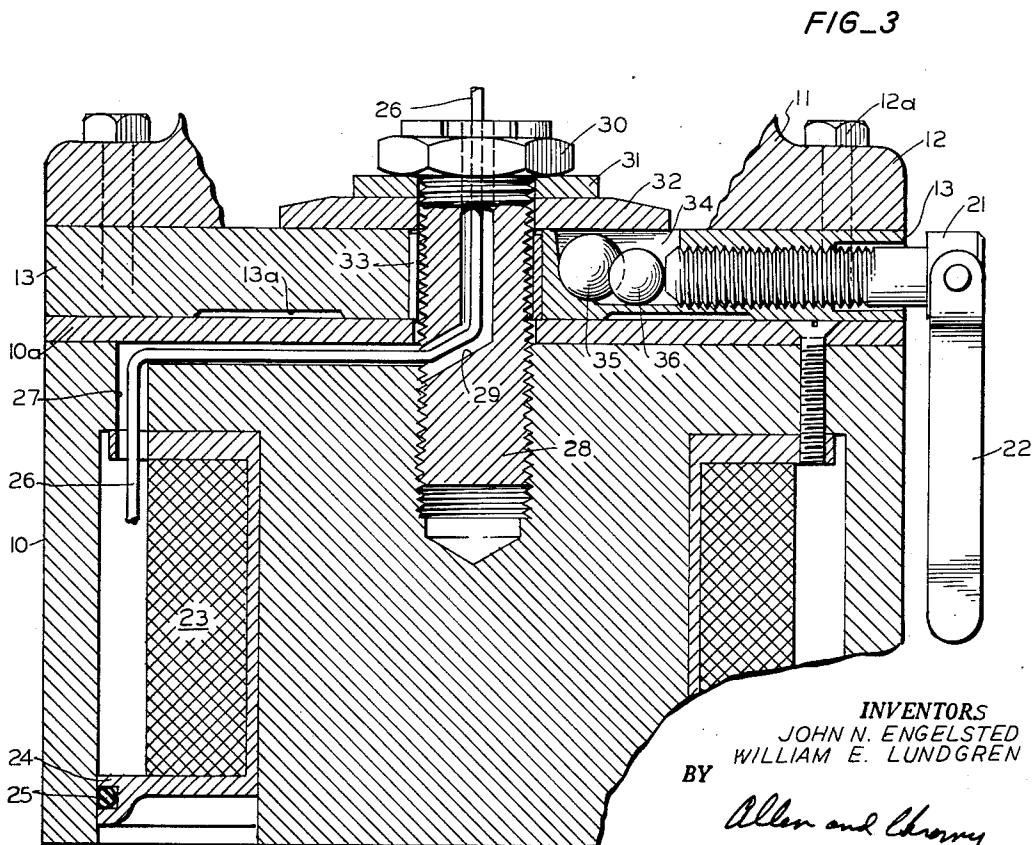
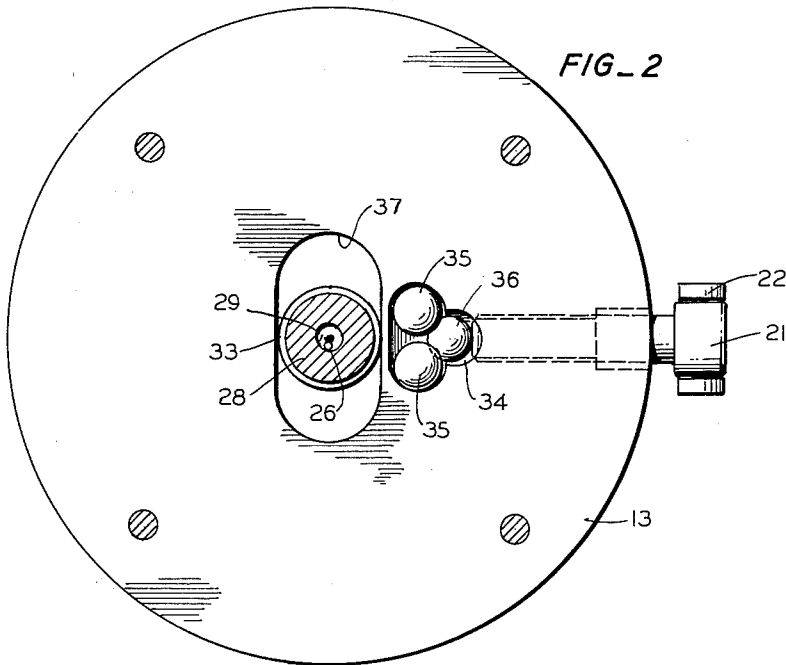
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ADJUSTABLE POSITIONERS FOR ELECTRIC DRILLS AND THE LIKE

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ADJUSTABLE POSITIONERS FOR ELECTRIC DRILLS AND THE LIKE

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3 Sheets-Sheet 3

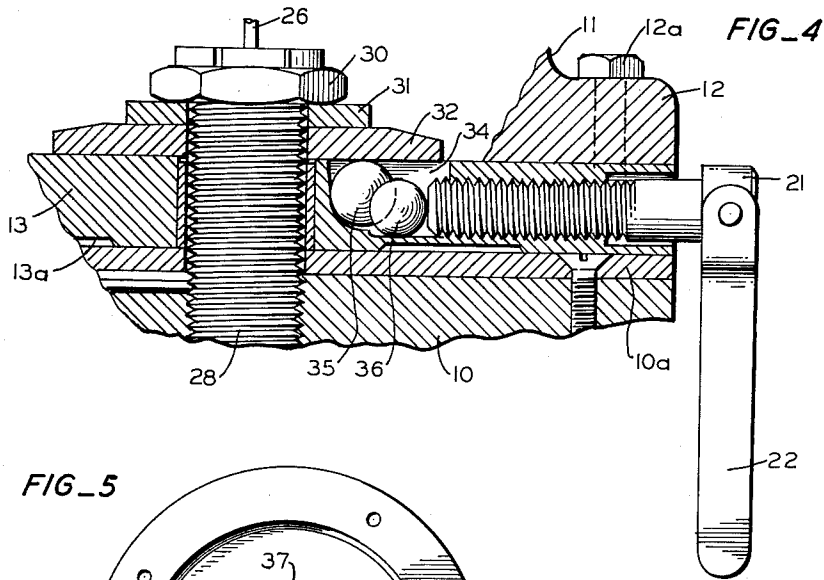


FIG_5

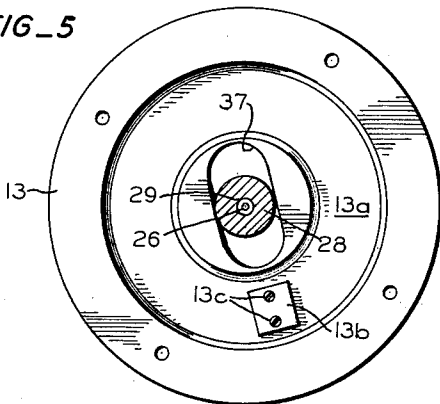


FIG_6

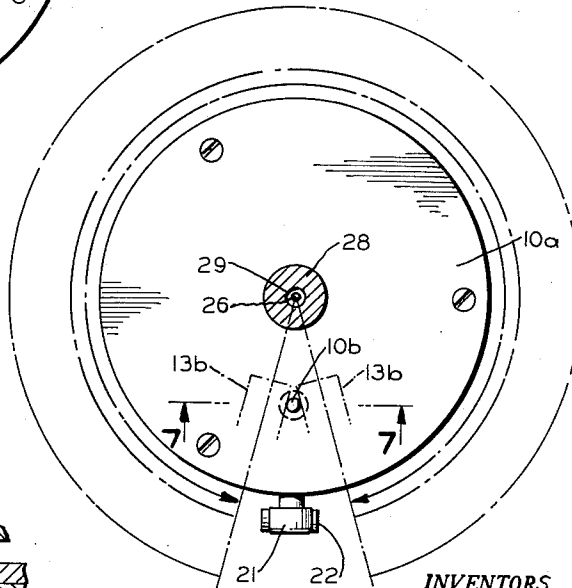
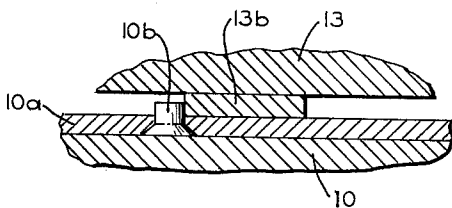


FIG_7



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3,254,547

ADJUSTABLE POSITIONERS FOR ELECTRIC DRILLS AND THE LIKE

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Continuation of abandoned application Ser. No. 44,427, July 21, 1960. This application July 25, 1963, Ser. No. 306,971

7 Claims. (Cl. 77-7)

This application is a continuation of our application Serial No. 44,427, filed July 21, 1960, now abandoned, for Adjustable Positioners for Electric Drills and the Like.

This invention relates to adjustable positioners for use on portable electric drills and the like in general. More particularly this invention relates to an improved adjustable clamping device that is provided to electric drill units equipped with electromagnetic bases.

An object of this invention is to provide an improved positioner for use on electric drills and the like, which is readily applied to electric drills with magnetic bases and is of relatively inexpensive construction and efficient in operation.

Another object of this invention is to provide an improved adjustable positioner which is adapted for use on electric drills and which provides a wide range of positions to which the drill may be adjusted.

Still another object of this invention is to provide an improved adjustable positioner which is adapted for use on electric drills that are provided with magnetic, vacuum or other work surface gripping bases whereby the drill may be shifted to a wide range of different positions after the base grips the work-surface.

Another object of this invention is to provide an improved adjustable positioner to tools such as electric drills that are provided with work-gripping bases, said positioner being provided with a manually operable screw member for engaging one or more steel balls such as ball bearings for pressing one or more of these ball bearings into locking engagement with an opposing member positioned in the base of the tool, thereby securing the tool in a selected position.

Other and further objects of this invention will be apparent to those skilled in the art to which it relates from the following specification, claims and drawings.

In accordance with this invention there is provided an adjustable positioner for tools such as electric drills and the like whereby the position of the cutting element of the tool may be changed to any one of a plurality of different positions after the work surface gripping element provided to the base of the tool is fixed in position.

This adjustable radial positioner is of relatively simple and efficient construction so that it may be readily incorporated in tools of this type. It is provided with a plate member which is attached to the bottom of the drill post and is positioned on the top of the electromagnet structure provided to the base of the apparatus. The electromagnet is provided with a member threaded into the top thereof and extending upward through the aforesaid plate member to provide means for holding a disc or washer in the bottom of the base of the post and above the plate member. A manually adjustable threaded member with the head thereof extending out of the side of the plate member is provided for exerting pressure on a number of ball bearings which are lodged in a suitable cavity formed in the plate member under the disc member thereby forcing certain ones of these ball bearings into engagement with the disc member to lock the drill post in a selected position with respect to the electromagnetic base.

Further details of this invention will be set forth in

the following specification, claims and drawings in which briefly:

FIG. 1 is a side view of an embodiment of this invention;

FIG. 2 is a sectional view taken along the line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken along the line 3-3 of FIG. 1;

FIG. 4 is a fragmentary sectional view of the clamping mechanism;

FIG. 5 is a sectional view taken along the line 5-5 of FIG. 1;

FIG. 6 is a sectional view taken along the line 6-6 of FIG. 1; and

FIG. 7 is a sectional view taken along the line 7-7 of FIG. 6.

Referring to the drawing in detail, there is shown in FIG. 1 a drill mount employing an electromagnetic base 10 for supporting the drill post 11 which may be adjustable in position with respect thereto. The plates 10a and 13 are disposed between the top of the electromagnetic base 10 and the base 12 of the post 11, the plate 10a being attached to the top of the magnet base and the plate 13 being attached by means of the bolts 12a to the base 12. A suitable slide member 19 for receiving the member 20 which is attached to the electric drill 17 is provided for slidably supporting this drill on the forward side of the post 11. The electric drill 17 is provided with a drill bit 18, the position of which may be adjusted, for example to different positions shown in broken lines, by loosening the threaded member 21 which is provided with an actuating handle 22 so that the post 11 may be shifted with respect to the magnetic base 10 as will be described hereinafter.

Suitable frame structure 14 is provided to the back of the post 11 and integral therewith and with the base 12. This frame structure is provided with a hole threaded to receive the threaded upper portion of the bracing and stabilizing member 15. This member may be adjusted with respect to the frame structure 14 so the bottom thereof engages the work surface and braces the mechanism during the drilling operation if necessary. A suitable nut 16 is provided to the upper threaded portion of the member 15 so that this member may be locked in position.

The details of construction of the electromagnetic base are illustrated in FIGS. 2, 3 and 4 to which reference is now made. An electrical winding 23 comprising a plurality of turns of insulated wire on a spool or bobbin 24 is positioned in a cavity of annular shape formed in the base 10 so that the central core member and the circular outer member surrounding the winding form opposite poles of the electromagnet when a suitable electric current is passed through this winding. A suitable rectifier (not shown) is positioned in the post 11 for supplying the required current for energizing this winding.

An O-ring or similar gasket 25 is positioned in a groove formed in the lower flange of the spool 24 whereby sealing contact is provided between this flange and the adjacent surface of the base member. Electrical connections, such as the wire 26 which is preferably insulated, are provided to the winding 23 and these pass through the channel 27 formed in the base and through the channel 29 formed in the bolt 28 which is threaded into a hole formed in the central core member. The bolt 28 extends up through a hole formed in the plate 10a which is attached to the base by means of suitable machine screws or the like. This bolt also passes through an elongated hole 37 formed in the plate 13 and projects up into the hollow base 12 of the post 11. The plate 13 is movable with respect to the bolt 28 when the device is in unclamped condition and a sleeve 33 is provided around the threaded bolt 28. A disc 32 is also positioned around

the bolt 28 and this disc is of sufficient diameter so that it extends substantially across the cavity 34 in which the ball bearings 35 and 36 are positioned. Another disc or washer 31 is positioned over the central part of the disc 32 to strengthen the latter. All of these members are held in assembled relation on the bolt 28 by mean of the nut 30 which is attached to the threaded top portion thereof.

The cavity 34 for the ball bearings 35 and 36 is shaped so that the larger bearings 35 are positioned with the centers thereof somewhat above the center of the smaller bearing 36. The smaller bearing 36 is adapted to be engaged by the inner end of the threaded actuating member 21 so that rotation of this member inward forces the ball bearing 36 against the bearings 35, slightly spreading them and then forcing them upward against the lower surface of the disc 32, thereby forcing the large washer 31 up against the nut 30 and immobilizing the plate 13 and the base of the drill post with respect to the electromagnetic base 10. The cavity 34 may be of a somewhat different shape from that illustrated if it is desired to employ a larger number of ball bearings than that shown so that a larger number of these will engage the bottom surface of the disc 32.

The hole 37 through the plate 13 is of elongated shape so that this plate may be shifted through a substantial distance with respect to the bolt 28 and the magnetic base 10. Thus the plate 13 and the drill post 11 may be shifted with respect to the magnetic base 10 to a distance determined by the length of this hole 37. Also in addition to this movement, the plate 13 and drill post 11 may be rotated with respect to the magnetic base 10 through an angle of approximately 330 degrees as shown in FIG. 6 which is a plan view of the plate 10a and shows the stop member 10b that is adapted to engage opposite sides of the stop member 13b which is attached to the plate 13 in the annular recess 13a formed in the bottom of this plate as illustrated in FIG. 5. Thus the stop 10b fixedly attached to the plate 10a of the electromagnetic base engages the other stop 13b which is fixedly attached to the plate 13 and prevents the plate 13 and drill post 11 from being rotated with respect to the electromagnetic base through a complete revolution. This arrangement is necessary as otherwise the plate 13 and drill post 11 could be rotated with respect to the electromagnetic base until the connecting wires 26 which lead from the electromagnetic base up into the post 11 were twisted and broken. This arrangement enables the use of a rectifier which is positioned in the drill post for supplying rectified alternating current to the winding 23 of the electromagnetic base and it also permits a wide range of adjustments of the drill post with respect to the magnetic base.

While we have shown a preferred embodiment of the invention, it will be understood that the invention is capable of variation and modification from the form shown so that its scope would be limited only by the scope of the claims appended hereto.

We claim:

1. In a radial positioner for a drill mount or the like, a frame structure comprising an upright post having means for supporting a drill bit for vertical adjusting movement with respect thereto, a base structure forming a supporting foot for said frame structure and including gripping means for attaching the base structure to the work surface, a plate member secured to the bottom of said frame structure, said plate member having an elongated opening therein, holding means secured to said gripping means and extending through said elongated opening for adjustably holding said plate member on said gripping means, a plurality of spherical members positioned in a cavity in said plate member, said holding means having a member adapted to extend over said cavity, and actuating means for pressing said selected ones of said spherical members into engagement with

said last-mentioned member and locking said frame structure and said base structure in a selected position with respect to each other.

2. In a radial positioner for a drill mount or the like, a frame structure comprising an upright post having means for supporting a drill bit for vertical adjusting movement with respect thereto, a base structure forming a supporting foot for said frame structure and including gripping means for attaching the base structure to the work surface, a plate member secured to the bottom of said frame structure, said plate member having an elongated opening therein, holding means secured to said gripping means and extending through said elongated opening for adjustably holding said plate member on said gripping means, locking means positioned in said plate member, said locking means comprising a plurality of ball bearings, and actuating means for pressing selected ones of said ball bearings into engagement with said holding means and locking said frame structure and said base structure in a selected position with respect to each other.

3. In an adjustable positioner for a drill mount or the like, a frame structure comprising an upright hollow post having a plate at the base thereof, a base structure including an electromagnet for gripping the work surface, adjustable means for holding said plate on said base structure, said adjustable means comprising a member projecting from said base structure through an opening formed in said plate, a washer adapted to engage said plate, means for retaining said washer on said member, locking means including movable means carried by said plate and means for urging said movable means into engagement with said washer to hold said plate in a selected position on said base structure.

4. In an adjustable positioner for a drill mount or the like, a frame structure comprising an upright hollow post having a plate at the base thereof, a base structure including an electromagnet for gripping the work surface, adjustable means for holding said plate on said base structure, said adjustable means comprising a member projecting from said base structure through an opening formed in said plate, a washer adapted to engage said plate, means for retaining said washer on said member, said plate having a cavity, locking means comprising a plurality of ball bearings positioned in said cavity, and means comprising a member threaded into said plate for urging selected ones of said ball bearings into engagement with said washer to hold said plate in a selected position on said base structure.

5. In a radial positioner for a drill mount or the like, a frame structure comprising an upright post having a base flange, a base structure including gripping means for attaching the base structure to the work surface, a plate interposed between said base flange and said base structure attached to said base flange, a member fixedly attached to said base structure and extending through an elongated opening in said plate, clamping means positioned in a radially extending opening in said plate, said member having means overhanging the inner end of said radially extending opening which is laterally spaced from said elongated opening, said clamping means including ball means which is adapted to be pressed into frictional engagement with said overhanging means, and a rod threaded into said radially extending opening for pressing said ball means into engagement with the underside of said overhanging means whereby said base flange and said base structure are secured together in any one of a plurality of radially and angularly different positions with respect to each other.

6. In a radial positioner for a drill mount or the like, a frame structure comprising an upright post having a base flange, a base structure including gripping means for attaching the base structure to the work surface, a plate interposed between said base flange and said base structure attached to said base flange, a member fixedly attached to said base structure and extending through an

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opening in said plate, clamping means positioned in a radially extending opening in said plate, said member having means overhanging the inner end of said radially extending opening, said radially extending opening being laterally spaced from said elongated opening, said clamping means including means which is adapted to be pressed into frictional engagement with the under side of said overhanging means, said plate having adjustable means for pressing said last mentioned means into engagement with said overhanging means whereby said base flange and said base structure are secured together in any one of a plurality of radially and angularly different positions with respect to each other.

7. In a radial positioner for a drill mount or the like, a frame structure comprising an upright post having a base flange, a base structure including gripping means for attaching the base structure to the work surface, a plate interposed between said base flange and said base

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structure, a clamping structure comprising a vertically extending member connected to said base structure and extending through an opening in said frame structure and also having means overhanging a portion of said frame structure, clamping means positioned in a radially extending opening in one of said structures, said clamping means including ball means which is adapted to be pressed into frictional engagement with said clamping structure, adjustable means in said radially extending opening comprising a rod threaded into said radially extending opening for pressing said ball means into engagement with said clamping structure whereby said base flange and said base structure are secured together in any one of a plurality of positions with respect to each other.

No references cited.

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