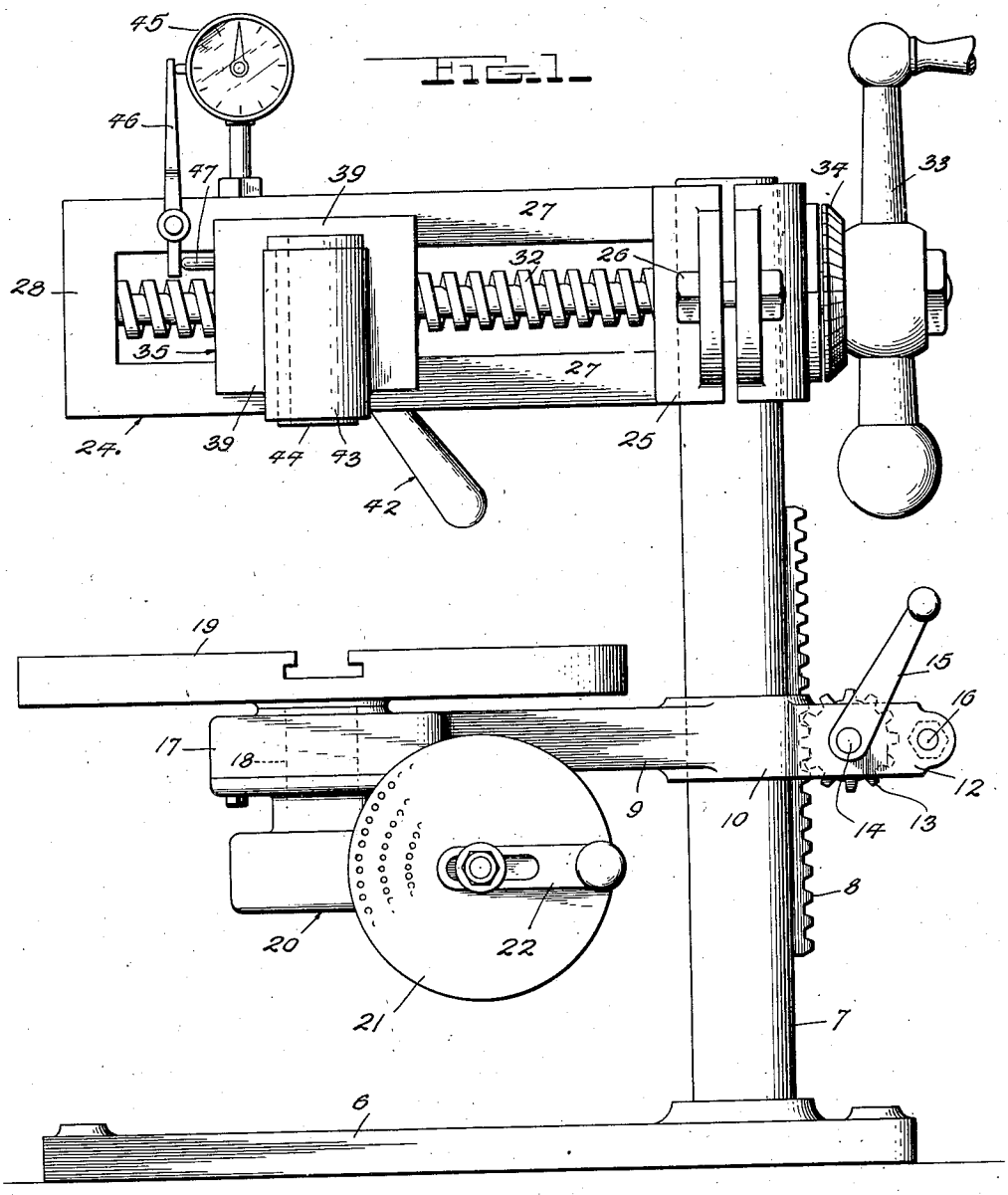
Jan. 7, 1947. W. H. BEITZ 2,413,677

DRILLING JIG

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FIG. 1



Inventor

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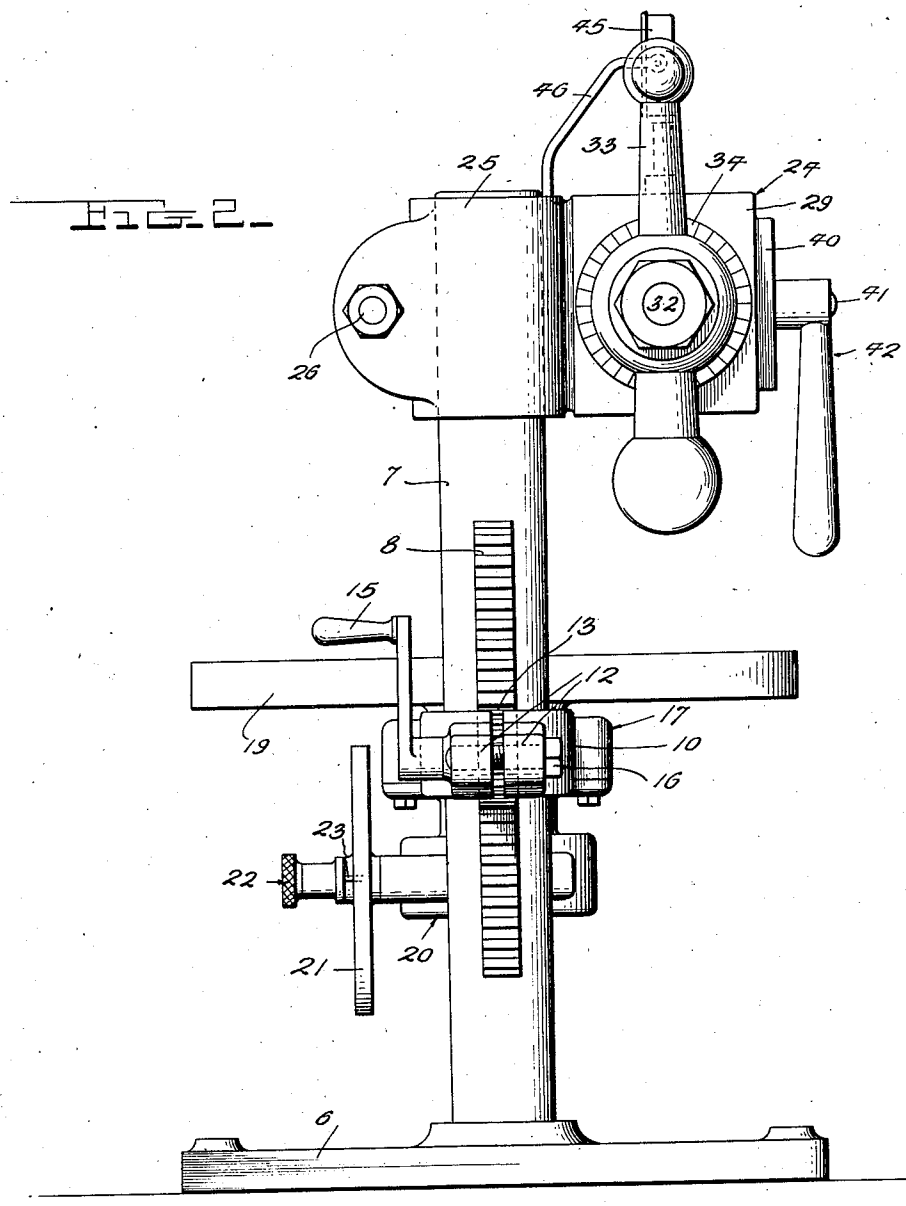
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FIG. 2



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FIG. 3

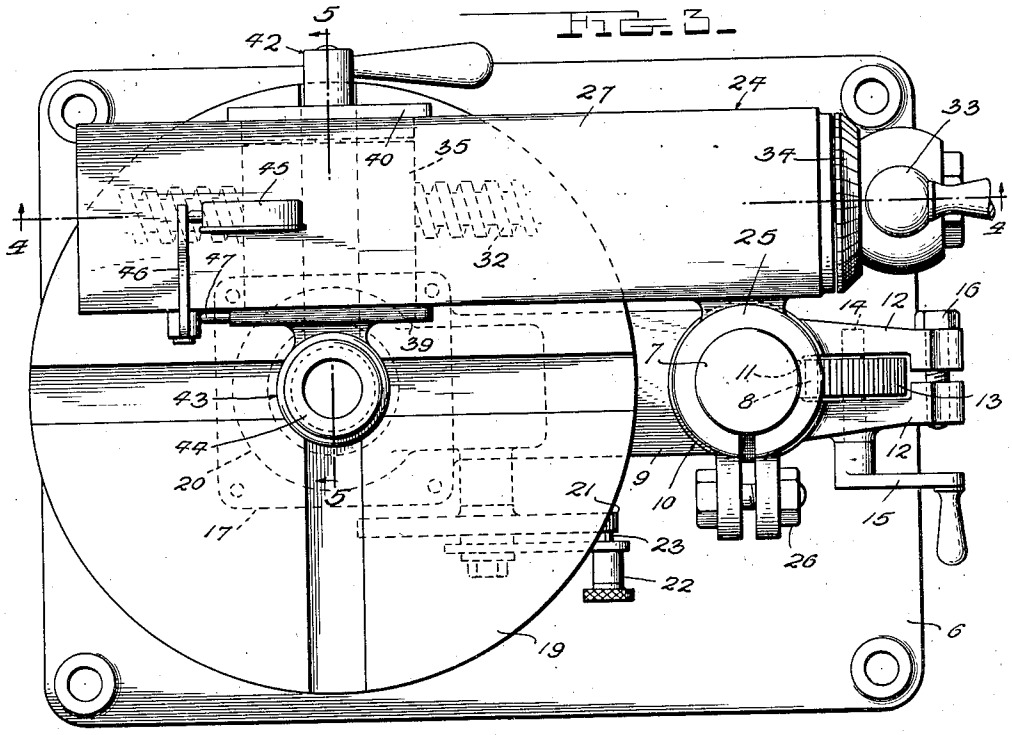


FIG. 4

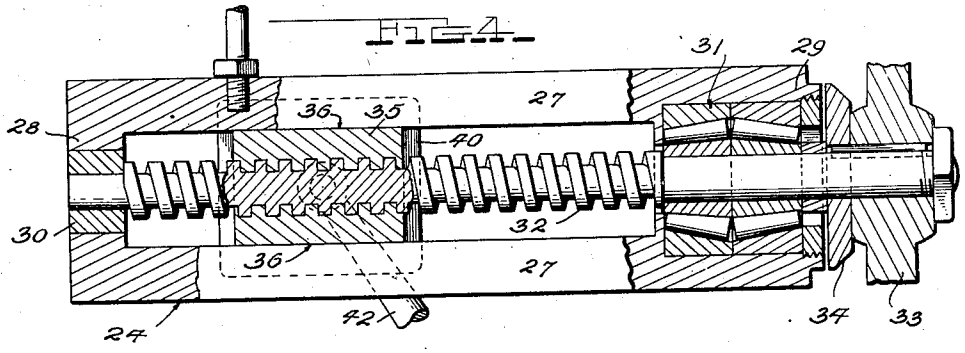
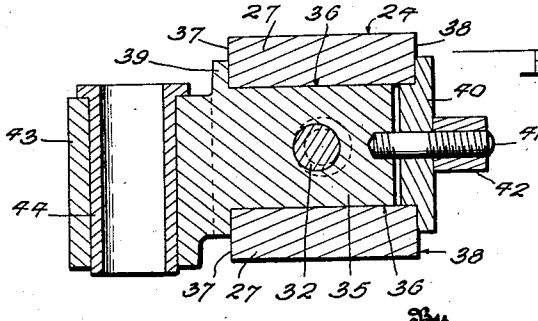


FIG. 5



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UNITED STATES PATENT OFFICE

2,413,677

DRILLING JIG

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Application February 10, 1945, Serial No. 577,266

3 Claims. (Cl. 77—62)

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The invention aims to provide a new and improved jig for use in drilling openings spaced equidistantly from each other around a central point and spaced equally from said point, said jig being readily adjustable according to the spacing which the openings must have with respect to each other and with respect to said central point. Thus, it is not necessary to set up a different jig for each job.

Figure 1 of the accompanying drawings is a side elevation of the jig.

Fig. 2 is a side elevation viewed from the right of Fig. 1.

Fig. 3 is a top plan view.

Figs. 4 and 5 are vertical sectional views as indicated by lines 4—4 and 5—5 of Fig. 3.

A preferred construction has been illustrated and will be rather specifically described, with the understanding, however, that within the scope of the invention as claimed, variations may be made.

A suitable horizontal base 6 is provided to be secured upon the usual work-supporting table of a drillpress after adjustment of the jig. A standard 7 is rigidly secured to and projects upwardly from the base 6, said standard having a longitudinal rack 8. A lower horizontal arm 9 is provided with a hub 10 slidable upon the standard 7, said hub having a split 11 which receives the rack 8. The side walls of this split may well contact with opposite sides of the rack to prevent the hub from turning to any extent upon the standard, or if desired, said hub could be keyed or splined to said standard. The hub 10 has two rigid arms 12 projecting outwardly at opposite sides of the split 11, and between these arms a pinion 13 is mounted, said pinion meshing with the rack 8. Pinion 13 is secured to a shaft 14 mounted in bearing openings of the arms 12, and said shaft has an operating crank or the like 15. The outer extremities of the arms 12 are connected by a clamping screw 16 or other suitable means whereby said arms may be drawn toward each other to tightly contract the hub around the standard 8 after any required vertical adjustment of said hub to elevate or lower the arm 9. The end of this arm remote from the standard 7 is enlarged suitably as indicated at 17 to contain an appropriate bearing for a short vertical shaft 18 upon which an appropriate work-supporting table 19 is secured. Secured to the lower side of the enlargement 17 is a conventional dividing head 20 for turning the table 19 any required extent and then locking it, said dividing head including the usual index disk 21, crank 22, and releasable pin 23 engageable with the well known openings of said index disk.

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An upper arm 24 is provided, said arm having a lateral hub 25 near one end which is secured upon the upper end of the standard 7, said hub 25 being preferably split and provided with a clamping bolt 26 by means of which it may be tightly contracted around said standard. Obviously, if desired, the hub could be keyed to the standard or otherwise positively held against turning thereon.

The arm 24 includes upper and lower longitudinal members 27 disposed horizontally in parallel relation, and end members 28 and 29 rigidly connecting the ends of said longitudinal members 27, said end members and longitudinal members being preferably integral with each other. Appropriate bearing means 30 and 31 are mounted in the end members 28 and 29 respectively, and rotatably support a horizontal screw 32, the bearing 31 being preferably of tapered race, cone and roller construction, in duplicate, and arranged to hold the screw 32 against endwise movement in either direction. On the end of this screw, adjacent the end member 29, an operating handle 33 and an index disk 34 are secured.

A rectangular nut 35 is engaged by the screw 32 and is slidably received between the upper and lower members 27 of the arm 24, said members 27 having flat horizontal inner sides 36 slidably contacting with the upper and lower sides of said nut. The members 27 also have vertical outer sides which are given the reference numbers 37 and 38 in Fig. 5. Flanges 39 on one end of the nut 35 abut the sides 37, and a clamping plate 40 abuts the sides 38. A stud 41 is carried by the nut 35 and extends through the plate 40, the outer end of this stud being provided with a lever nut 42. When this nut is loosened and the screw 32 rotated, obviously the nut 35 will be adjusted longitudinally of the arm 24. Tightening of the nut 42 will then lock nut 35 in the position to which it has been adjusted.

The flanged end of the nut 35 rigidly carries a vertical sleeve 43 in which a bushing 44 is removably held to receive the drill of the drill press while the jig is in operation. Obviously, a number of the bushings 44 will be supplied and a bushing of proper size may be inserted into the sleeve 43 for the particular job to be done.

It is necessary to provide some sort of accurate and readily visible indicating means to show when the center of the bushing 44 is directly alined with the center of the table 19. A dial gauge 45

has been shown for this purpose mounted upon the arm 24 and operable by means of a lever 46 which is fulcrumed to said arm, the nut 35 being provided with an actuating pin 47 to abut and operate said lever 46. As shown in Fig. 1, this lever 46 is fulcrumed at a point to cause its gauge-operating upper end to travel many times the distance which its lower end is moved by the pin 47. Thus, the slightest deviation of the sleeve 43 from axial alinement with the table 19 when adjusting to attain such alinement, will be greatly multiplied by the dial gauge 45 and may be easily seen and corrected.

Assuming that a plurality of openings are to be drilled in the work two inches from a common center, the work is secured upon the table 19 with said center directly in line with the center of said table, and the screw-operating crank 33 is then turned until the dial gauge 45 shows that the bushing 44 is directly alined with the aforesaid centers of the work and table. By now turning the crank 33 to the proper extent, it will be seen that the axis of the bushing 44 may be offset exactly to the required two inches from the center of the work, the index plate 34 being of course instrumental in making this adjustment. The bushing having been set, the nut 35 is locked by tightening the lever nut 42. Now, when the drill of the drill press is lowered through the bushing 44 and the base 6 is clamped to the work support of said drill press, the jig is in readiness for drilling of the holes. After the first hole is drilled and the drill withdrawn from the work, the crank 22 of the dividing head 20 is operated to turn the work the amount which the various openings are to be spaced from each other, and said crank 22 is then locked by re-engaging the pin 23 with the index plate 21. The second hole is now drilled and the operatitons described are repeated for the others.

From the foregoing taken in connection with the accompanying drawings, it will be seen that novel and advantageous provision has been made for carrying out the object of the invention, and while preferences have been disclosed, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. A drilling jig comprising a base for anchorage upon a drill press table or the like, a single vertical standard secured at its lower end to said base near one edge thereof, an upper arm and a lower arm secured to said standard and projecting horizontally in the same direction over said base, the outer ends of both of said arms being free, a work-supporting table mounted on a vertical axis on said lower arm for rotative adjustment, a slide mounted on said upper arm for adjustment longitudinally thereof, said slide having a drill-receiving sleeve, means for adjusting said slide longitudinally of said upper arm to offset the axis of said sleeve any required distance from the axis of said table, means for locking said slide after adjustment, and means whereby said table may be locked after rotative adjustments.

2. A drilling jig comprising a horizontal base for anchorage upon a drill press table or the like, a single vertical standard secured at its lower end to said base near one edge thereof, a lower arm mounted on said standard for vertical adjustment and having a free outer end, a work-supporting table rotatably mounted on said free outer end of said lower arm, a dividing head mounted on said lower arm and connected with said table for turning the latter and locking it, an upper arm secured to said standard and having a free end overlying said table, a slide mounted on said upper arm for adjustment longitudinally thereof, said slide having a drill-receiving sleeve, a screw mounted on said upper arm and engaged with said slide for adjusting the latter longitudinally of said upper arm, said screw having an index disk for indicating required rotation of said screw to move said slide for offsetting the axis of said sleeve any required distance from the axis of said table, and a dial gauge actuated by said slide for conspicuously showing when said slide occupies the required position to axially aline said sleeve with said table.

3. In a drilling jig, a base, a standard secured to and projecting upwardly from said base, a horizontal arm secured to said standard, said arm comprising upper and lower parallel longitudinal members and end members connecting the ends of said longitudinal members, said longitudinal members each having a flat horizontal inner side and two vertical outer sides, alined bearings mounted in said end members, a hand-operated screw mounted in said bearings and extending longitudinally between said longitudinal members, a rectangular block through which said screw is threaded, said block having flat upper and lower sides slidably contacting with said flat horizontal inner sides of said longitudinal members to guide said block, said block having integral vertical flanges on one end abutting one of said vertical sides of said longitudinal members, said flanges extending vertically no further than the upper and lower sides of the aforesaid arm, a clamping plate abutting the other of said vertical sides of said longitudinal members, and a threaded fastener horizontally connecting said clamping plate with the end of said block remote from its flanged end for drawing them toward each other to lock said block after adjustment by said screw, said block having an integral drill-receiving sleeve on said flanged end and spaced outwardly from said one of said vertical sides of said longitudinal members.

WILLIAM H. BEITZ.