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DRILL JIG.

APPLICATION FILED NOV. 8, 1907.

907,735. Patented Dec. 29, 1908.

Fig. 1.

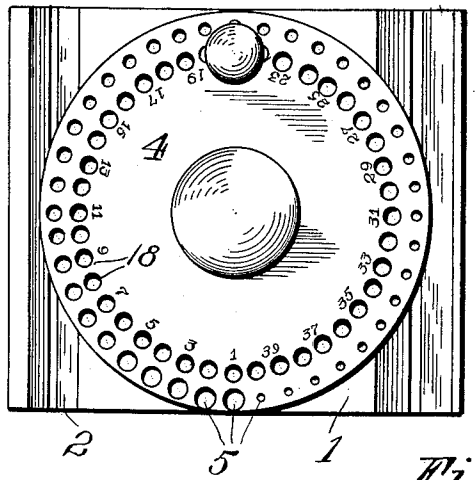


Fig. 2.

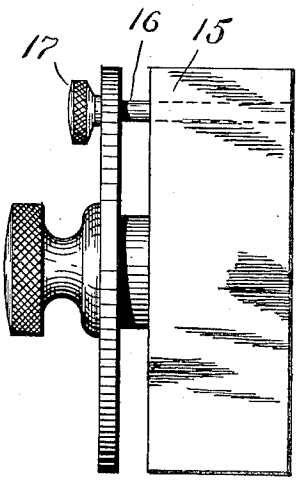


Fig. 3.

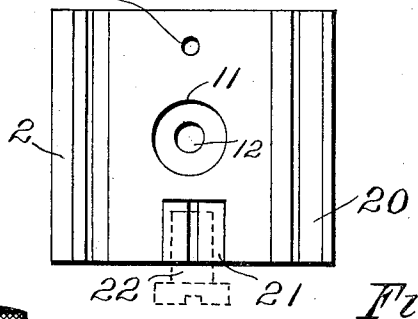


Fig. 4.

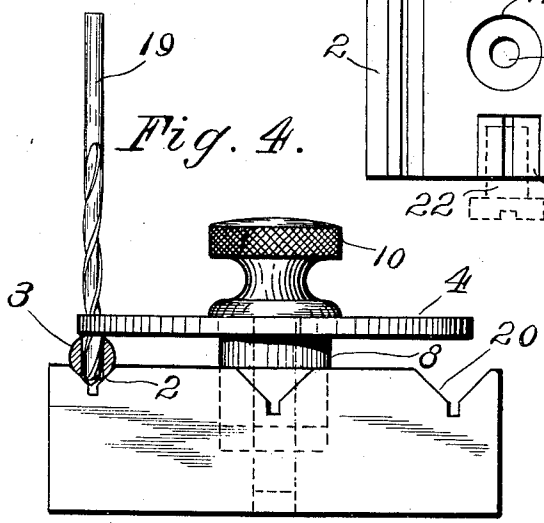
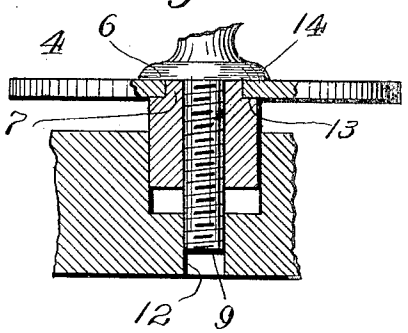


Fig. 5.



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DRILL-JIG.

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To all whom it may concern:

Be it known that I, CHARLES C. CAIN, Jr., a citizen of the United States, residing in borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Drill-Jigs, of which the following is a specification.

This invention relates to a jig or appliance for facilitating the operation of drilling shafts, studs and analogous articles.

The object of the invention is to provide simple and inexpensive means for enabling a hole of any desired size to be drilled transversely in a shaft, stud or like article.

In carrying out my invention, I form a V-groove in a block to receive the shaft to be drilled, and I mount upon said block a disk having around its border a succession of drill guiding holes of graduated diameters, any one of which may be brought into line with the center of the shaft to be drilled, the disk being revolubly mounted for this purpose. I provide means for indexing the disk, to insure accuracy in positioning the drill guiding hole centrally of the shaft or of the V-groove which holds the shaft, and I also provide means for clamping the disk down upon the shaft or work.

In the preferred manner of practicing the invention, grooves are formed upon opposite sides of the block, and the disk overhangs both grooves, so that it may be used in connection with either of them. These grooves are of different capacities, to suit either small work or large work. A third groove, which is distinguished from the others in being radial instead of tangential, may be formed half way between the other grooves to extend from the edge of the block towards the axis about which the disk revolves. This third groove accommodates the shanks of screws or other headed articles. A single indexing device positions the disk to coöperate with all three grooves. The indexing device preferably comprises a circular series of evenly spaced holes formed in the disk within the circle of drill guiding holes, and a single vertical pin which may be passed down through any of the index holes into a deep hole or seat in the block. The index pin is of sufficient length to accommodate the vertical adjustments of the disk.

In the accompanying drawings, Figure 1 is a plan of a drill-jig embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a plan of the block. Fig. 4 is an end elevation of the jig, showing a drill guide in the disk and penetrating the work. Fig. 5 is a sectional elevation illustrating the manner of mounting the disk.

In a block 1 of metal is cut a V-groove 2 to receive the shaft or other work 3 which is to be drilled. Any other form of work holder or support may be used in place of the V-groove, within the scope of the invention. A horizontal disk 4, having around its edge or border a circular series 5 of drill holes of graduated sizes, is pivotally mounted upon the block, the disk having a central aperture or pivot-hole 6 to fit upon a cylindrical neck 7 of a collar 8, which is threaded or otherwise secured upon a shank 9 of a screw, the latter having a finger-piece or head 10. The collar 8 fits snugly in a vertical pivot hole 11 formed in the center of the block, and the projecting threaded lower end of the screw 9 is threaded into a central hole 12 extending through the block below the depression 11. The disk 4 is loosely confined between a shoulder 13 formed upon the upper end of the collar, and a flange 14 formed on the screw.

In the block is formed, at a point remote from the groove 2, a deep vertical hole or seat 15 to receive a positioning or index pin 16, passing down through the disk and having a head 17 above the same. Said pin 16 may pass through any of a circular series of holes 18 formed at equal angular intervals in the disk within the circular series of drill guiding holes 5. It will be understood that when the pin 16 registers one of the holes 18 with the hole 15, the corresponding drill guiding hole 5 occupies the proper position for guiding a drill to the center of a cylindrical shaft 3 placed in the work holder 2.

In operation the thumb piece 10 may be turned to unscrew and screw 9 and raise the disk 4, the latter being moved by the shoulder 13, which raises with its screw. Then the cylindrical shaft or other work 3 is placed in the groove 2, and the disk 4 is ro

tated until the selected drill guiding hole 5 registers with the axis of the shaft 3 or with the center of the V-groove 2. The pin 16 aids in securing and serves to maintain this register. Then the thumb piece 10 is turned to screw down the screw 9 and the flange 14 clamps the disk 4 down upon the work 3. Then the drill 19 is employed to drill a hole in the work 3. Preferably upon the opposite edge of the block 2 is formed a second V-groove 20 parallel with the groove 2, but of much greater width or much larger capacity, to accommodate larger shafts. It will be seen that any of the drill guiding holes 5 may be brought to the central line of the groove 20, and that the operation is similar to that already described with reference to the groove 2.

In one end of the block may be formed a short groove 21, this groove being radial or extending from the edge of the block to the axis about which the disk 4 revolves; the grooves 2 and 20 being tangential to the circular series of drill holes 5. This short groove 21 will accommodate the shank 22 of a headed screw or other headed device, and any of the drill guiding holes 5 may be brought into register with the central line of the groove 21.

The single index pin 16 serves to position the disk for drilling work placed in any one of the three grooves. Preferably the index holes 18 are placed at intervals of about nine degrees, and are forty in number; the drill guiding holes 5 being placed in the same manner. The pivot of the arbor 4 being half way between the centers of the grooves 2 and 20, and the central line of the parallel groove 21 passing through the center of said pivot, it follows that when any drill guiding hole is in register with either of the three grooves, two other drill guiding holes are in register with the other two grooves; the central lines of the outer grooves touching the circular drill guiding holes at opposite points, each of which is separated by ninety degrees from the center line of the groove 21. If desired, the indexing holes may be numbered, as illustrated at Fig. 1, for convenience in adjusting the disk.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. The combination with a block provided with a V-groove to position the work, of a drill guide in the form of a disk revolubly mounted upon said block with its edge portion overhanging said groove, and having in said edge portion a circular series of holes to guide the drills to the work, and means mounted at the center of the disk for clamping said disk down upon the work.

2. The combination with a block provided with a V-groove to position the work, of a drill guide in the form of a disk whose edge overhangs said groove and contains a series of drill guiding holes, and a threaded arbor mounted on the block and having means whereby it may be rotated, and provided with means to clamp the disk down upon the work.

3. The combination with a block provided with a V-groove to position the work, of a drill guide in the form of a disk whose edge overhangs said groove and contains a series of drill guiding holes, and an arbor having means whereby it may be rotated; said arbor comprising a stem portion threaded at its lower end into the block; and also having a head to clamp the disk down, and a collar below said disk connected to said shank to lift the disk.

4. The combination with a block provided with a V-groove to position the work, of a drill guide in the form of a disk whose edge overhangs said groove and contains a series of drill guiding holes, and an arbor having means whereby it may be rotated and also having a head to clamp the disk down, and having a collar below said disk to lift the disk, said collar fitting in a cylindrical hole or depression in the block, and said arbor having a threaded end projecting down from said collar and threaded into said block below said depression.

5. The combination with a block, of a drill guide in the form of a disk revolubly mounted upon said block and provided with a series of drill guiding holes, a V-groove to position the work being provided in said block and extending tangentially of said circular series, a second V-groove being also provided in said block and extending from the edge thereof towards the axis of said disk, and a single indexing means for positioning said disk relatively to both of said grooves.

6. The combination with a block provided with a plurality of V-grooves of different capacities to position the work, of a drill guide in the form of a disk revolubly mounted upon said block with its edge portion overhanging said grooves and having drill guiding holes in said edge portion, and a single indexing means for positioning the disk relatively to all of said grooves.

7. The combination with a block provided with a plurality of V-grooves of different capacities to position the work, of a drill guide in the form of a disk revolubly mounted upon said block with its edge portion overhanging said grooves and having drill

guiding holes in said edge portion; said grooves being located at opposite sides of the block and said disk being mounted between said grooves, index holes being formed at uniform intervals around the disk to correspond to the drill guiding holes, and a single index pin to fit said index holes and having a seat in the block; the holes and the seat being positioned to enable the index pin to position the disk for coöperation with all of said grooves.

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