

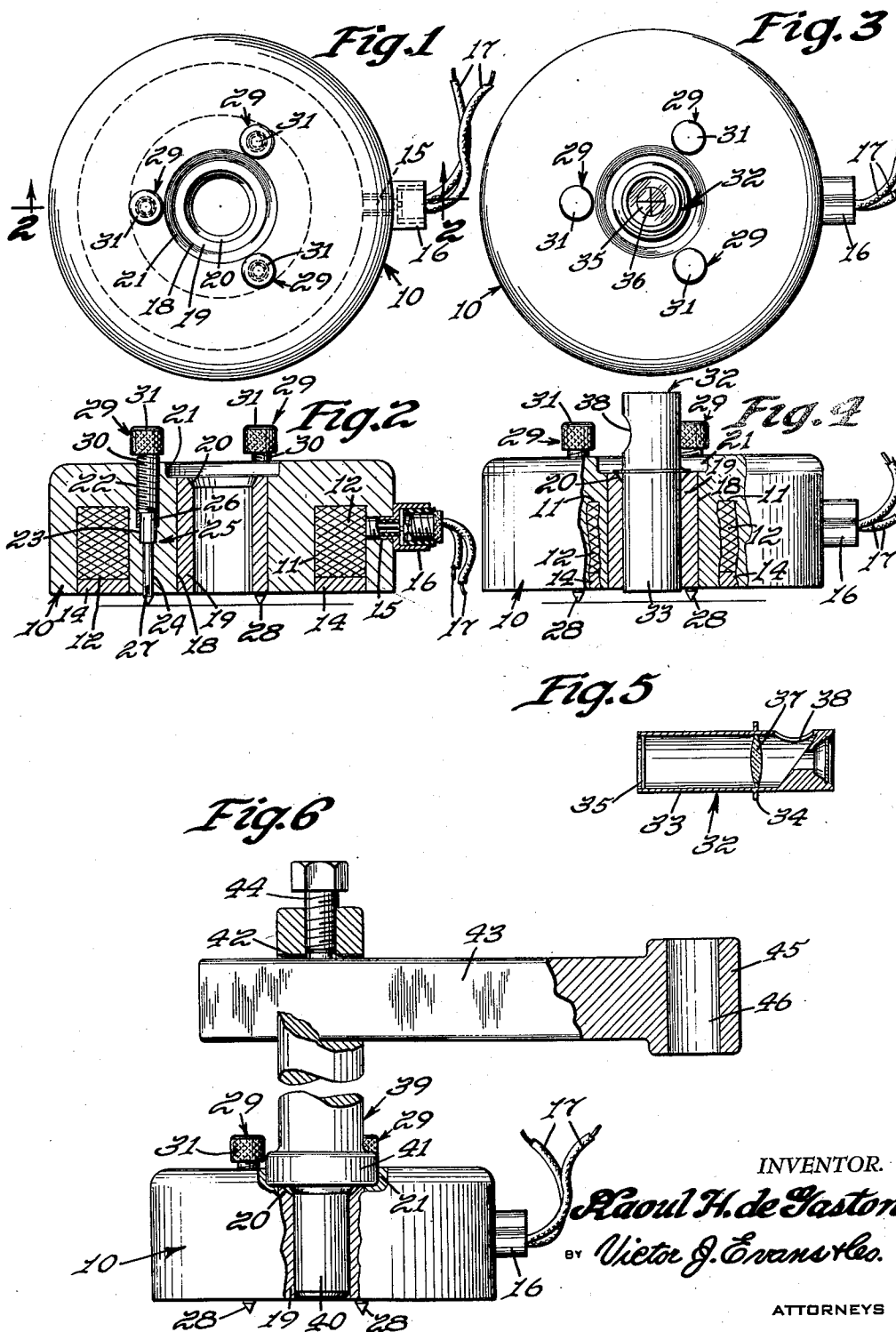
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MAGNETIC TOOL GUIDE

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## MAGNETIC TOOL GUIDE

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4 Claims. (Cl. 33—189)

This invention relates to a tool support or guide, and more particularly to a magnetic tool guide.

The object of the invention is to provide a magnetic tool holder which permits a tool guide to be readily set in its proper position without the use of clamps or the like.

Another object of the invention is to provide a magnetic tool guide or holder which includes a magnetized base that has pins projecting therefrom, the pins adapted to engage a suitable work surface so as to help prevent accidental movement of the base and wherein a viewing glass can be used to properly locate the device.

A further object of the invention is to provide a magnetic tool guide which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a top plan view of the tool guide.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a top plan view similar to Figure 1 but showing the viewing glass positioned in the device for properly locating or positioning the base.

Figure 4 is a view corresponding to Figure 3, but taken in side elevation, and with parts broken away and in section.

Figure 5 is a longitudinal sectional view taken through the viewing glass.

Figure 6 is a side elevational view, with parts broken away and in section, illustrating the tool support mounted in the base.

Referring in detail to the drawings, the numeral 10 designates a base which is adapted to be made of any suitable material such as a material having a high magnetic permeability. The base 10 is provided with a circular recess 11 which extends upwardly from the lower end thereof, and coil windings 12 are positioned in the recess 11. A ring 14 is positioned in the bottom of the recess 11 for maintaining the coil windings 12 in their proper position in the recess 11. The bottom of ring 14 is flush with the bottom of the base. A means is provided for connecting the coil windings 12 to a suitable source of electrical energy, and this means comprises a collar 15 which has terminals 16 arranged in engagement therewith, Figure 2, and wires 17 extend outwardly therefrom, and the wires 17 are adapted to be connected to a suitable source of electrical energy.

The base 10 is further provided with a central circular opening 18 which snugly receives therein a cylindrical bushing 19. The bushing 19 has its lower end lying in the same plane as the bottom of the base. The upper inner surface of the bushing 19 may be beveled or countersunk as at 20. The upper surface of the base 10 is provided with an aperture 21 which communicates with

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the opening 18, and the aperture 21 is of greater diameter than the opening 18.

The base 10 is further provided with a plurality of spaced parallel bores which each include an upper threaded portion 22, an intermediate smooth portion 23, and a lower smooth portion 24, Figure 2. The portion 24 is of less diameter than the portion 23, and the portion 23 is of less diameter than the portion 22. Seated in each of the bores is a pin which is indicated generally by the numeral 25. Each of the pins has the same construction and each includes an enlarged shoulder 26 which projects into the intermediate portion 23, and the lower end of each pin 25 includes a cylindrical shank 27 which extends through the bottom portion 24. Each of the shanks 27 has its lower end terminating in a pointed tip 28 for engagement with a work surface.

Arranged in the upper end of each of the bores is a thumb screw which is indicated generally by the numeral 29, and each thumb screw 29 includes a threaded stem 30 which threadedly engages the upper portion 22 of the bore. A knurled knob 31 is on the upper end of each thumb screw so that the thumb screws can be readily removed or replaced.

A viewing glass 32 is adapted to be used in order to properly position the base 10, and the viewing glass is shown in detail in Figure 5 and includes a cylindrical sleeve 32 which is adapted to project through the hollow bushing 19. An annular flange 34 on the sleeve 33 is adapted to abut the upper end of the bushing 19, and a plate 35 in the bottom of the sleeve has cross hairs 36 thereon, Figure 3. A lens 37 is positioned within the sleeve, and a cutout 38 permits sufficient light to enter the sleeve so that the device can be readily observed.

Referring to Figure 6 of the drawings there is shown a tool support mounted in the base 10, wherein the numeral 39 designates a vertically disposed post which includes a lower cylindrical section 40 which is snugly seated in the bushing 19. An annular flange 41 on the post 39 is adapted to be seated in the aperture 21, and the upper portion of the post 39 is provided with a cutout 42 through which extends a bar 43. A set screw 44 extends through the post 39 and into engagement with the bar 43, and the outer end of the bar 43 is provided with an enlargement 45 which has an opening 46 extending therethrough for receiving any suitable tool.

From the foregoing it is apparent that there has been provided a magnetic tool guide and in use the coil 12 can be energized by means of the wires 17, which can lead to a suitable source of electrical energy. The body 10 will thus become magnetized so that it will remain immobile on the work or supporting structure. Before the base 10 is finally positioned, the viewing glass 32 can be inserted into the bushing 19 as shown in Figures 3 and 4. Then, by looking through the top of the viewing glass, the cross hairs 36 can be made to coincide with a suitable indicia or point on the work so as to properly align the base 10. After the base has been properly aligned the viewing glass 32 can be removed and then a device such as the post 39 can be inserted in the bushing 19. Thus, the bar 43 can be used for supporting a tap, reamer or any other tool. The pointed end 28 of the pins 25 help maintain the base 10 in its proper adjusted position.

The body or base 10 is preferably made of a high magnetic permeability alloy which is manufactured with great accuracy and concentricity with respect to the center hole and the outside diameter. The bushing 19 may be made of hardened steel and may be of a size to receive standard drill bushings, fixtures and the like. The eye piece 32 can be inserted into the bushing 19 to facilitate locating the device with respect to scribed lines and the like. The pins 25 prevent sliding motion during usage and the coil

12 supplies the magnetomotive force. The ring 14 seals the unit and retains the windings 12 in place and the contact 16 provides a means for affixing the necessary electrical connections. The magnet is very strong and can be used in guiding drills, and taps and reamers in a machine shop.

Thus, the present invention utilizes a magnet as a means for quickly locating and setting or fixing a tool guide such as a drill bushing, tap or the like at a position without the use of clamps or the like since the magnet is sufficiently strong to insure that once it is located, a person such as a mechanic can drill work with a high degree of accuracy. While an electric magnet is illustrated, it is to be understood that the present invention is not to be confined to such use since magnets of the permanent type may be used. The size of the base 10 can be varied as desired, and the hole or opening 18 is of such a size as to receive standard drill bushings or such fixtures as desired. As an illustration of a use thereof, a pivoting arm can be set in position for the purpose of using the firm base for scribing circles. Or, by having a sliding guide attached to the pivoting position in the center of the magnet, an extended bushing for tapping or reaming can be used with an assurance of squareness in relation to the work to thereby save the operator from the necessity of moving the work to a tapping machine. Thus, the present invention will permit a drill bushing to be fixed at an exact position on the work and the bushing will act as a guide for accurately prelocating the work and substantially holding it in position while the actual work is being performed. The magnet can be used for accurate locating and guiding of tools and the positioning pins 25 help hold the device in place and also in the event that any slippage occurs, they will make marks on the supporting device to thereby indicate that movement has occurred.

Since the bushing 19 is made with great precision with respect to the outer surface of the body, depth-mikes, gauge blocks and the like can be aligned. The eye piece combined with the magnetic tool guide permits rapid sinking of holes or locating in general. It is intended that this tool be applied directly to the work to be done.

#### I claim:

1. In a magnetic tool guide, a base of high magnetic permeability, said base being provided with a circular recess extending upwardly from its lower surface, a coil positioned in said recess and adapted to be connected to a source of electrical energy, a ring arranged in the lower portion of said recess and the bottom of said ring being flush with the bottom of said base, there being a central opening in said base, a cylindrical bushing snugly seated in said opening and having its lower end lying in the same plane as the bottom of said base, the upper inner surface of said bushing being countersunk, there being a counterbored aperture in the upper end of said base of greater diameter than said opening and communicating with said opening, said base being provided with a plurality of spaced parallel bores, each of said bores including an upper threaded portion, an intermediate smooth portion of less diameter than said upper portion, and a lower smooth portion of less diameter than said intermediate portion, pins each including a cy-

lindrical shank extending through the lower portion of the bore and having their lower ends pointed for engagement with a work surface, an enlarged shoulder on the upper end of each of said pins seated in said intermediate portion, and a thumb screw having a threaded stem engaging the upper portion of each bore, and a knurled knob on the upper end of each thumb screw.

2. The structure as defined in claim 1, and further including a vertically disposed post extending upwardly from said base.

3. In a magnetic tool guide, a base of high magnetic permeability, said base being provided with a circular recess extending upwardly from its lower surface, a coil positioned in said recess and adapted to be connected to a source of electrical energy, a ring arranged in the lower portion of said recess and the bottom of said ring being flush with the bottom of said base, there being a central opening in said base, a cylindrical bushing snugly seated in said opening and having its lower end lying in the same plane as the bottom of said base, the upper inner surface of said bushing being countersunk, there being a counterbored aperture in the upper end of said base of greater diameter than said opening and communicating with said opening, said base being provided with a plurality of spaced parallel bores, each of said bores including an upper threaded portion, an intermediate smooth portion of less diameter than said upper portion, and a lower smooth portion of less diameter than said intermediate portion, pins each including a cylindrical shank extending through the lower portion of the bore and having their lower ends pointed for engagement with a work surface, an enlarged shoulder on the upper end of each of said pins seated in said intermediate portion, and a thumb screw having a threaded stem engaging the upper portion of each bore, and a knurled knob on the upper end of each thumb screw, a vertically disposed post having a lower cylindrical section snugly seated in said bushing, an annular shoulder on said post seated in said aperture, there being a cutout in the upper portion of said post, a bar extending through said cutout, a set screw extending through said post and engaging said bar, there being an opening in the outer end of said bar.

4. The structure as defined in claim 1, and further including a viewing glass snugly seated in said bushing.

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