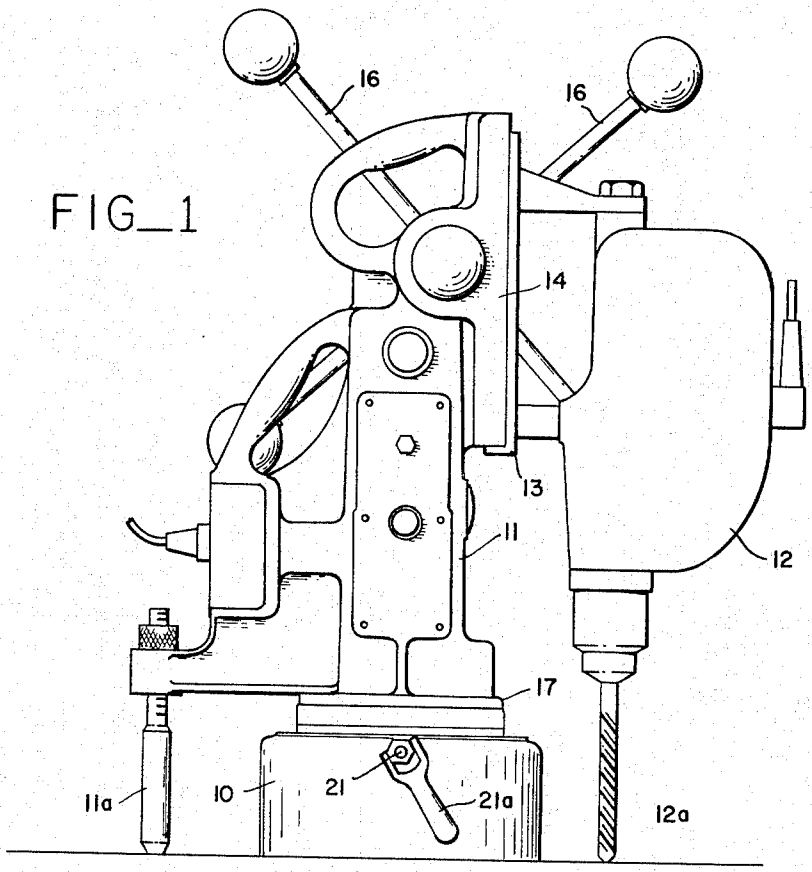
Sept. 19, 1967 B. A. PALM 3,342,089

MAGNETIC DRILL MOUNT WITH BASE MAGNET HAVING ENLARGED OUTER POLE AREAS

Filed Aug. 31, 1965 2 Sheets-Sheet 1

FIG_1



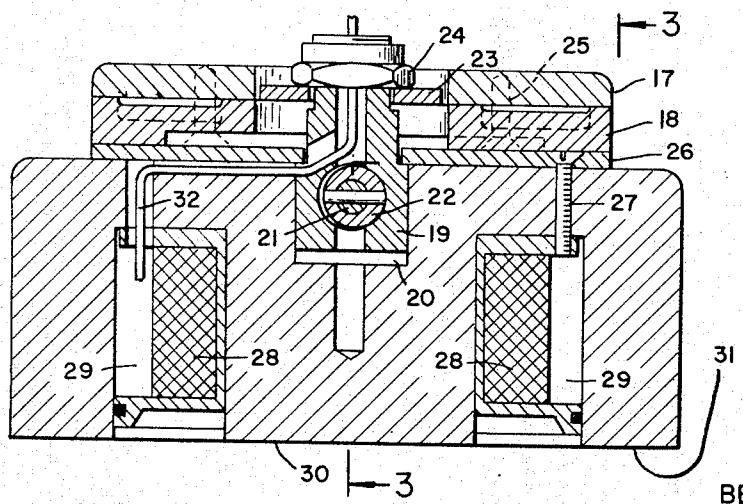


FIG_2

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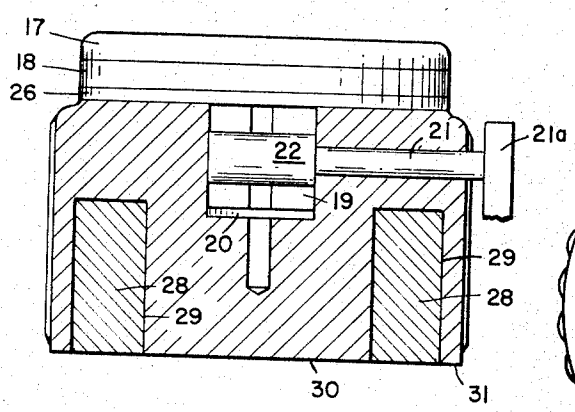

FIG_3

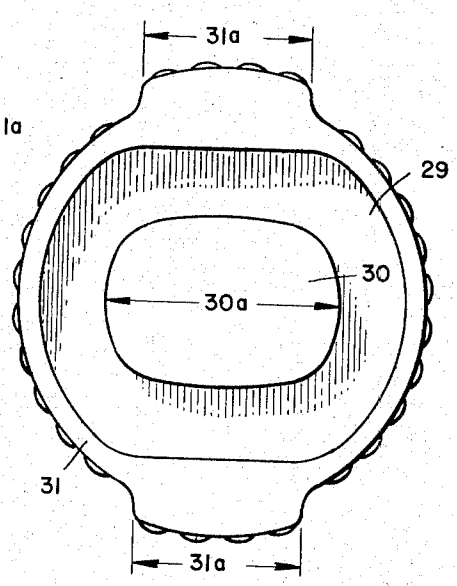

FIG_4

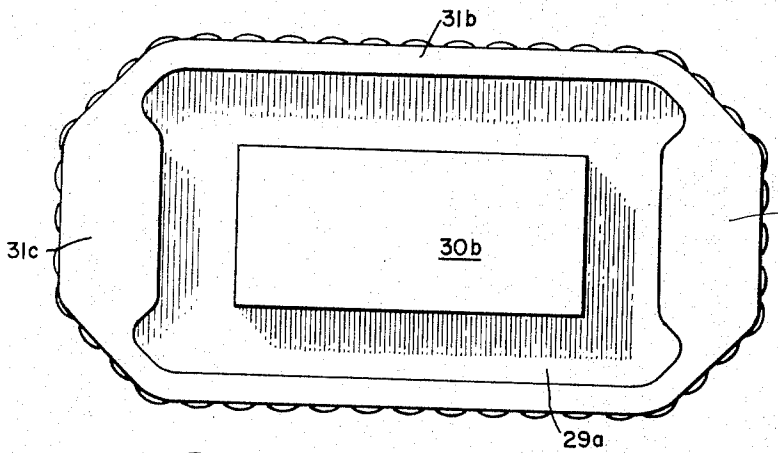

FIG_5

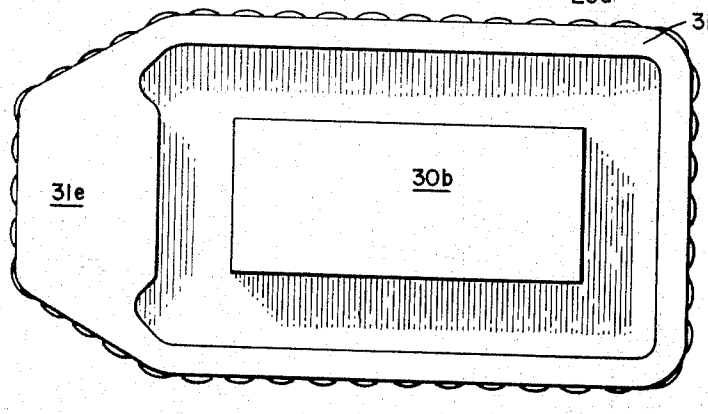

FIG_6

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3,342,089

MAGNETIC DRILL MOUNT WITH BASE MAGNET HAVING ENLARGED OUTER POLE AREAS

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5 Claims. (Cl. 77—59)

This invention relates to magnetic drill mounts in general. More particularly this invention relates to a base magnet for magnetic drill mounts constructed to improve the holding power thereof on curved or narrow work surfaces.

An object of this invention is to provide an improved base magnet for magnetic drill mounts, said magnet being constructed to improve the holding power thereof particularly when the contact area thereof with the gripping surface is reduced.

Another object of this invention is to provide an improved base magnet for magnetic drill mounts, said base magnet being constructed such that a certain area or areas of the outer pole face thereof are enlarged so that efficient gripping power is obtained even in instances where the entire area of the base magnet does not extend over the gripping surface as long as the enlarged pole face extends substantially over such narrow gripping surface.

Another object of this invention is to provide an improved base magnet for magnetic drill mounts, said base magnet having the outer pole face thereof shaped so that the base magnet will grip surfaces that are substantially narrower than the base magnet and support the drill mount thereon.

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 drawing.

Heretofore the base magnets of magnetic drill mounts have been constructed so that the radial width of the outer pole face of the base magnet was substantially uniform throughout the circumference thereof. This construction of the outer pole face required that the base magnet be used on work providing a magnetic gripping surface which was substantially coextensive with the base magnet. In practice, it has been found that it is sometimes desirable to use the magnetic drill mount on work where such a coextensive magnetic gripping surface is not available but rather, work having magnetic gripping surfaces with a width approximately 40% of the width of the base magnet are available. It has been found that by increasing the area of certain sections of the outer pole face and decreasing the areas of other sections thereof provided an outer pole face configuration which enabled the base magnet to be used on work with magnetic gripping surfaces having width substantially less than the width of the base magnet for supporting the magnetic drill mount.

Details of construction of the base magnet provided for this purpose will be set forth in the following specification, claims and drawing in which, briefly:

FIG. 1 is a view in side elevation of a magnetic drill mount employing this improved base magnet;

FIG. 2 is a sectional view taken through the base magnet shown in FIG. 1;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a bottom view of the base magnet shown in FIGS. 1, 2 and 3;

FIG. 5 is a bottom view of a substantially rectangular base magnet; and

FIG. 6 is a bottom view of a modified form of rectangular base magnet.

Referring to the drawing in detail, there is shown in FIG. 1 a magnetic drill mount including an electromagnetic base or base structure **10** forming a part of a frame structure including an upright housing or post **11** on which a portable electric drill **12** is mounted in a conventional manner on a slide **13** carried in suitable guides **14**. The slide **13** is adjustable vertically with the portable electric drill **12** thereon by means of the operating handles **16** in a conventional manner, for example, as disclosed in Buck Patent No. 3,044,321 issued July 17, 1962.

The base **17** of the post **11** may be attached to the base magnet **10** in various ways, such as shown in Walker et al. Patent No. 3,159,061 issued Dec. 1, 1964, Buck Patent No. 3,044,324 issued July 17, 1962, Buck Patent No. 3,044,321 issued July 17, 1962, or Herfurth Patent No. 2,938,411 issued May 31, 1960, all of which show magnetic drill mounts in which the post is adjustable with respect to the base magnet. Thus, the mounting means shown in FIGS. 2 and 3 is shown only by way of example.

In this mounting means there is provided a plate **18** which is attached to the base flange **17** of the post by the screws or bolts **25** which are threaded into the base flange. The base magnet is provided with a cavity **20** in which the enlarged head of the clamping bolt **19** is positioned. A rod **21** extends into a hole in the base magnet **10** and this rod is provided with an eccentric **22** which is attached thereto and which is positioned in a bore extending through the head of the clamping bolt **19**. The outer end of the rod **21** is provided with a handle **21***a* so that the rod may be rotated and the eccentric **22** turned in the bore in the head of clamping member **19**, whereby the nut **24** provided to the upper part of this clamping bolt is caused to bear on the upper side of the clamping washer **23** so that this washer is clamped against the upper surface of the plate **18**. Thus, the bottom surface of plate **18** is clamped against the upper surface of plate **26** which is attached to the top of a magnet base **10** by suitable screws **27**. The plate **26** engages a suitable shoulder positioned on the clamping bolt **19** above the head thereof and retains the head of this member in the hole **20** of the base magnet.

The electromagnetic base **10** is provided with a magnetizing coil or winding **28** that is positioned in the cavity **29** thereof. The winding **28** is positioned around the inner or central pole **30** of the base magnet and suitable insulated electrical conductors **32** passing through passages in the base magnet and clamping bolt **19** supply current to the winding **28** for the energization thereof and for magnetizing the base magnetic structure. The circumferential wall structure of the base **10** functions as the outer pole of the electromagnet which has a pole face **31** that is adapted to engage the work surface.

The central pole face **30** and the outer pole face **31** of the electromagnetic base **10**, shown in FIG. 1, are shaped as shown in the bottom view of FIG. 4. From this figure it will be noted that the parts **31***a* of the outer pole face **31** which are substantially diametrically opposite each other, are made approximately three times as wide as the narrower parts of the outer pole face **31**. Thus, in the radial direction, the widths of the parts **31***a* greatly exceed the radial width of the other parts of the outer pole face **31**. The circumferential widths of the parts **31***a* are made slightly less in each case than the greatest width **30***a* of the substantially oval shaped central pole face **30**.

Thus, with the electromagnetic base **10** constructed as shown in FIG. 4, the magnetic drill mount may be supported on a work surface that is approximately 40 percent

of the width of the base **10** when the electromagnetic base is aligned on the work surface so that both of the enlarged areas **31***a* of the outer pole **31** are aligned with such work surface. In such case the narrow portions of the outer pole face **31** are free of the work surface while the stabilizing leg **11***a* of the drill mount is in engagement with the work surface, as is also the drill bit **21***a* of the electric drill.

The electromagnetic base **10** of this drill mount may be made of substantially rectangular shape, as shown in FIGS. 5 and 6, instead of the more or less circular shape shown in FIG. 4, if desired. In this case, the winding is positioned in the substantially rectangular cavity **29***a* around the central core member **30***b* and the diametrically opposed parts **31***c* of the outer pole face **31***b* are made of larger cross section. The areas of the enlarged parts **31***c* of the outer pole face is somewhat less than the area of the central pole face **30***b*. In this case the stabilizing leg **11***a* and the drill bit **12***a* are also aligned with the long axis of the electromagnetic base when the base is positioned on a narrow work surface. Where desired, one of the areas **31***a* of the outer pole **31***d* may be enlarged, as shown in FIG. 6, and the other end area of the outer pole face may be made the same narrow width as the remaining lengths thereof. The same modification may be made in the substantially circular electromagnetic base shown in FIG. 4, and this base structure may be provided with only one enlarged area in the outer pole face. In such case, it is desirable to make the enlarged area substantially larger than the corresponding enlarged area of one end of the outer pole face shown in FIGS. 4 and 5. In such cases, when the drill mount is in use, both the central pole and the enlarged portion of the outer pole are positioned squarely on the work surface as previously described. It is also apparent that while this magnetic drill structure is described as being efficient for use on narrow work surfaces, it is not confined to use with such surfaces but may, of course, be used on wide flat work surfaces where the work surface extends over the entire magnetic base bottom.

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

What I claim is:

1. In a magnetic drill mount which may be used on magnetic work surfaces that are curved or not as wide as the base of the drill mount, the combination comprising a post for supporting an electric drill, a base magnet comprising a core of magnetic material and a winding, means connecting said winding to a source of current supply for energizing said winding and magnetizing said core, said core having an inner pole face and an outer pole face surrounding said inner pole face, said pole faces being adapted to grip surfaces of magnetic work material and support the drill mount thereon when said winding is energized, said outer pole face having at least one selected part thereof enlarged in the core's radial direction and the other part of said outer pole face being narrowed in the radial direction so that the major part of the magnetic flux threads through said enlarged part when the drill mount is supported by said base on a magnetic work material surface that is only approximately as wide as the circumferential length of said enlarged part, said circumferential length being substantially shorter than the width of said base magnet.

2. In a magnetic drill mount for use on magnetic work surfaces that are curved or not as wide as the base of the drill mount, the combination as set forth in claim **1**, further characterized in that said outer pole face is provided with diametrically opposed enlarged areas.

3. In a magnetic drill mount for use on magnetic work surfaces that are curved or not as wide as the base of the drill mount, the combination as set forth in claim **1**, further comprising a stabilizer leg, means attaching said leg to said post spaced well to the rear of said post, said electric drill being mounted on said post to the front thereof and said enlarged area of said outer pole face and said central pole face being located on an axis passing through said stabilizer leg and the drill bit of said electric drill.

4. In a magnetic drill mount for use on magnetic work surfaces that are curved or not as wide as the base of the drill mount, the combination as set forth in claim **2**, further comprising a stabilizer leg, means attaching said leg to said post spaced well to the rear of said post, said electric drill being mounted on said post to the front thereof and said enlarged areas of said outer pole face and said central pole face being located on an axis passing through said stabilizer leg and the drill bit of said electric drill.

5. In a magnetic drill mount for use on magnetic work surfaces that are curved or not as wide as the base of the drill mount, the combination as set forth in claim **2**, further characterized in that circumference of said outer pole is substantially circular except that the parts of said outer pole corresponding to said enlarged areas bulge outward therefrom.

References Cited

UNITED STATES PATENTS

935,291	9/1909	Boenig	77—59
1,010,975	12/1911	Stronger et al.	77—59

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