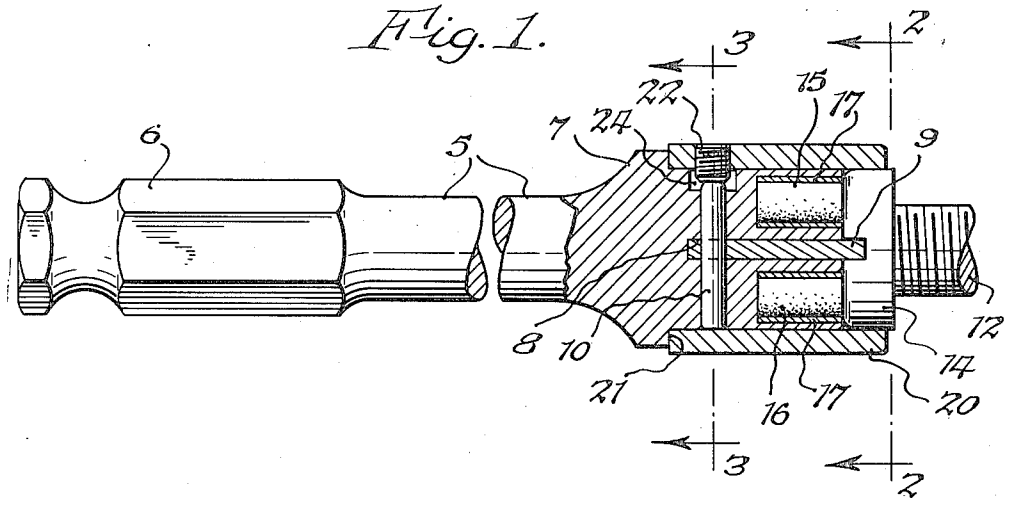
Feb. 26, 1957 F. G. CLARK 2,782,822

MAGNETIC SCREW DRIVERS

Filed May 22, 1953

Fig. 1.



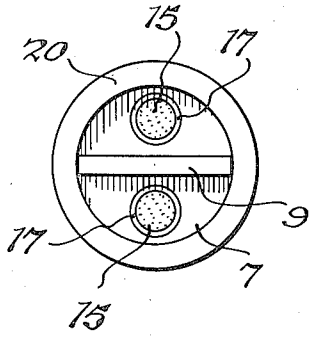


Fig. 2.

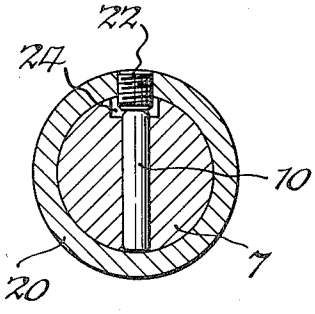


Fig. 3.

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MAGNETIC SCREW DRIVERS

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5 Claims. (Cl. 145—50)

This invention relates to improvements in screw drivers of the magnetic type in which a workpiece such as a screw or the like is held by magnetic force in correct relation to a screw driver bit to facilitate the placing of the workpiece into position to be driven.

One of the objects of this invention is to provide a magnetic tool of this type which is particularly constructed to cooperate with screws having heads of relatively large sizes. Another object is to provide a magnetic screw driver with a low cost bit of novel construction which can be readily removed from the screw driver and replaced by another bit and which may be made of a magnetic material. A further object is to provide a screw driver of this type in which a magnet is arranged at a side of the bit. Another object is to provide a screw driver of this type with a sleeve within which the end of a screw may be centered relatively to the screw driver.

Other objects and advantages will be apparent from the following description of one embodiment of the invention and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawings:

Fig. 1 is a fragmentary side view, partly in section, of a magnetic screw driver embodying this invention.

Fig. 2 is an end view thereof, taken approximately on line 2—2, Fig. 1.

Fig. 3 is a transverse sectional view thereof, on line 3—3, Fig. 1.

In the particular embodiment of the invention, 5 represents the shank of the screw driver which may be of any suitable or desired construction, that shown having a hexagonal portion 6 adapted to cooperate with a shank holding mechanism of a power tool for rotating the screw driver. It will be understood, however, that this shank may be of any other form and may be provided with a handle for manual use.

The shank preferably terminates at its outer end in a substantially cylindrical enlargement 7 which has a transversely extending diametrical slot 8 formed to receive a bit 9 in such a manner that one end of the bit extends beyond the outer end of the enlargement into position to engage a slot in a screw or other fastening. The screw driver bit 8 may be held in operative relation to the enlargement 7 of the shank in any suitable or desired manner, for example, by means of a pin 10 arranged in a hole extending crosswise of the enlarged end of the shank 7 and through a hole formed in the inner end of the bit 9.

12 represents by way of example one type of screw with which my improved magnetic screw driver may cooperate, the screw having a relatively large head 14 with a slot extending crosswise of the same and into which the outer end of the bit 9 may enter. While I have shown my screw driver for use with slotted screws, it will be obvious that the outer end of the bit 9 may be of any suitable shape or construction so as to cooperate with screw heads having means other than a slot for turning the same.

The end or enlargement of the shank of the screw driver may be provided with one or more magnets arranged at one or both sides of the screw driver bit in spaced relation thereto and positioned so as to engage or extend into very close proximity to the heads 14 of screws to hold the same on the outer or enlarged end of the shank. In the construction shown by way of example, I have provided a pair of magnets 15 and 16 which are arranged in holes drilled in the end of the enlargement 7 of the shank. If the enlargement is made of a material which is substantially non-magnetic, such for example as a stainless steel, the magnets 15 and 16 may be fitted directly into the holes drilled in the end of the enlargement. If, however, the enlarged or outer end 7 of the shank is made of a material which is readily permeable by magnetism, such as most ordinary steels, then a bushing 17 is arranged about each magnet, the bushing being made of any suitable non-magnetic material through which magnetism will not be readily conducted. This material need not necessarily be a metal. The magnets are ordinarily magnetized lengthwise of the same in the same manner as bar magnets. If two such magnets are used, then the magnets are preferably so arranged that the outer faces thereof are of opposite polarity. This is particularly desirable if the end or enlargement 7 of the shank is made of a material permeable to magnetism, since in that case, the two magnets have their inner ends connected by permeable material so that they constitute in effect a magnet of the horseshoe type. In such case, the head 14 of the screw would constitute a keeper extending across the outer faces of the two magnets. However, as stated it is not necessary that two magnets be employed, since in many instances, a single magnet has sufficient strength to retain a screw or other fastening device in correct relation to the end of the enlargement of the shank, this being particularly the case when the magnets are of a high power type such for example as those made of Alnico. However, the screws are much more firmly held on the screw driver if magnets are arranged at opposite sides of the bit.

Preferably a sleeve 20 is provided which extends about the outer end or enlargement 7 of the screw driver, this sleeve being of such diameter as to extend about the periphery of the head 14 of a fastening device. The enlargement of the shank is preferably provided with an annular shoulder 21 against which the inner end of the sleeve 20 may bear, and the sleeve may be held in operative relation to the screw driver in any suitable manner, for example, by means of a headless set screw 22 extending through a threaded hole in the side of the sleeve in position to engage the enlargement of the shank. Preferably this screw engages the pin 10 which holds the screw driver bit 9 in place, and in the construction shown, a shallow recess 24 is provided in the enlargement 7 of the shank at one end of the hole through which the pin 10 extends. When the screw 22 is tightened, it tends to urge the pin 10 against the inner face of the sleeve 20 at the side thereof opposite to that through which the screw 22 extends, and consequently, the sleeve is held firmly in place, not only by the screw 22 but also by pressure of the pin 10 against the opposite end of the sleeve. While the sleeve shown has a cylindrical bore of uniform diameter, it will be obvious that if the screw driver is to be used on screws of larger or smaller diameters, the sleeve may have the bore at the portions thereof extending beyond the end of the shank made of corresponding diameter. The sleeve also serves to hold the bit against shifting in the slot 8.

The construction described has the advantage that the head of a screw or other fastening may be readily located in correct relation to the screw driver by inserting the same into the outwardly extending end of the sleeve and turning the same so that the screw driver bit 9 extends into the slot of the screw. If the screw driver bit be-

comes worn out, it can readily be replaced by another bit by first removing the set screw **22** and the sleeve **20** and then driving out the pin **10**, whereupon the bit may be removed out of its slot in the shank. The bit and the sleeve **20** may be made of any desired material, such as a high grade tool steel.

The screw driver described has the advantage that it can be easily manufactured and its construction makes it possible to use magnetic steels, thus permitting the use of high carbon or alloy tool steels. The bit is in the form of a flat blade which is much less expensive to produce than bits of the type commonly used in power operated screw drivers.

Since power tools for driving large screws are necessarily quite heavy, the construction described enables the operator to use both hands to support and guide the tool, since he is not required to hold the screw by hand. This is also of advantage when driving screws having assembled thereon lock washers with sharp projections, which are very apt to cut the hands of operators when they start or hold this type of screw by hand. Also by means of the construction described, the magnets are so positioned as to be protected to the maximum extent against damage by the fastenings.

It will be understood that various changes in the details, materials, and arrangements of parts which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

I claim as my invention:

1. A magnetic screw driver comprising a shank having the outer end thereof provided with a diametrically extending slot, a flat screw driver bit of a magnetic material extending into said slot and having the outer end thereof extending beyond said shank for engagement with a slot in a screw head, said shank and bit having registering holes extending crosswise of said shank, a pin extending through said holes for holding said bit on said shank, a sleeve extending about and secured to the outer end of said bit and having a portion thereof extending beyond said end of said bit, said shank also having a pair of longitudinally extending holes extending inwardly from the outer end thereof at opposite sides of said slot, and a magnet in each of said holes having its outer end terminating at the outer end of the shank in spaced relation to said bit for holding a screw within the outer end of said sleeve and in engagement with said bit.

2. A magnetic screw driver according to claim 1, characterized in that said sleeve is held on said shank by means of a set screw arranged in a threaded hole in said sleeve in position to engage an end of said pin to urge the same against the opposite face of said sleeve.

3. A magnetic screw driver comprising a shank having the outer end thereof provided with a diametrical slot, a flat screw driver bit made of a magnetic material and secured in and supported by the sides of said slot substantially throughout its length, and having the outer end thereof extending beyond said shank for engagement with a screw head, said shank having a longitudinally extending hole in the end thereof arranged entirely at one side of said slot, a magnet in said hole and having its outer end positioned to engage a screw at one side only of said bit to hold the screw in operative position on the end of said shank, said shank being made of a magnetic material, and a bushing of non-magnetic material extending about said magnet within said hole.

4. A magnetic screw driver comprising a shank having the outer end thereof provided with a diametrical slot, a flat screw driver bit made of a magnetic material and secured in and supported by the sides of said slot substantially throughout its length, and having the outer end thereof extending beyond said shank for engagement with a screw head, said shank having a longitudinally extending hole in the end thereof arranged entirely at one side of said slot, a magnet in said hole and having its outer end positioned to engage a screw at one side only of said bit to hold the screw in operative position on the end of said shank, a sleeve removably secured to said shank and extending about said bit and having a part extending beyond the outer end of said shank for confining the screws in operative relation to said screw driver, and a holding member securing said bit on said shank and held in its operative position by said sleeve.

5. A magnetic screw driver comprising a shank having the outer end thereof provided with a diametrical slot, a flat screw driver bit made of steel and secured in and supported by the sides of said slot substantially throughout its length, and having the outer end thereof extending beyond said shank for engagement with a screw head, said shank having longitudinally extending holes in said end thereof at opposite sides of said slot, a magnet in each of said holes, said magnets having their outer ends thereof positioned to engage a screw to hold the same in position on the end of said shank, said shank end being made of magnetic material and said magnets being so arranged in said holes that the outer ends of the magnets are of opposite polarity, and bushings of non-magnetic material extending about said magnets within said holes.

References Cited in the file of this patent

UNITED STATES PATENTS

1,587,647	Hoode et al.	June 8, 1926
2,218,631	West	Oct. 22, 1940
2,260,055	Reardon	Oct. 21, 1941
2,597,876	Kurkjian	May 27, 1952