April 18, 1933. C. A. HARGROVE 1,904,224

ELECTROMAGNETIC TOOL

Filed May 3, 1932

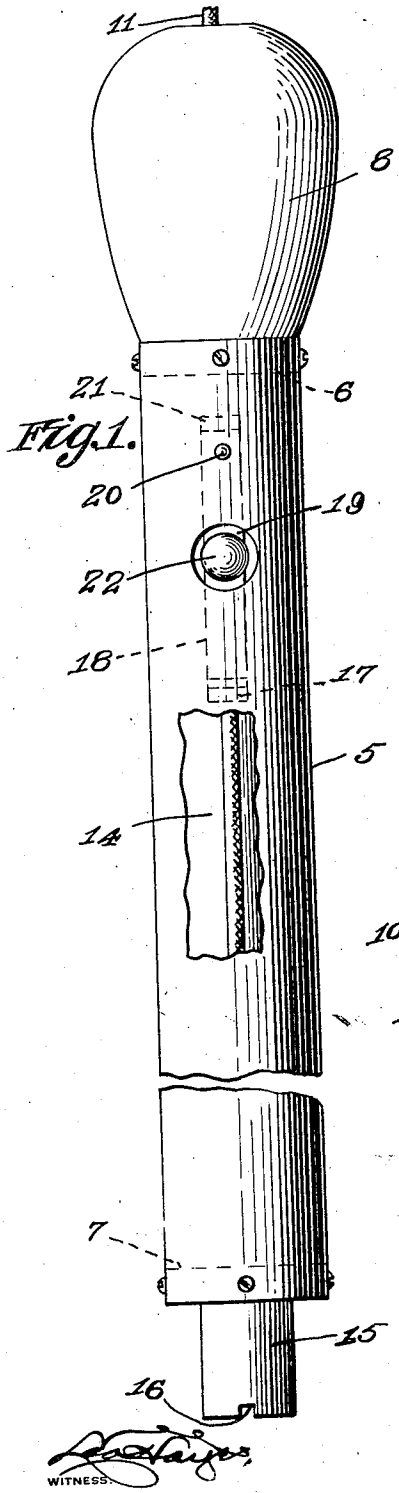


Fig. 1.

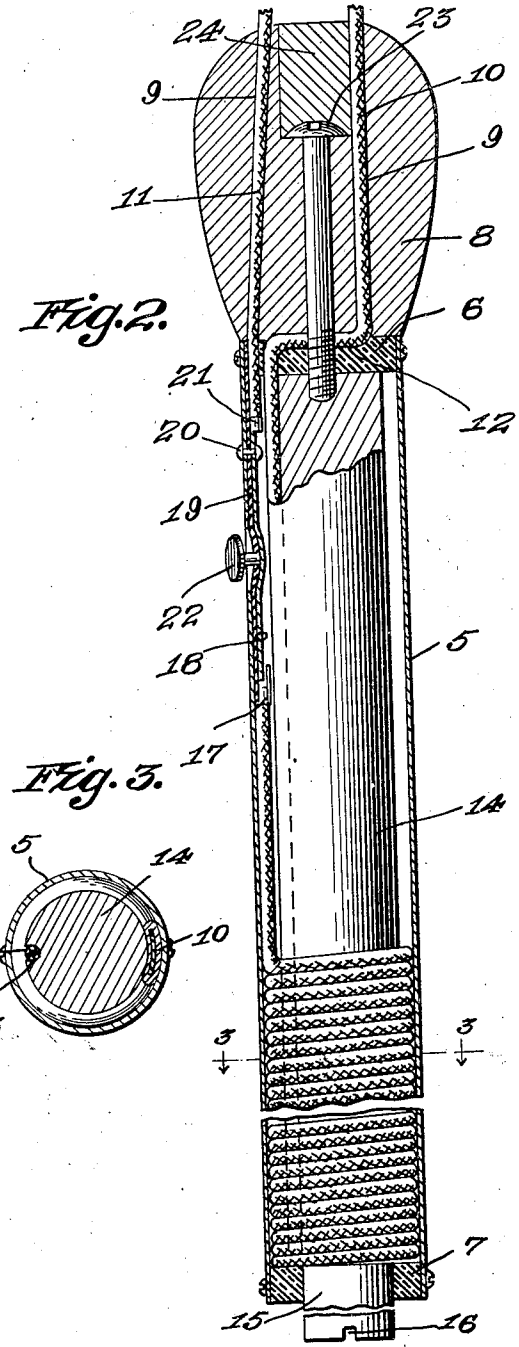


Fig. 2.

Fig. 3.

WITNESS:

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ELECTROMAGNETIC TOOL

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The invention relates to a hand tool and more particularly to an electromagnetic tool.

The primary object of the invention is the provision of a tool of this character wherein the construction thereof is such as to enable its use for pulling broken axles from the axle housings in automobiles or the like. Ordinarily considerable time is consumed in extracting or pulling broken axles, as for example, from thirty minutes to three and one-half hours and in the use of the present invention such work can be successfully performed in less than two minutes.

Another object of the invention is the provision of a tool of this character wherein electric energy is consumed only when it is in use and the same may be permanently connected in circuit with a source of electric supply such as a battery or electric current from a power plant, the tool in its entirety being of novel form and the core or magnet extends within the handle to the tip of said tool and is firmly concealed and housed and is rigid and of a construction so as to give a pulling power of maximum degree.

A further object of the invention is the provision of a tool of this character wherein the magnet or core is so housed or confined to avoid contact with any magnetizing material or iron except at the tip or at that point available for pulling operation thereof.

A still further object of the invention is the provision of a tool of this character which is extremely simple in construction, thoroughly reliable and efficient in its purpose, strong, durable, compact and inexpensive to manufacture.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawing, which discloses the preferred embodiment of the invention, and pointed out in the claim hereunto appended.

In the accompanying drawing:—

Figure 1 is an elevation of the tool constructed in accordance with the invention, the outer shell or casing of its handle being partly broken away.

Figure 2 is a vertical longitudinal sectional view through the tool.

Figure 3 is a sectional view on the line 3—3 of Figure 2 looking in the direction of the arrows.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

Referring to the drawing in detail, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 5 designates a tubular casing or shell, preferably made from non-magnetic material, such for example as aluminum, although the same may be made from any other thin non-magnetizing material and has fitted in opposite ends heads 6 and 7 respectively, these being preferably of insulating material and associated with the head 6 is a handle knob 8, preferably made from wood, the latter being bored to provide passages 9 for insulated electric current wires 10 and 11 respectively, while the head 6 is formed with a channel 12 for the countersinking of the wire 9, the latter being trained through a groove 13 toward the head 7 and wound externally in a reverse direction upon a magnet or core 14 arranged between the heads 6 and 7 and within the casing 5.

The core is formed with a reduced working tip 15 having a transverse slot 16 in its outer end and this tip is fitted within a suitable central opening in the head 7 to project the required distance externally of the casing or shell 5.

The wire 10 has a contact terminal 17 for coaction with a switch blade 18, the latter insulated at 19 from the casing or shell 5 and is riveted to the latter at 20. This switch blade 19, through the connector 21, is joined with the wire 11 externally of the casing 5. The switch blade carries a push button 22 projected exteriorly of the casing in convenient reach of the user of the tool. The switch blade 19 is normally open and upon depressing the button 22 it will engage with the contact 17 for the closing of the circuit through the wires 10 and 11 so that the core or magnet 14 will be electrically energized in the use of the tool for pulling purposes, for ex-

ample, for pulling broken axles from axle housings in automobiles or the like. The magnet 14 is applied to the work at the tip 16 of said magnet.

The handle knob 8 is made fast to the head 6 through the medium of a central securing bolt 23 countersunk within the knob 8 and the countersink being plugged at 24, the bolt being threaded into the head 6.

It will be seen that the tool is readily and easily manually manipulated and through the switch button 22 the electric circuit can be readily opened and closed to deenergize and energize the magnet 14 and when energized the working tip 16 can be applied to a piece of work for operation thereon.

What is claimed is:—

An electro-magnetic tool comprising a tubular casing made from non-magnetic material, end heads fitted in opposite extremities of the casing and made from insulating material, a handle abutting one end head, a fastener countersunk in the handle centrally thereof and secured in the end head adjacent thereto, a magnetic core arranged interiorly of the casing between the end heads and engaged at its inner end by said fastener and having an outer reduced end projected exteriorly of the casing, said handle having passages and likewise the end head next thereto leading to one side of the core between the same and the casing, electric current wires of a normally open circuit trained through the passages and forming a coil about the core next to its reduced outer end and confined by the casing, said core having a channel accommodating one of the current wires, and a push button switch carried by the casing and operated exteriorly thereof and included in the circuit for the closing thereof, said switch being disposed close to the handle.

In testimony whereof I affix my signature.

CLARENCE A. HARGROVE.