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MAGNETIC SHAVING COLLECTOR FOR DRILLS

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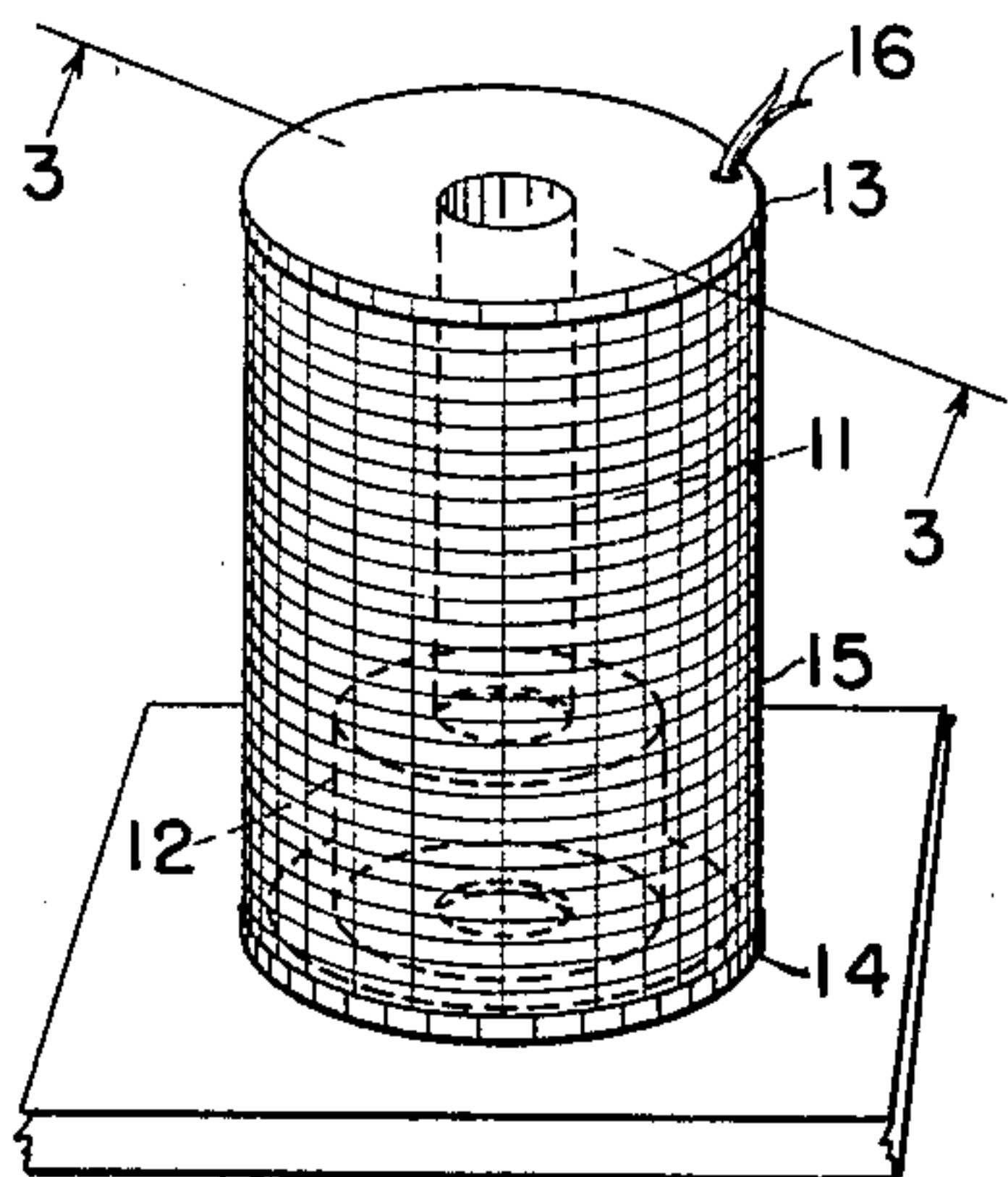


FIG. 1

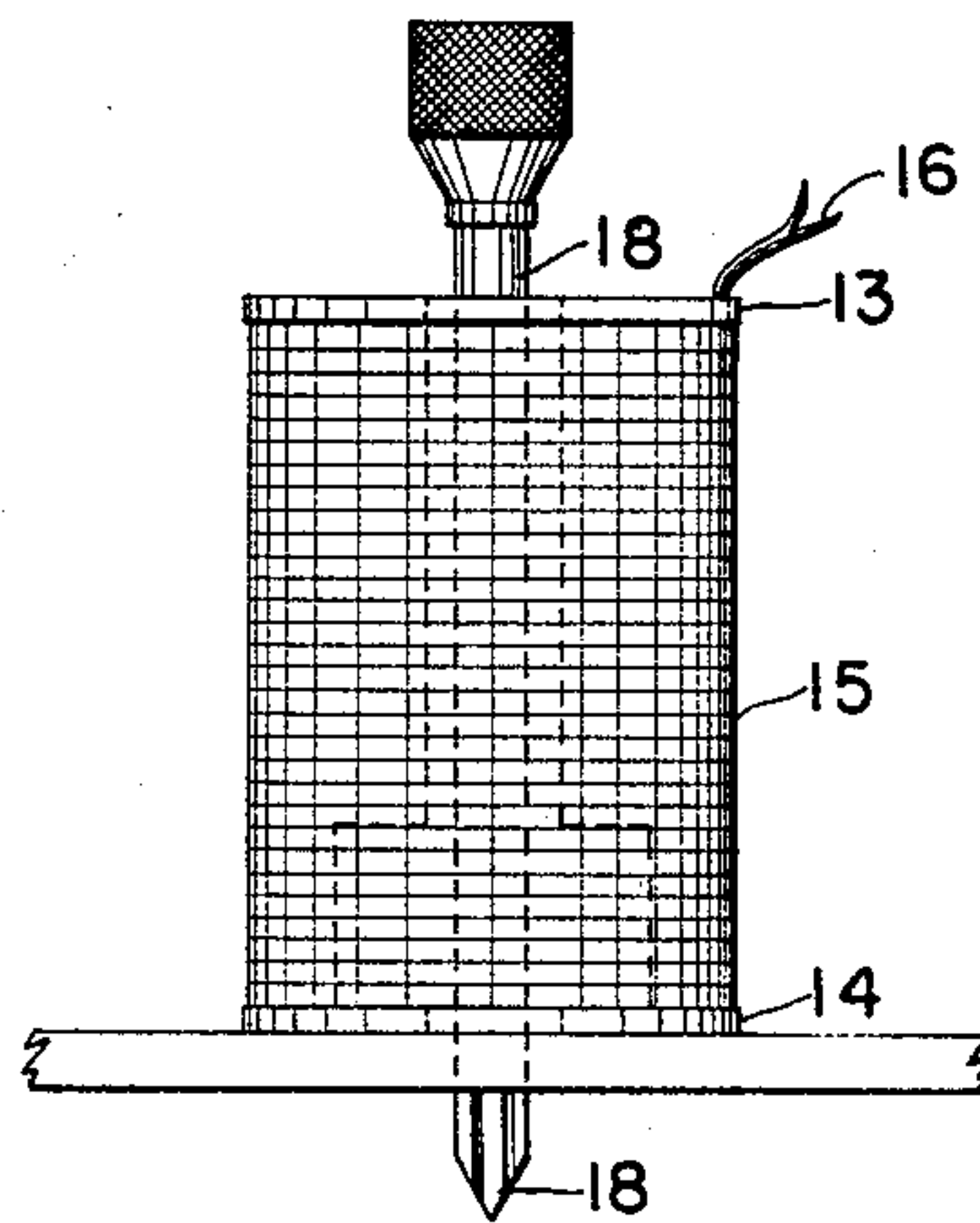


FIG. 2

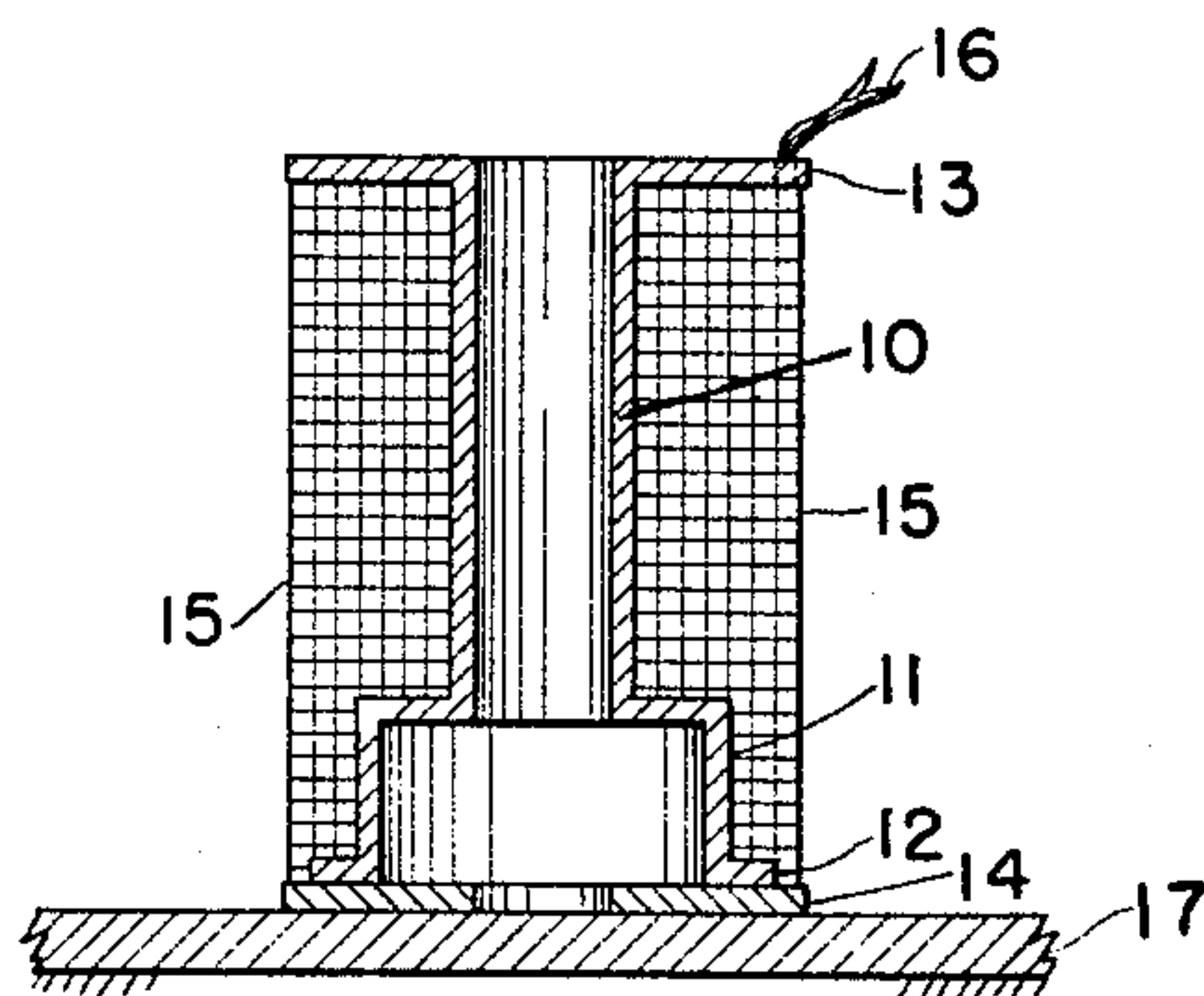


FIG. 3

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MAGNETIC SHAVING COLLECTOR FOR DRILLS

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1 Claim. (Cl. 77—55)

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This invention relates to a magnetic shaving collector for drills and more particularly to an electromagnetic shaving collector for drills having an internal recessed portion for the collection and retention of drilled particles or shavings.

When holes are drilled through metal surfaces with a conventional rotating drill, particles of metal are carried into the opening and due to the rotational action of the drill these particles are forced down through the hole into the space below. This is highly undesirable when working on articles such as internal combustion engine blocks or machinery casings due to the fact that any particles of metal shavings falling into the internal parts are likely to damage the highly machined surfaces.

Further, if the shavings are permitted to pile up immediately adjacent the drill opening there is almost a certainty that a portion of the shavings will fall into the opening at some time during the repair, or upon removal of the drill. The prior art fails to provide a magnetic drill collector which attracts and collects the shavings away from the drill hole opening.

One of the objects of this invention is to provide a magnetic collector which attracts and retains metal drill shavings away from the vicinity of the drill opening.

Another object of this invention is to provide a magnetic collector so arranged as to confine the collected drill shavings within the collector away from the surface of the drill.

Also an object of this invention is to provide a magnetic collector which may be readily utilized with any conventional drill.

A further object of this invention resides in the particular construction whereby my magnetic collector may easily be fabricated from a minimum number of parts.

Other and further objects and advantages of my invention will be apparent from the following description taken in conjunction with the accompanying drawings in which like characters of reference designate corresponding parts throughout the several views, and wherein:

Fig. 1 is a perspective view of an embodiment of my invention.

Fig. 2 is a side view of the embodiment of Fig. 1 and with an ordinary twist drill inserted therein.

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 1.

Referring to the particular embodiment of my invention chosen for illustration, an inside core comprises a hollow tube member 10, preferably

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constructed from brass or other non-magnetic material, which terminates at its lower end in an enlarged cylindrical collection and retention chamber 11. Chamber 11 is a continuation of the hollow portion of the tube 10 but is enlarged circumferentially from the center line of the tube 11, and the bottom edge of the chamber 11 is flared outwardly forming a circular bottom flange attaching member 12.

The upper terminal edge of the tube member 10 is flared outwardly to form a flat disc-like top member 13 which has an opening permitting the insertion of a drill; and a bottom disc-like member 14, with a drill opening in the center, is soldered or riveted or otherwise secured to the circular bottom attaching member 12.

As can be readily observed, the entire organization of tube member 10, chamber 11, top member 13, and bottom member 14, together in place form a spool-like construction having a through opening along the longitudinal center line. Chamber 11, which is adjacent the bottom drill opening, is somewhat larger and has its side walls offset from the bottom opening.

Wound around the center core, in the same manner as thread is wound upon a spool, is a continuous length of solenoid type wire 15 which completely encompasses the tube member 10 and the outside of chamber 11 and is wound upon itself for a definite predetermined number of turns, and finally passes up through top member 13 and terminates in a loose wire connector 16. This winding, when energized with electricity, forms a magnetic attraction about the walls of the chamber 11 which construction is more generally referred to as a solenoid. The size of the wire and the number of turns of wire to be used is a simple problem of electricity dependent upon whether alternating or direct current is used and the voltage thereof.

My device is so constructed that it may be readily fabricated from a minimum of easily obtainable parts in a minimum of operations by beginning the fabrication with an elongated brass tube member of approximately the size and shape of the core tube member 10. As is readily seen in Fig. 3, the upper portion of the basic tube member is formed to make the flat disc upper member 13 while at the same time the lower portion of the tube member is expanded to form the chamber 11 with the flat circular attaching flange 12 and then it is only necessary to provide the pre-cut lower disc member 14, which may be easily punch pressed from flat metal stock, on

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the flange 12 by electric welding, soldering or any other suitable means. Thereafter, the assembled spool is wound with the required number of turns of the wire 15 and my magnetic shaving collector for drills is finished and ready for operation.

In operation, my invention is placed with the bottom disc member 14 flat against the surface to be drilled, such as a metal surface 17 in Fig. 3. The loose connector wire is attached to any suitable available electric power source which energizes the coil of wire to form a magnetic field around the core, and then the required drill, such as 18 in Fig. 2, is inserted through the opening in the core and thereafter drilled into the metal surface 17. As the loose metal shavings are produced by the drill, they are attracted into the chamber 11 which is offset from the drill hole and is wholly within the core, according to my invention, and the metal shavings are retained there inside chamber 11 until after the drilling is completed and the drill has been removed from the opening in the core. The collector is then removed from the vicinity of the drilled surface 17 while the power is still energizing the wire 15, and the power is then shut off which causes the small shavings to drop from the core.

The entire structure may be fabricated from light material. This makes my invention easy to handle and readily shiftable from one location to another and also permits it to be stored along with the drill parts.

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It will be obvious to those skilled in the art that many modifications and changes may be made in the embodiment shown and described without departing from the scope of the invention as defined in the appended claim.

I claim:

In a magnetic shaving collector for drills, a tubular central member having flared ends, an annular offset portion adjacent one end of said tubular central member forming a chamber for the reception of shavings from a drill, means adjacent said end of said tubular central member partially closing the outer end of said chamber, said means being provided with an opening in axial alignment with said tubular central member for the passage of a drill therethrough, and means surrounding said tubular central member for setting up a magnetic field about said tubular central member to draw shavings from said drill into said chamber.

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The following references are of record in the file of this patent:

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