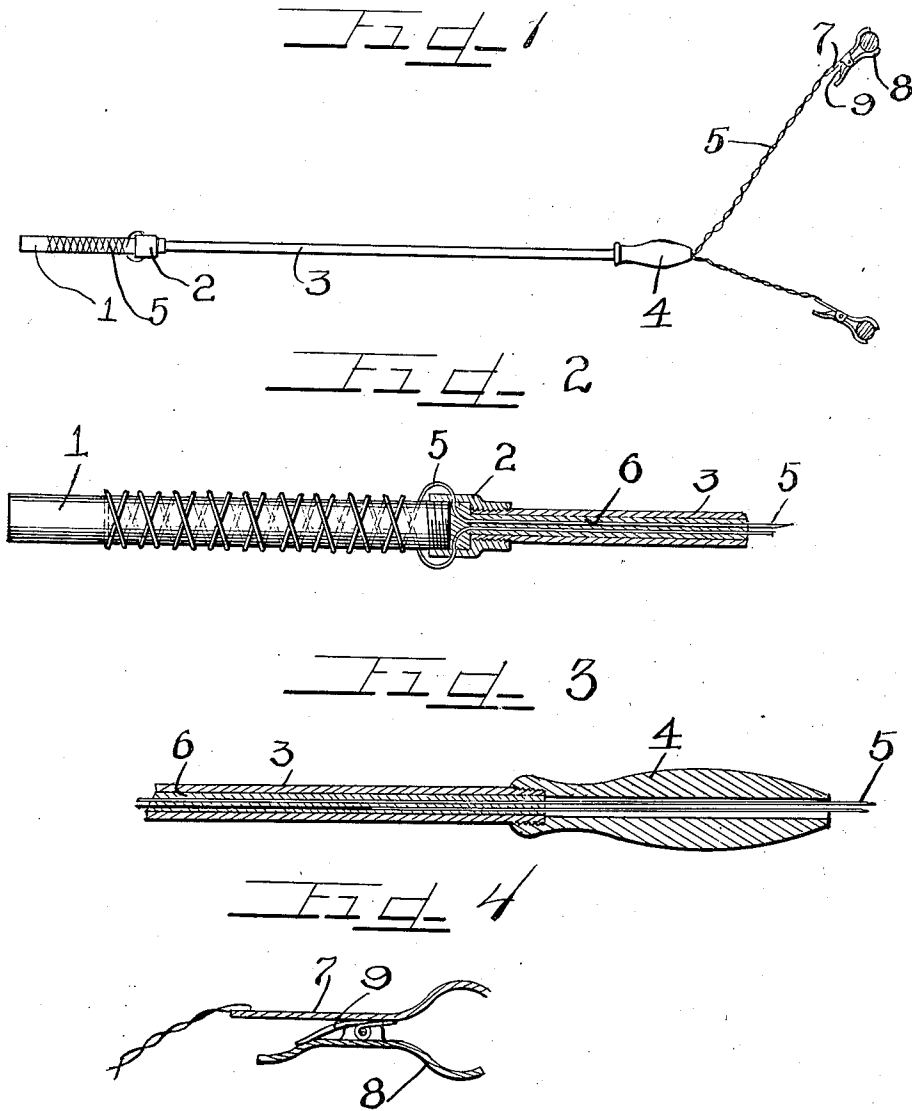


C. G. MILLER.  
 ELECTROMAGNETIC GRAPPLING TOOL.  
 APPLICATION FILED MAY 12, 1910.

999,833.

Patented Aug. 8, 1911.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

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## ELECTROMAGNETIC GRAPPLING-TOOL.

999,833.

Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed May 12, 1910. Serial No. 560,909.

*To all whom it may concern:*

Be it known that I, CONSTANTINE G. MILLER, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electromagnetic Grappling-Tools; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numbers of reference marked thereon, which form a part of this specification.

In electro-plating machines, and no doubt many other devices wherein articles of magnetic materials are to be treated or operated upon, as, for instance, plated, it frequently occurs that some of such articles or devices become dislodged from the normal support therefor and fall to the bottom of the receptacle or tank and it sometimes becomes a matter of considerable difficulty to engage and remove the same therefrom. This is particularly true in machines for plating iron and steel articles, and inconvenience, delay and annoyance are frequently occasioned by the difficulty experienced in emptying the tank after the completion of the run upon any one article. Owing to the fact that such articles may be of almost any shape, it becomes frequently very difficult for ordinary grappling devices to engage the same and heretofore it has frequently been practically impossible to remove all such devices and articles from the tank until the completion of the day's run.

The object of this invention is to provide an electro-magnetic grappling tool, by the use of which any article of a magnetic nature may be quickly and readily engaged and lifted from the tank.

It is also an object of the invention to utilize a part of a plating current for the purpose, and also to afford a grappling tool of the class described, which may be quickly attached to, or detached from, the leads, thus permitting the widest possible range of use of the tool at any desired point in the tank, permitting quick detachment to enable the device to be used for one or more tanks.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claim.

In the drawings: Figure 1 is a side elevation of a device embodying my invention

with the coil shown somewhat diagrammatically. Fig. 2 is an enlarged view with the shank or handle broken away and in longitudinal section. Fig. 3 is a longitudinal section of the upper or outer portion of the handle. Fig. 4 is a longitudinal section of one of the grips for engaging the lead wire.

As shown in the drawings: a bar of soft steel or iron 1, (which may be of any cross sectional form, but is shown as cylindrical) is threaded into the larger end of the reducing coupling 2, in the smaller end of which is threaded a metal pipe 3, of the length desired for the body and on the upper end of which is provided a wooden or other suitable hand grip 4, for conveniently actuating the same.

Extending downwardly through the tubular body 3 is a conducting wire 5, which extends outwardly through apertures in the coupling at the inner end of the bar or rod 1, as shown in Fig. 2, and is wound about said rod or bar of soft metal or steel to afford a coil of any desired number of turns and the return end thereof is passed inwardly through an oppositely disposed aperture in said coupling and thence led upwardly through the body 3 and handle 4. Insulating paint such as P. B. paint, melted wax, or any suitable material is then poured into the tubular body 3 to fill the same for a desired distance and to entirely seal the wires in said coupling and body from injury from the electrolyte. Such filling material, indicated by 6, is clearly shown in Figs. 2 and 3. Each end of said wire conductor 5, is provided with a metallic gripping device for engaging the leads whereby the current is supplied to the anodes and cathodes in the tank to complete the circuit through the coil. For this purpose, as shown, a metallic snap is permanently secured on each end of said conductor wire and comprises, as shown, a metallic plate or member 7, having a curved or suitably shaped jaw to fit to the conductor or bus bar. As shown, a complementary member 8, is pivotally engaged at its middle thereto and provided with a suitably shaped jaw and a spring 9, is engaged on the pintle affording a connection between said members and acting to hold the jaws firmly closed so that when once engaged in place upon the conductor a positive contact is assured.

The operation is as follows: When it is

desired to clear the tank of such objects or articles as may have fallen to the bottom therein, the ends of the conductor wire are connected by means of the snap secured to each, to the leads or conductors for the tank and in consequence the comparatively weak current flows through the coil, converting the bar of soft metal 1, into a temporary magnet, which, of course, is of sufficient power to engage and lift the objects to be removed from the tank. The grappling tool is, of course, manipulated by its handle, and having cleared one portion of the tank, one or both of the snaps may be released and connected elsewhere on the conductors to an anode and cathode element of the tank at any convenient point for best operation and in this manner any part of the tank is readily accessible and the same tool may be used on one or more tanks if desired, without inconvenience.

Inasmuch as the conductors are inclosed within the body of the tool and in the insulating wax or paint filling said body, it follows they are protected from all injury rendering the grappling tool exceedingly durable as well as effective.

Of course, I have shown but one (and that the preferred) form of my invention. I am

aware that the particular shape of the magnetic head of said tool may be varied and various features of construction may be modified without departing from the principles of this invention. I therefore do not purpose limiting myself otherwise than necessitated by the prior art.

I claim as my invention:

An electro-magnetic grappling tool, embodying a soft metal bar, a tubular body, a reducing coupling connecting the two and into which each is threaded, a handle on the outer end of said body, an insulated wire wound about said bar to form a coil and having the ends thereof led through apertures in said coupling and into and through said body and handle, an insulating filling in said body, and means on each projecting extremity of said wire coil to permit attachment to and release from the lead conductors for energizing said coil.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

CONSTANTINE G. MILLER.

Witnesses:

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LAWRENCE REIBSTEIN.