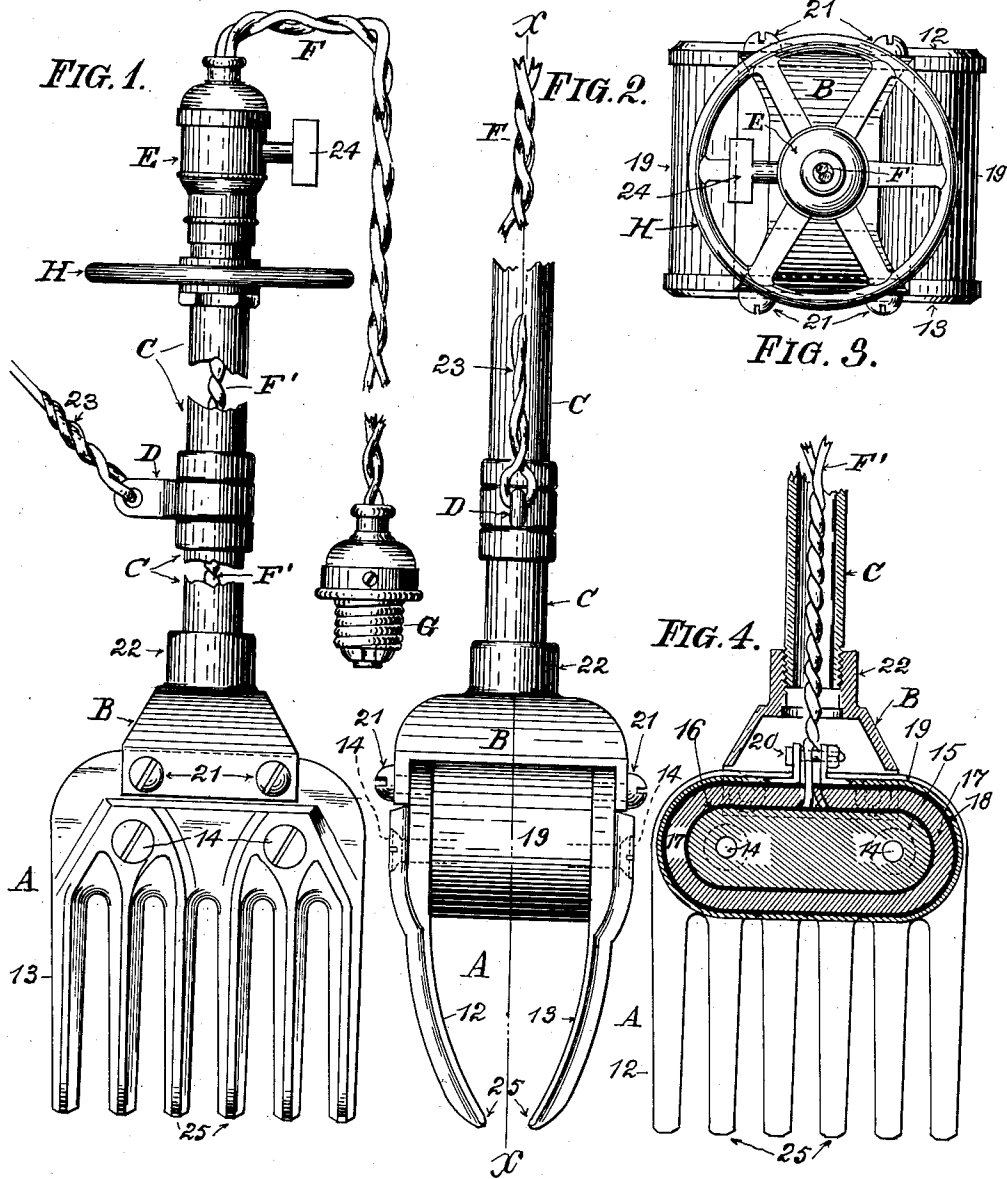


F. J. PHILLIPS.
ELECTROMAGNETIC SEPARATOR.
APPLICATION FILED MAR. 28, 1910.

966,855.

Patented Aug. 9, 1910.



Witnesses:

C. B. Knudsen,
A. S. Peterson

Inventor:

Frank J. Phillips,
By *Michael J. Stark & Sons,*
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK J. PHILLIPS, OF CHICAGO, ILLINOIS.

ELECTROMAGNETIC SEPARATOR.

966,855.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed March 28, 1910. Serial No. 552,027.

To all whom it may concern:

Be it known that I, FRANK J. PHILLIPS, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electromagnetic Separators; and I do hereby declare that the following description of my invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to improvements in electromagnetic separators; and it consists, essentially, in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

The object of this invention is the production of an efficient, serviceable, convenient, and comparatively inexpensive apparatus for separating ferrous substances from non-ferrous metals, and it is especially designed for removing iron and steel from copper, brass, bronze, aluminum and similar turnings.

It is a well-known fact that non-ferrous turnings such as are produced in machine-shops, brass-finishing shops, and other establishments, contain more or less ferrous substances resulting from the wear and breakage of steel tools, while operating on non-ferrous metals and also from ferrous articles being operated upon in the same machines in which non-ferrous goods are being produced. These mixed turnings, as they are commercially termed, command generally a considerably lower price per pound than those turnings from which the ferrous parts have been removed. By the employment of my electro-magnetic separator, I am enabled to remove from the mixed turnings all the ferrous matter at a trifling cost, so that the cleaned turnings will command the highest market price.

In the drawings already mentioned, which serve to illustrate this invention more fully, Figure 1 is an elevation of my improved electro-magnetic separator. Fig. 2 is a similar view of the same, the apparatus being turned at an angle of 90 degrees to that shown in Fig. 1. Fig. 3 is a plan, and Fig. 4 is a sectional view of a portion of the device, on line *x x* of Fig. 2.

Like parts are designated by corresponding symbols and characters of reference in all the figures.

This electro-magnetic separator comprises an iron basket, A, which may be magnetized by passing an electric current through a coil located between the members of said basket, and which will demagnetize as soon as the electric current is interrupted. This basket includes two, forked members 12, 13, which, by means of screws 14, are connected to an oblong iron core 15, Fig. 4, one at each end. This core is surrounded by an insulation 16, and upon this insulator is wound the wire constituting the coil 17, which winding is surrounded by an insulation 18, and the latter covered by a metallic jacket 19, to protect the coil from injury, said jacket being clamped to the coil by screws 20, and removable therefrom by removing said screws 20.

To the forked members 12, 13, there is secured a yoke B, by means of screws 21, which yoke terminates in a socket 22, which is internally screw-threaded to engage the similarly screw-threaded end of a tube C, which serves as a manipulating rod for this apparatus and to contain the electroconductor that leads to the coil. On this tube C there is a swivel D, by which, and a rope 23, the apparatus may be suspended from any overhead object to relieve the operator who actuates the same, from its weight.

On the upper end of the tube C there is located a switch-socket E, to which an electroconductor F, is connected, while a continuation F', of this conductor F leads from the switch-socket E to the winding 17 of the coil, and from the same, in the usual manner, the circuit being controlled by the switch-button 24. The cord F is of sufficient length to connect to a source of electricity by the plug G, Fig. 1.

Near the upper end of the tube C there is located a guard H, of any desired design adapted to protect the switch socket at the upper end of the tube C when the apparatus is placed against the wall or other object, not shown.

In operation, this device is pushed into a heap of turnings and an electric current sent to the spool or coil by turning the button 24. This will cause the magnetization of the forked members 12, 13, so that any ferrous matter with which the tines 25 come in con-

tact will adhere thereto, and which will drop from said tines as soon as the apparatus is withdrawn from the turnings and the current turned off. The tines 25 are inwardly bent at their lower ends and form, as it were, a basket which will contain quite a bulk of the ferrous substance, it being a fact that with an apparatus as described I have removed from a heap of brass turnings approximately 50 pounds of iron turnings at one picking.

The entire apparatus is comparatively simple, not liable to get out of order, and very efficient in its action.

I am aware that changes in the details of construction of this apparatus may be made without departing from the scope of my invention.

Having thus fully described this invention, I claim as new and desire to secure by Letters Patent of the United States—

1. An improved electro-magnetic separator, comprising, in combination, two members each of which is provided with a series of tines, said members being spaced in parallel relation, the said tines being inwardly bent and approaching one another, an electric coil interposed between said tined members, said electric coil having an oblong core with which said tined members are in conductive contact and to which said tined members are removably secured, a box-shaped yoke secured to said tined members, said yoke having an internally screw-threaded boss, a tube in screw-threaded engagement with said boss at one end, an electric switch at the other end of said tube, an electroconductor

connected to said switch, a further electroconductor connected to said switch and passing through said tube to said coil, a swivel on said tube, and an annular rim at the upper end of said tube, said coil being surrounded by a jacket having its ends connected by a fastening located in said yoke.

2. An improved electro-magnetic separator, comprising in combination, two members each of which is provided with a series of tines, said members being spaced in parallel relation, said tines being inwardly bent and approaching one another, an electric coil interposed between said tined members, said electric coil having an oblong core to the ends of which said tined members are removably secured and with which they are in conductive contact, a box-shaped yoke secured to said tined members, said yoke having an internally screw-threaded upwardly projecting boss, a tube in screw-threaded engagement with said boss at one end, an electric switch at the other end of said tube, an electroconductor connected to said switch, a further electroconductor connected to said switch and passing through said tube to said coil, said tube being of sufficient length to permit its being used as a handle to push the apparatus over the ground, as set forth.

In testimony that I claim the foregoing as my invention, I have hereunto set my hand in the presence of two subscribing witnesses.

FRANK J. PHILLIPS.

Witnesses:

LEON DORME,
MICHAEL J. STARK.