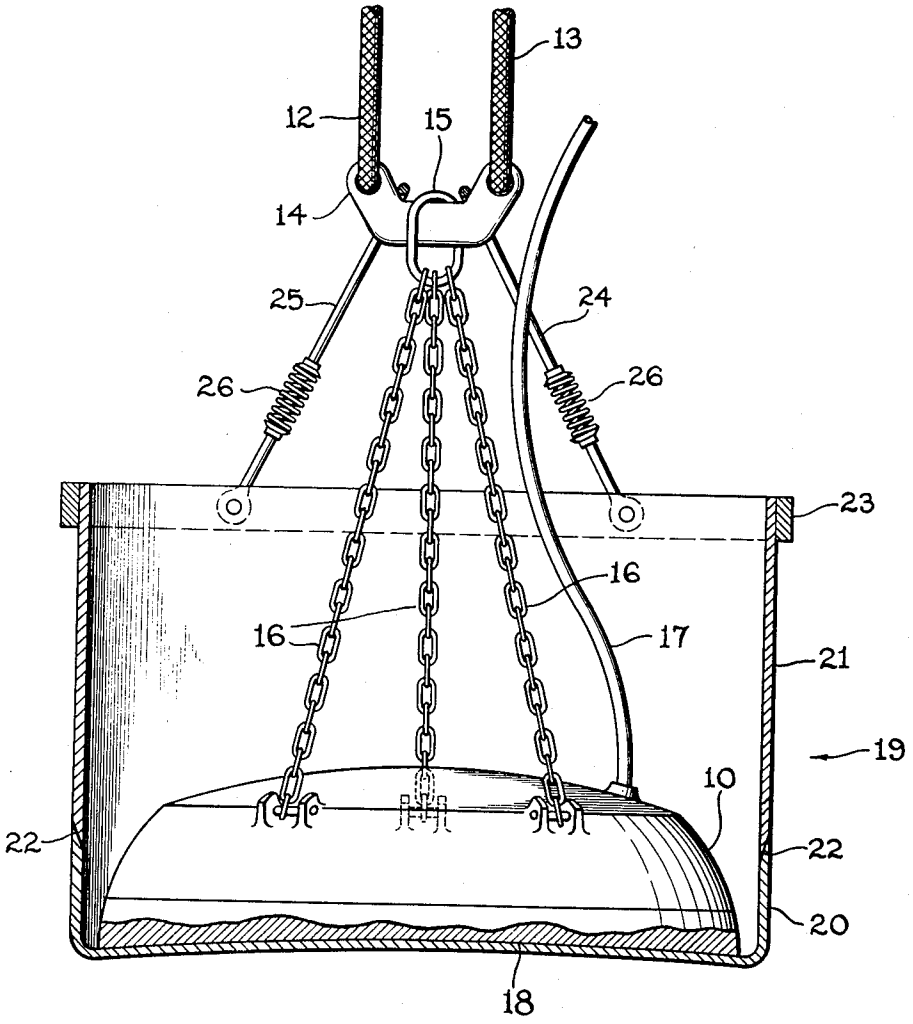
Nov. 7, 1950 R. F. WILLIS 2,529,440

SHIELD FOR ELECTROMAGNETS

Filed June 3, 1948



INVENTOR.
RALPH F. WILLIS
BY Donald G. Dalton
ATTORNEY

Patented Nov. 7, 1950

2,529,440

UNITED STATES PATENT OFFICE

2,529,440

SHIELD FOR ELECTROMAGNETS

Ralph F. Willis, McKeesport, Pa., assignor to National Tube Company, a corporation of New Jersey

Application June 3, 1948, Serial No. 30,887

2 Claims. (Cl. 294—65.5)

1

This invention relates to shields for electromagnets and particularly to shields for protecting electromagnets used in shallow water.

I am aware that heretofore electromagnets of the so-called "marine" type have been encased in sealed water-proof housings which enable them to be used under water. However, such magnets are unsatisfactory for applications in which they are subject to severe rough handling, such as in cleaning scale pits around steel mills. Rough handling may damage the water-proof seals and cause leaks that ruin the magnet.

An object of the present invention is to provide improved shields for electromagnets adapting the magnet to be used in shallow water and being capable of withstanding rough handling without developing leaks.

A further object of the invention is to provide improved electromagnet shields which are readily installed or removed from the magnets and which substantially conform to the contours of the magnet and do not materially affect the lifting characteristics.

A further object of the invention is to provide, in combination with an electromagnet, an improved shield which protects the magnet for use in shallow water despite rough handling and which does not substantially affect the lifting characteristics.

In accomplishing these and other objects of the invention I have provided improved details of structure, a preferred form of which is shown in the accompanying drawing, in which the single figure is a vertical sectional view of an electromagnet having an improved shield embodying features of the present invention.

In the drawing, there is shown at 10 an electromagnet, which is designed for lifting and transporting magnetic articles and is suspended from an overhead crane for this purpose. The suspending means illustrated comprises a pair of cables 12 and 13 carried by the crane, a yoke 14 to which the cables are attached and which carries a link 15. Magnet 10 is suspended from link 15 by a plurality of chains 16. The magnet is energized through an electric cable 17. The magnet is encased in a housing which is not necessarily water-proof and is illustrated as having a dished undersurface 18. Such structure is typical of electromagnets employed for lifting purposes, but obviously the shield of the present invention may be employed with magnets of different construction or having different suspending means.

The shield of the present invention comprises an open top, cylindrical container 19. The inside

2

diameter of the container is such as to receive magnet 10 freely. The height of the shield is greater than the depth to which the magnet will be submerged so that water does not enter the container through the open top. Preferably the container is formed in two sections, a bottom section 20 and a top section 21 welded together as at 22. Preferably the upper rim of the container has an annular reinforcing strip 23. The bottom of the container is shaped to conform with the dished underface of magnet 10 so that there is no open space between the bottom of the magnet and the container.

The shield is suspended from yoke 14 by a pair of slings 24 and 25 secured to reinforcing strip 23. Preferably slings 24 and 25 contain tension springs 26 which draw the container into close engagement with the bottom of the magnet.

In order that the magnet may release articles readily when it is de-energized, the shield is preferably of a material which has only slight residual magnetism. The material may be a non-magnetic material such as bronze, but I find that various steels which have low residual magnetism are satisfactory.

From the foregoing description it is seen that the present invention provides a shield which effectively protects electromagnets from water and yet is capable of withstanding rough handling without damage. The shield is readily removable from the magnet when it is not needed. Since the shield is fitted closely against the magnet, there is no substantial interference with the lifting characteristics.

While I have shown and described only a single embodiment of the invention, it is apparent that modifications may arise. Therefore, I do not wish to be limited by the disclosure set forth but only by the scope of the appended claims.

I claim:

1. A shield for protecting electromagnets used in shallow water comprising a cylindrical open top container of material having low residual magnetism, said container being adapted to receive freely an electromagnet, the configuration of the bottom of the container conforming to that of the bottom of the magnet, slings carried by the upper portion of the container adapted to suspend the container from a magnet suspending means and tension springs in said slings for drawing the bottom of the container into engagement with the magnet.

2. A shield for protecting electromagnets used in shallow water comprising a cylindrical open top metal container of two-piece welded construc-

tion and being of metal having low residual magnetism, said container being adapted to receive freely an electromagnet, the configuration of the bottom of the container conforming to that of the bottom of the magnet, a reinforcing strip carried by the upper edge of said container, slings joined to said container through said reinforcing strip adapted to suspend the container from a magnet suspending means, and tension springs in said slings for drawing the bottom of the container into engagement with the magnet.

RALPH F. WILLIS.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
906,599	Ahlm	Dec. 15, 1908
950,718	Eastwood	Mar. 1, 1910
2,239,750	Weeks	Apr. 29, 1941