

UNITED STATES PATENT OFFICE

GUSTAF W. ELMEN, OF LEONIA, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

NONMAGNETIC MATERIAL

No Drawing.

Application filed November 24, 1928. Serial No. 321,772.

The present invention relates to improvements in non-magnetic materials, and more particularly to the application of such materials to the armoring of submarine signaling cables.

It is an object of the invention to produce a new metallic non-magnetic composition having certain desirable physical properties.

It is a further object of the invention to armor a submarine signaling cable with such a material.

It has been discovered that the addition of about 3% molybdenum and a small, but substantial, amount of manganese to a non-magnetic composition containing about 25% nickel results in a material which is non-magnetic and in addition possesses high electrical resistivity, relatively high tensile strength and hardness, and relatively high resistance to corrosion and to abrasion.

It is known in the art that an alloy containing about 25% nickel and about 75% iron is non-magnetic in the ordinary condition. Alloys of this composition, however, have a comparatively low electrical resistivity, a relatively low tensile strength, a low resistance to corrosion and to abrasion, and for these reasons are unsuited for certain purposes.

Typical compositions of alloys in accordance with this invention contain from 25% to 30% of nickel, 1% to 4% of molybdenum, 0.05% to 0.5% of manganese and the balance iron. A specific composition containing approximately 25% nickel, 3% molybdenum, 0.15% manganese and the balance iron was tested magnetically and was found to have an initial permeability of 2.5, a maximum permeability of 3, an induction of 69 gauss for a magnetizing force of 40 gauss, and resistivity of 82.20 microhm-centimeters.

The magnetic susceptibility may be entirely suppressed in an alloy of this type by increasing the manganese content. Furthermore, its physical properties such as its ductility and toughness may be improved by increasing the molybdenum content or by adding from about 0.75 to 1.5% carbon.

These peculiar characteristics make the materials of the invention particularly use-

ful for certain purposes such as, for instance, the armoring of submarine signaling cables where a high resistivity, substantial or complete absence of magnetism, high tensile strength, toughness, and resistance to corrosion are of particular advantage.

What is claimed is:

1. A substantially non-magnetic material comprising between 20% and 30% of nickel, between 3% and 4% of molybdenum, a small but substantial amount of manganese and the balance iron.

2. A substantially non-magnetic composition containing about 25% nickel, 3% molybdenum, 0.15% manganese and the balance iron.

3. A cable armoring comprising an alloy in accordance with claim 1.

In witness whereof, I hereunto subscribe my name this 20th day of November, 1928.
GUSTAF W. ELMEN.

75

80

85

90

95

100