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BRUNO FETKENHEUER, OF BERLIN-REINICKENDORF, AND HANS NEUMANN, OF BERLIN, GERMANY, ASSIGNORS TO SIEMENS & HALSKE AKTIENGESELLSCHAFT, OF SIEMENSSTADT, NEAR BERLIN, A CORPORATION OF GERMANY

MAGNETIC ALLOY

No Drawing. Application filed May 7, 1928, Serial No. 275,955, and in Germany May 20, 1927.

Our invention relates to improvements in magnetic alloys, and its object is to produce a material the properties of which make it especially useful for the cores of transformers, Pupin or loading coils and the like, as well as a wrapping for conductors in order to increase their inductivity.

Magnetic alloys are already known which contain nickel and iron and show a high magnetic permeability at low magnetizing forces. It has been ascertained that the favorable magnetic properties of these alloys depend to a large extent upon the purity of the constituents employed.

It is, furthermore, generally necessary to produce these alloys in a vacuum furnace.

We have ascertained that by means of technically pure materials an alloy of good magnetic properties may be manufactured, by adding according to our invention about 5 to 20% of silicon to the alloy. An alloy which contains about 78% of nickel, 17% of iron and 5% of silicon has proved particularly useful. In all cases the nickel may entirely or partly be replaced by cobalt.

Alloys of this kind are very brittle and may therefore be easily pulverized. They have further a very high initial permeability and great magnetic stability as compared with other similar alloys known in the art. In particular in conductors equipped with coils having magnet cores of such alloys, the conditions are not noticeably varied by accidental magnetizations.

The most favorable magnetic properties of the alloys according to our invention develop after a suitable heat treatment, as in the case of the known alloys. For developing a high permeability our alloys are preferably annealed for a considerable time, say one hour at about 900° C. and then allowed to cool down slowly, say about 15 to 20 minutes, to about 625° C. The alloy is maintained at this temperature for 15 to 30 minutes, and is then cooled suddenly down to the room temperature, preferably in contact with air.

Various modifications and changes may be made without departing from the spirit and the scope of the invention, and we desired, therefore, that only such limitations shall be placed thereon as are imposed by the prior art.

We claim as our invention:

1. A magnetic alloy of high permeability at low magnetizing forces, containing 5 to 20% of silicon, 15 to 28% of iron and a balance of another element of the ferrous group.

2. A magnetic alloy of high permeability at low magnetizing forces, containing 5 to 20% of silicon, 15 to 28% of iron and 63 to 80% of nickel.

In testimony whereof we affix our signatures.

BRUNO FETKENHEUER.
HANS NEUMANN.