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MAGNETIC ALLOY

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This invention relates to magnetic materials formed of alloys in which the principal constituents are nickel and iron. In accordance with this invention we form such an alloy of nickel, iron, silver and manganese. Copper and silicon may also form constituents of the alloy. The addition of manganese with silver improves the working properties of the alloys in the process to which they are subjected during the manufacture of wire, strip or powder. In addition to giving improved working properties the manganese acts as a deoxidizer.

The silicon can be omitted or the constituents, manganese and silicon, can be used together in dependence upon the properties required for the alloys.

The constituents of the alloys may be in the following range of proportions:—

Nickel	from 25% to 80%
Iron	from 15% to 60%
Silver	from about .05% to 10%
Copper	up to 10%
Manganese	from about .1 to 10%

These alloys have a high permeability which makes them suitable for use on telephone cable transmission, and the more ductile of the alloys are suitable for being used in the form of wires and tapes as well as powder for pupin coils.

These alloys are in two series: (*a*) those low in silver and suitable for the production of wire and strip by hot working processes, (*b*) those with silver contents exceeding 0.5% and particularly suitable for the production of powder by a pulverizing process.

An alloy which has been found suitable for the production of wire and strip is of the following composition:—

	Per cent
Nickel	78
Iron	21.1
Copper	0.05
Manganese	0.75
Silver	0.1

This alloy may also be made into dust by processes other than pulverizing.

Typical alloys for the production of powder by a pulverizing process are the following:—

(*a*)	Per cent
Nickel	77
Iron	20
Copper	0.05
Manganese	0.75
Silver	2.0
Silicon	0.2

(*b*)	
Nickel	37.5
Iron	57
Copper	1
Manganese	0.5
Silver	3
Silicon	1

The permeability of the alloys may be improved by heat treatment consisting of annealing at 900° C. followed by slow cooling.

What I claim as my invention and desire to secure by Letters Patent is:—

1. High permeability magnetic alloys comprising nickel, iron, silver and manganese.

2. High permeability magnetic alloys comprising nickel, iron, silver, manganese and copper.

3. A high permeability magnetic alloy having constituents in the following range of proportions:—

Nickel	from 25% to 80%
Iron	from 15% to 60%
Silver	from about .05% to 10%
Copper	up to 10%
Manganese	from about .1% to 10%

4. A high permeability magnetic alloy, suitable for the production of wire or strip, having the following composition:—

	Per cent
Nickel	78
Iron	21.1
Copper	0.05
Manganese	0.75
Silver	0.1

5. A high permeability magnetic alloy, suitable for the production of powder by a

pulverizing process, having the following composition:—

	Per cent
Nickel	77
Iron	20
Copper	0.05
Manganese	0.75
Silver	2.0
Silicon	0.2

6. A high permeability magnetic alloy, suitable for the production of powder by a pulverizing process, having the following composition:—

	Per cent
Nickel	37.5
Iron	57
Copper	.1
Manganese	0.5
Silver	3
Silicon	1

In testimony whereof I affix my signature.

SYDNEY BECKINSALE.