

UNITED STATES PATENT OFFICE.

PIERCE D. SCHENCK, OF DAYTON, OHIO, ASSIGNOR TO THE DURIRON COMPANY,
A CORPORATION OF NEW YORK.

ACID-RESISTING IRON.

1,398,918.

Specification of Letters Patent.

Patented Nov. 29, 1921.

No Drawing.

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To all whom it may concern:

Be it known that I, PIERCE D. SCHENCK, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have made a new and useful invention in Acid-Resisting Iron, of which the following is a specification.

The invention relates to an iron composition designed to resist the corrosive action of a wide range of gases and liquids and particularly of acids or liquids containing acids. The composition, while resistant to the action of all acids, is particularly so to hydrochloric acid, so that a large field for its use is found in the manufacture of containers for use in connection with such acid. The objects of the invention are: the provision of a composition or alloy of the character described, which is relatively low in cost, which is sufficiently high in tensile strength for use in most relations where an acid resisting metal is required, and which can be fabricated and machined without difficulty.

In its preferred form the composition comprises 8 to 18 per cent. of silicon, 5 to 20 per cent. of copper, 5 to 20 per cent. of nickel and the balance iron, but it will be understood that the invention is not limited to this range of proportions and that alloys with proportions somewhat outside the range stated have some of the advantages stated, although to a less degree.

The iron ordinarily contains one to three per cent. of carbon and three tenths of one per cent. of manganese as well as minute quantities of other elements, but these elements are substantially without influence and for all practical purposes may be disregarded.

Iron when alloyed with silicon alone gives an acid resisting composition and such prop-

erty is greatly increased by the copper and nickel particularly as to hydrochloric acid. Furthermore such metals add to the ductility and strength of the composition making it suitable for use under conditions where a silicon-iron alloy is unsatisfactory.

It will be understood that the proportions specified may be varied somewhat without departing from the invention, and also that other ingredients of more or less neutral character may be added without greatly affecting the product. For instance, manganese may be added without affecting the composition appreciably and the invention comprehends the use, incidental or otherwise, of such more or less neutral ingredients. It follows that the term "iron" as used with respect to the "balance" of the composition is not to be construed as meaning pure 100 per cent iron, but comprehends iron with such expected impurities as do not unfit it for its intended use, and iron containing small percentages of other metals which are more or less neutral in their effect upon the resulting composition. One composition coming under the broad invention which has been found most effective in resisting the action of hydrochloric acid comprises 13 per cent. silicon, 12 per cent. copper, 10 per cent. nickel and the balance iron.

What I claim is:

1. An iron composition comprising 8 to 18 per cent. silicon, 5 to 20 per cent. copper, 5 to 20 per cent. nickel and the balance iron.

2. An iron composition comprising at least 60 per cent. iron and upward of 3 per cent. each of silicon, copper and nickel.

In testimony whereof, I have hereunto subscribed my name this 14th day of April, 1920.

PIERCE D. SCHENCK.