UNITED STATES PATENT OFFICE.

NATHL. C. FOWLER, OF YARMOUTH, MASSACHUSETTS.

COMBINATION OF ALLOYS OF ALUMINIUM WITH VULCANITE.

Specification forming part of Letters Patent No. **46,347**, dated February 14, 1865.

To all whom it may concern:

Be it known that I, NATHANIEL C. FOWLER, of Yarmouth, county of Barnstable, State of Massachusetts, have invented a new and useful combination of metals with vulcanite, and consisting of the combination of an alloy of aluminium with vulcanite, or in combining metals plated or galvanized with aluminium or its alloys with vulcanite; and I do hereby declare the following to be a full, clear, and exact description of the same, which will enable one skilled in the art to which this invention appertains to make use of and apply the said invention.

The object which I have in view is to obtain a metal which may be exposed to the process of vulcanization in connection with the plastic gum to which it has been attached without impairing the intimate connection of the metal and the gum, or the defacement or sulphurization of the metallic surface. It is desirable that the said metal, in addition to the power of withstanding corrosion in the process of vulcanization, shall possess tensile strength, beauty, and comparative lightness, to adapt it to many special purposes where such a quality will be desirable. I propose two modes of securing this result, which both depend upon the presence of aluminium: first, making an alloy of aluminium with another, or with other metals in any such proportions as that the aluminium present in the alloy will enable the latter, when in contact with the plastic gum, to resist the action of sulphurization or oxidization in any greater degree or more perfectly than the metal or metals would be able to without the portion of aluminium; secondly, by giving the surface of any metal or alloy which I desire to use in connection with plastic gum for subsequent vulcanization a coating of aluminium or of its alloys by any of the familiar processes—such as galvanizing or plating—by which the surface of the said metal or alloy is protected from the corrosion incident to said metal or alloy in the process of vulcanization.

I do not include in this specification using pure aluminium in combination or connection with vulcanite, as that is the subject of a separate application; and I do not claim any particular combinations of metals with aluminium, or make any claim herein to the invention of any special alloy, as alloys in which aluminium forms a component part have been recommended for many purposes and used for some that might be specified.

The gist of my invention consists in using, in connection with plastic gum which is to be subsequently submitted to the process of vulcanization, an alloy of which aluminium forms a component part in any proportion, or of using in the said combination or connection with plastic gum of any metal or alloy coated in any manner with aluminium or its alloys.

By long continual study and expensive experiments, continued for years, and at an outlay of many thousands of dollars, I have developed the value of and reduced to practical use the combination the subject of this and kindred applications.

One object of using the alloy in contradistinction to the pure aluminium (which latter, I repeat, I do not claim under this application) is economy of material and color, as by a combination with copper I may obtain a yellow metal, which, under certain supposable circumstances, may be advantageous or preferable; or, in combination with gold where economy is not the object, I may add to the gold certain valuable characteristics which adapt it to special purposes. I propose in this way to electroplate steel for ornaments set in or attached to vulcanite; to give a surface protection to iron, wire, or gauze for strengthening vulcanized rubber for belting or other purposes; to put a coating on the shanks or tangs of knives, tools, and instruments which are inserted into vulcanite handles; to galvanize nails or brads for shoes for attaching vulcanized-rubber soles; to attach the nozzles or pipes to the india-rubber tubing of syringes, pumps, &c., and to make many other articles of use and ornament in the various departments of arts, trades, and manufactures where the union of a metal with vulcanite is desirable, either as a direct attachment the one to the other, by wrapping, inclosing, or inlaying, or by means of pins, rivets, or other mechanical device.

This improvement is also designed, in addition to the preservative effect during the process of vulcanization, to protect the metal which is in connection with the vulcanite from liability to injury from the atmosphere, from gases, from liquids, or from direct chemical action subsequently to the period when the original change in the condition of the plastic rubber was consummated.

I am aware that alloys of metals have been made with aluminium as a basis or as a component part, as in the French patent of Tissier, of Paris, dated 23d May, 1855, where he alloys it with antimony, silver, bismuth, cadmium, copper, tin, gold, lead, and zinc; and I have alloyed it with platinum, nickel, and iron in addition to those mentioned above. The alloying of these metals with aluminium has had the effect of adding to the tensile strength of the metal with which it is united, and of diminishing the tendency to oxidization. At least the general tendency has been in these directions. I, however, make no claim to any of these alloys, separately considered, as most of them have been known for many years; but

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an alloy of aluminium with vulcanite, when the said alloy is used as a means of attachment to or in contact with vulcanite, or as a means of attachment to other material exposed to the vulcanizing process.

2. The combination, with vulcanite, of metals coated or plated with aluminium or its alloys in which the said coating or covering is in contact with the vulcanite or exposed to the process of vulcanization.

NATHL. C. FOWLER.

Witnesses:

R. I. GATLING,

CHARLES D. SMITH.