

UNITED STATES PATENT OFFICE.

ROGER WILLIAM WALLACE, OF LONDON, ENGLAND, ASSIGNOR TO THE
ELECTRO-METALLURGICAL COMPANY, LIMITED, OF SAME PLACE.

METHOD OF PRODUCING ALLOYS OF IRON AND CHROMIUM.

SPECIFICATION forming part of Letters Patent No. 567,757, dated September 15, 1896.

Application filed July 8, 1896. Serial No. 598,478. (No specimens.)

To all whom it may concern:

Be it known that I, ROGER WILLIAM WALLACE, a citizen of the Kingdom of England, and a resident of London, in said Kingdom, have invented certain new and useful Improvements in the Treatment of Irons and Steels with Chromium in Order to Obtain Chrome Alloys, of which invention the following specification is a full, clear, and exact description.

It is known that baths of molten iron or steel are rendered pasty by traces or by a certain quantity of oxid, which it is important to eliminate, so as to increase the fluidity of the mass, in order to obtain castings free from blow-holes. Further, pure chromium, such as is obtained, for example, by means of electrolytic processes, has a very great affinity for oxygen. From this it follows that in the preparation of alloys of iron and steel with pure chromium the affinity of chromium for oxygen can be utilized in order to effect the deoxidation of the mass at the moment of introducing the chromium.

In operating simply as just indicated it would be very difficult to effect exact proportions or dosages, and, moreover, a considerable quantity of chromium would be lost, which it is desirable to avoid when the high price of this metal is considered. To avoid the difficulties above indicated, the operation is carried on as follows:

It is begun by adding to the molten mass of iron or steel a quantity of aluminium sufficient to effect nearly complete deoxidation. It is important in this preliminary treatment not to deoxidize the mass completely, for there would then be free aluminium which would become incorporated in the molten mass, and there would finally be obtained an alloy of aluminium, which should be avoided.

To the molten mass, almost completely deoxidized by the aluminium, is added the quantity of chromium which corresponds with the proportions of the alloy that it is desired to obtain, and also an excess of the same metal, designed to remove the small quantity of oxid which the mass still contains. By this process, without any considerable loss of chromium, a very fluid alloy is consequently obtained, which contains no trace of metallic aluminium.

What has been said above concerning chromium is applicable to similar metals, such as molybdenum or tungsten.

I claim as my invention or discovery—

The hereinbefore-described improvements in the treatment of iron and steel with pure chromium or similar metals, such as molybdenum or tungsten in order to obtain alloys of these metals, said improvements consisting in deoxidizing the molten mass of iron or steel almost completely by the addition to the iron or steel bath of such a quantity of aluminium as may be completely transformed into oxid, the deoxidation of the mass being finished when the chromium or like metal is introduced into said bath by the transformation of a small part of the chromium or like metal into oxid of chromium or like metal, the rest of such metal alloying itself with the iron or steel under treatment.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ROGER WILLIAM WALLACE.

Witnesses:

EDWARD P. MACLEAN,
EDOUARD BARBERRY.