

UNITED STATES PATENT OFFICE.

MAURICE MESLANS, OF PARIS, FRANCE.

MANUFACTURE OF CAST-STEEL.

SPECIFICATION forming part of Letters Patent No. 765,932, dated July 26, 1904.

Application filed July 7, 1902. Serial No. 114,651. (No specimens.)

To all whom it may concern:

Be it known that I, MAURICE MESLANS, a citizen of the Republic of France, and a resident of Paris, France, have invented Improvements in the Manufacture of Cast-Steel, of which the following is a specification.

It is known that the bubbles which occur in greater or less quantity in the pieces or ingots of cast-steel are due principally to the presence of three gases—oxid of carbon, hydrogen, and nitrogen—which are dissolved in the mass and which separate out at the moment of solidification of the metal. This drawback has been removed in a certain degree by the addition to the metallic bath at the moment of casting of a small quantity of aluminium. The action of this metal is to decompose the oxid of carbon, and it thus causes one of the three objectionable gases to disappear; but it has no action on the hydrogen and on the nitrogen, and, further, when the gaseous mixture evolved from steel cast with the addition of aluminium is analyzed only a small percentage of oxid of carbon is found, while from fifty to eighty per cent. of hydrogen and fifteen to forty-five per cent. of nitrogen occur. Consequently in order to remove the hydrogen and nitrogen from the steel it is necessary to employ two metals capable of forming with these gases stable compounds at a high temperature. The metals such as calcium, barium, strontium, and lithium possess this property; but their use in the state of the pure metals is impossible in practice because of their high price and of the difficulty of obtaining them in sufficient quantities. I have discovered, however, that these very metals are capable of uniting with aluminium in proportions which may be varied as desired in such a way that in an aluminium-calcium alloy, for example, the

calcium adds its action to that of the aluminium to eliminate the dissolved gases, forming with the hydrogen and nitrogen fixed or stable hydrides and nitrides. By the use of these compounds I obtain a new, practical, and efficacious process, by which it is possible to produce steel cleared from bubbles.

The addition of a small quantity of alloy to a bath of molten steel takes its effect at the moment of casting in the same manner as has previously been done when using aluminium. The proportion to be used naturally varies with the composition of the alloy, in which the proportion of calcium may range between five and ninety-five per cent. It varies also according as the steel is produced in a reverberatory furnace or by the Bessemer process. Further, in order to effect the thorough contact of the alloy with the bath of metal it is only necessary to follow the course of action employed hitherto with pure aluminium.

I am not aware that any one has heretofore formed such an alloy as I have herein described, and I wish to be understood as reserving all my rights in such alloy or method of making it as inventions for which I have filed a divisional application, Serial No. 206,161, filed May 3, 1904.

I claim as my invention—

The herein-described process for removing oxygen, nitrogen and hydrogen from steel in the process of casting, consisting in incorporating with the molten steel an alloy of aluminium and calcium.

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

MAURICE MESLANS.

Witnesses:

ALPHONSE MIJEAN,
EDWARD P. MACLEAN.