

UNITED STATES PATENT OFFICE.

CHARLES H. WELLMAN, OF UPLAND, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO SAMUEL T. WELLMAN, OF SAME PLACE.

PROCESS OF TREATING STEEL FOR CASTINGS.

SPECIFICATION forming part of Letters Patent No. 609,750, dated August 23, 1898.

Application filed June 13, 1894. Serial No. 514,968. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES H. WELLMAN, a citizen of the United States, and a resident of Upland, Pennsylvania, have invented a Process of Treating Steel for Castings, of which the following is a specification.

The object of my invention is to make a dense steel casting free from blowholes and to dispense with the large risers or sink-heads usually necessary in the manufacture of such casting.

The cost of making steel castings is greatly increased at the present time by the extra metal necessarily used as risers or sink-heads in order to make the castings properly solid, and all steel-casting makers are for this reason compelled to use from twenty-five to fifty per cent. extra weight of steel in making each casting. By my invention I can dispense with the large risers or sink-heads, thus cheapening the cost of manufacture very decidedly and at the same time making a better casting.

In carrying out my invention I add to the steel a small percentage of tin, which increases the solidity of the casting to such an extent as to do away almost entirely with the riser. In some instances I add a quantity of aluminium together with the tin, which not only makes the casting solid, but also improves the quality of the steel, enabling the casting to stand a much better physical test. I find that upon the addition of the tin or tin and aluminium to the molten metal the latter becomes very fluid, the greater part of the gases being liberated, thus making the mass of the metal very dense, so that a casting resulting from the molten steel so treated becomes

very dense and solid. From many experiments and analyses of castings made from steel treated as herein described I find that but very little tin or aluminium remains in the casting, so that the said castings may be considered practically free from the said elements, which are probably oxidized in liberating the gases from the molten metal, as above indicated. The proportions I have used in the manufacture have been from one-tenth to one-half of one per cent. of tin, and when aluminium is introduced about one-twentieth of one per cent.; but I do not limit myself to these proportions, as they may be modified without departing from my invention.

I claim as my invention—

1. The process herein described of making castings of steel containing carbon, said process consisting in combining with the molten steel a small percentage of tin, such as from substantially one-tenth to one-half of one per cent., to increase the solidity of the steel and to reduce the risers or sink-heads, and then casting the steel so treated, substantially as described.

2. The process described of treating steel containing carbon for casting, said process consisting in adding to the molten steel a small percentage of tin and aluminium, substantially as and for the purpose set forth.

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

CHARLES H. WELLMAN.

Witnesses:

WILL. A. BARR,
JOSEPH H. KLEIN.