

UNITED STATES PATENT OFFICE.

SAMUEL P. HUTCHINSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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PROCESS OF MANUFACTURING STEEL CASTINGS.

SPECIFICATION forming part of Letters Patent No. 520,056, dated May 22, 1894.

Application filed April 15, 1893. Serial No. 470,519. (No specimens.)

To all whom it may concern:

Be it known that I, SAMUEL P. HUTCHINSON, a citizen of the United States, residing in Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Process of Manufacturing Steel Castings from Hard Malleable or Refined Iron Castings, of which the following description is a specification.

10 My invention has for its object to produce steel castings which can be readily worked and tempered, from hard malleable or refined iron castings; which object I secure by means of the process as hereinafter described in detail and pointed out in the claims.

15 The metal to be treated is first packed in suitable receptacles constructed to resist a high degree of heat, and is then covered or embedded in a homogeneous mixture composed of the several ingredients and in substantially the relative proportions as follows: fine white silicious sand, one hundred pounds; powdered charcoal, ten pounds; chloride of sodium, seven and one-half pounds; 25 carbonate of potash or wood ashes of hard wood, seven and one-half pounds; carbonate of lime or fluor-spar, one pound; kaolin or alumina or steatite, twenty pounds; black oxide of manganese, three pounds; tungstate of soda, one-third of a pound. The receptacles are then placed in a suitable oven or furnace and subjected to a steady heat of 1,600° to 1,800° until the desired degree of conversion is attained. The duration of time of 35 heating depends upon the size of the metal being treated and the fineness of steel desired. If desired, kaolin or steatite may be used in lieu of the silicious sand and substantially the same result be secured.

40 In some instances, in order to make my process more efficient, I subject the metal or castings to be treated to a bath of diluted sulphuric acid and dry the same preparatory to

heating. This prior bath however, is not an essential element of my invention.

45 Having thus set forth my invention, I do not wish to be understood as confining myself to the exact proportions of the ingredients as set forth, as they may be more or less varied according to the skill of the operator and the demands of the metal being treated may require; but 50

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The herein described method of converting malleable or refined iron castings into steel, which consists of packing the castings or metal in a mixture composed of silicious sand, powdered charcoal, chloride of sodium, wood ashes, carbonate of lime, alumina, black oxide of manganese and tungstate of soda, and then exposing the same to a steadily controlled high heat, substantially as set forth. 55 60

2. The herein described method of converting malleable or refined iron castings into steel, which consists in first subjecting the metal to a sulphuric acid bath, then drying the metal, and exposing it to a steadily controlled high heat in the presence of a mixture composed of sand, charcoal, chloride of sodium, wood ashes, carbonate of lime, alumina, black oxide of manganese and tungstate of soda, substantially as set forth. 65 70

3. The herein described method of converting malleable or refined iron castings into steel, which consists in packing the castings or metal in a mixture composed of sand, charcoal, chloride of sodium, wood ashes, carbonate of lime, steatite, black oxide of manganese and tungstate of soda, and then exposing the same to a steadily controlled high degree of heat, substantially as set forth. 75 80

SAMUEL P. HUTCHINSON.

Witnesses:

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