

# UNITED STATES PATENT OFFICE.

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## PROCESS OF PREPARING SAND MOLDS FOR STEEL CASTINGS.

SPECIFICATION forming part of Letters Patent No. 686,189, dated November 5, 1901.

Application filed July 10, 1901. Serial No. 67,775. (No specimens.)

*To all whom it may concern:*

Be it known that I, HERBERT B. ATHA, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Processes of Preparing Sand Molds for Steel Castings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in the art or process of preparing sand molds, and more particularly "green-sand molds," for manufacturing steel castings, the objects being to secure a smoother and more perfect casting and to obtain other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved process of forming or preparing sand molds for steel castings, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

In carrying out the improved process I first prepare the mold, employing green or damp sand common in manufacturing steel castings, using with the said green sand a suitable pattern by any of the methods common in the art of preparing molds for steel castings. The green sand being suitably packed about the pattern and the pattern having been withdrawn from the sand, as usual, the surfaces of the sand mold are washed or painted with a liquid composition of silica, dolomite, or other substance incapable of fusing at a temperature of 2,000° of heat, and a highly volatile or inflammable liquid, such as alcohol, gasolene, benzene, naphtha, or other liquid having higher volatility than water. In practice I prefer to first dissolve in twelve parts of naphtha, five parts, by bulk, of rosin, and to one part of this solution I add two parts of clear naphtha and three parts of silica. The addition of the rosin serves to hold the silica in suspension in the liquid, so that the painting may be more uniform and effective. The wash having been applied and the benzene, naphtha, or other inflammable liquid having become absorbed by the sand and the fine silica of the composition having entered be-

tween the interstices of the molded sand, filling the same to a greater or less extent, fire is applied to the washed sand mold, so that the said inflammable fluid is quickly consumed, leaving a thin layer of silica on the surface of the mold, the said silica forming, with the sand, a somewhat hard crust, which gives smoothness and comparative strength to the surface, so that when the metal is poured into the mold a casting will result of greater smoothness and perfection of surface than heretofore, or the mold may be allowed to stand unburned, when the volatile liquid will soon dry out, leaving a crust of silica with an admixture of rosin. The ignition of the volatile liquid heats the sand, so that the water or dampness therein at the surface is driven out, and when the molten metal is subsequently poured into the mold there is little opportunity or possibility for the production of steam or other gas and the production of blow-holes in the casting.

Having thus described the invention, what I claim as new is—

1. The improved process of preparing sand molds for casting therein herein described, which consists in first pressing the sand about a pattern, then withdrawing the pattern and applying to the surface of the mold, a wash or paint of a fine silica and a highly volatile or inflammable liquid, and finally igniting the liquid, substantially as set forth.

2. The art of making sand molds for steel castings, consisting in applying to the surface of the molded sand a mixture of fine silica and an inflammable liquid and igniting such liquid, substantially as set forth.

3. The art of preparing green-sand molds for steel casting, consisting in applying to the surface of the molded sand a mixture of fine silica rosin and an inflammable liquid and igniting such liquid and heating the said surface, and thus drying the dampness from the green sand at said surface, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of July, 1901.

HERBERT B. ATHA.

Witnesses:

CHARLES H. PELL,  
C. B. PITNEY.