(Model.)

H. B. STANERT.

HOLLOW CHILL.

No. 345,455. Patented July 13, 1886.

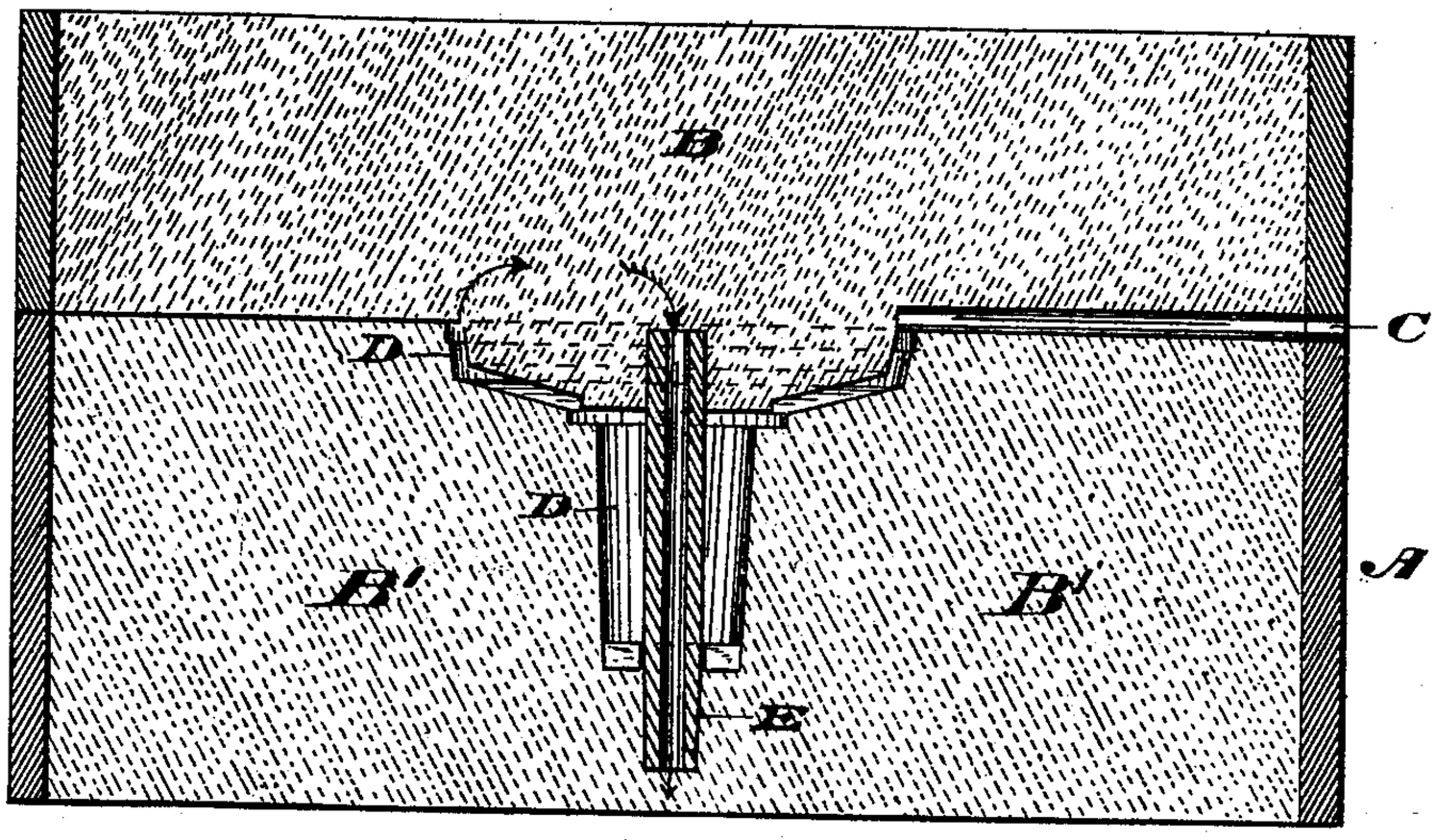
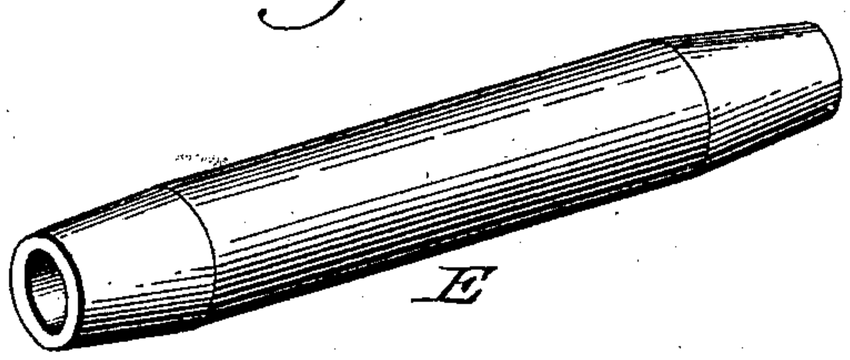


Fig. 2.



WITNESSES:

Frdk. F. Campbell.

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INVENTOR:

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UNITED STATES PATENT OFFICE.

HENRY BENNETT STANERT, OF NEWARK, NEW JERSEY.

HOLLOW CHILL.

SPECIFICATION forming part of Letters Patent No. 345,455, dated July 13, 1886.

Application filed November 2, 1885. Serial No. 181,588. (Model.)

To all whom it may concern:

Be it known that I, HENRY BENNETT STANERT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hollow Chills; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to prevent the formation of blow-holes in castings, particularly those in which a chill is used, caused by the retention of air in the matrix, which, by the methods and devices heretofore employed, is unable to escape from the matrix with sufficient rapidity as the metal is poured into the mold.

The invention consists in the combination, with a mold, of a hollow chill, the perforation in which extends entirely therethrough, said chill being arranged within the matrix, and inclosed on all sides by the sand, substantially as illustrated in the drawings, and described and claimed hereinafter.

In the said drawings, Figure 1 is a longitudinal section of a flask, showing one relation of the hollow chill to a matrix adapted to form one kind of a casting; and Fig. 2 is a view of the hollow chill detached from the mold.

A in the above-described views indicates the frame of the mold; B B′, the sand in the cope and drag portions of the mold, respectively; C, the pouring duct or gate, and D the matrix or imprint of the pattern.

Within the imprint D is arranged a hollow chill, E, the perforation in which extends entirely therethrough, which is centered in the core-prints; and as the metal enters the matrix it flows around and in direct contact with the metal tube or chill, whereby the interior of the casting is hardened, acting in this respect like an ordinary solid chill; but, in addition to this feature, which is the common function of all chills, the cavity in the hollow chill performs another function, which is attended with excellent results in practice. Under ordinary circumstances the only escape for the air is through the sand; and in making large castings, in which but a thin layer of sand intervenes between the matrix and the outside or surrounding air, the gases may escape very readily; but when small castings are made, and particularly those placed horizontally in the mold between the cope and drag—as door-butts—the thick body of sand on all sides of the matrix resists the quick passage of the air to the certain damage of the castings. The presence of the cavity in the chill tends to obviate this difficulty, since the chamber or cavity provides a reservoir into which the gases may escape, flowing in the direction of the least resistance, and is compressed therein until it generates enough power to force its way through the thick layers of sand. By thus affording a receptacle or chamber for the immediate reception of the air, without compelling it to force its way directly from the matrix through the sand into the outside air, the gases are not retained in the matrix or retarded in their exit therefrom, causing thereby the formation of blow-holes.

As will be understood, the mold shown for illustration in the drawings is intended to be "set up" or inclined at an angle while the metal is poured; and to avoid burning the top and bottom boards of the mold by the crucible, said boards are moved slightly before the crucible is brought against the top of the flask, to support the said crucible and enable the pourer to direct the metal into the gate, as will be perfectly understood by any one familiar with this kind of casting. As the metal enters the matrix and flows to the bottom thereof, it forces a portion of the air into the sand and through the crevice between the lower end of the chill and the surrounding sand and into the interior of the chill, and the metal in rising in the matrix drives the air upward before it out into the sand and into the upper end of the chill. By thus inclosing the chill entirely within the mold, and surrounding it by the sand, the air and gases have access to both ends of the cavity in the chill, and the free escape of the air from both ends of the matrix into the chill is permitted. The capacity of the chill varies with the size and nature of the casting.

I am aware that a tube extending through

a sand core has been shown in relation to certain kinds of castings, in the patent of S. J. Adams, issued February 4, 1879; but the tube therein used is designed solely to permit the insertion of a guiding-rod in centering the core, and is not intended and cannot fill the purpose for which my hollow chill is adapted. Moreover, the said tube must extend through the drag-board in order to permit the withdrawal of the guiding-rod, and consequently but one end of the tube is in and surrounded by the sand, the other end extending out into the open air, and is therefore liable to be stopped up by particles of sand falling therein into.

Another disadvantage of having the guiding-rod tube projecting through the bottom or drag board is, that in sliding the boards, when the flask is inclined, to prevent burning said boards by the crucible, the matrix would be destroyed by the moving of the tube. While the tube might serve its purpose to receive a guiding-rod in molds in which a sprue is used, and the mold is allowed to remain upright while the metal is poured, still, for a closed mold, and castings the interior of which is to be hardened or chilled, and for a large number of small hollow castings, the hollow chill possesses manifest advantages. In the guiding-rod tube but one end is inclosed by the sand, while in my arrangement, as hereinbefore mentioned, the sand surrounds both ends of the chill, and provides a double means of escape for the air.

By experiments I have found that the hollow chill is especially advantageous in the end of the mold, or the lower part thereof when inclined, where the sand is rammed very hard to withstand the flow and weight of the metal as it is poured into the mold. This ramming destroys the porosity of the sand, and in consequence retards the escape of the air therethrough; but the presence of the cavity in the chill provides a method of escape which is shown to be beneficial, from the fact that, whereas a large percentage of loss resulted from the use of the solid chill, by the use of the hollow chill the percentage of loss is hardly one per cent.

Having described my invention, I wish to claim the following:

The combination, with a close mold or sand-flask, of a hollow chill, the chamber or cavity in which extends entirely therethrough, said chill being arranged within the matrix in said mold, inclosed on all sides by the sand therein, whereby the air in the matrix has free access to bothends of the chill, and cut off from communication with the outside air, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of October, 1885.

HENRY BENNETT STANERT.

Witnesses:
CHARLES H. PELL,
FREDK. F. CAMPBELL.