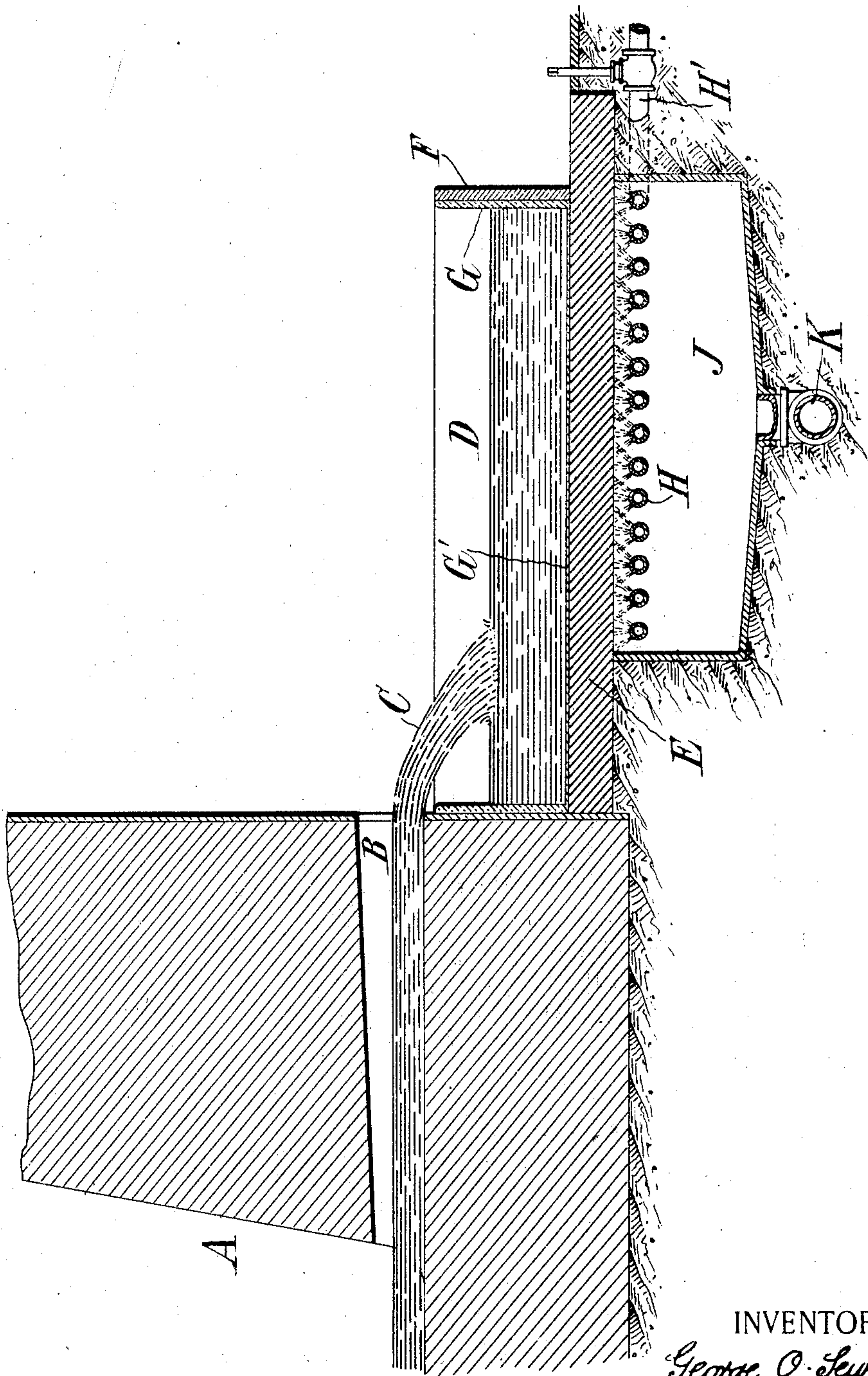


G. O. SEWARD.  
WATER COOLED MOLD.  
APPLICATION FILED JULY 13, 1908.

905,373.

Patented Dec. 1, 1908.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE O. SEWARD, OF HOLCOMBS ROCK, VIRGINIA, ASSIGNOR TO VIRGINIA LABORATORY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## WATER-COOLED MOLD.

No. 905,373.

Specification of Letters Patent.

Patented Dec. 1, 1906.

Application filed July 13, 1906. Serial No. 326,011.

*To all whom it may concern:*

Be it known that I, GEORGE O. SEWARD, a citizen of the United States, residing at Holcombs Rock, in the county of Bedford and State of Virginia, have invented certain new and useful Improvements in Water-Cooled Molds, of which the following is a specification.

This invention relates to water-cooled or chilled molds into which to tap molten products of a high temperature or which it would be undesirable to discharge into molds of clay, sand, or the like. It has been proposed to tap certain products of the electric furnace into a mold made of cast iron or steel, and cooled by being submerged in a water bath or otherwise provided with a water-jacket. This method is dangerous because of the liability of the hot metal to melt through the iron or steel mold or otherwise to get into contact with the body of water, which would result in a disastrous explosion.

My invention is designed to secure an efficient cooling action while avoiding the maintenance of any bath or body of water where by any possibility it could come into contact with the molten metal.

According to my invention I provide for cooling the mold by numerous small jets of water directed against its outer or under surface, the water being immediately conducted away, so that, if the bottom of the mold should be melted through, the molten metal could by no possibility come in contact with more than a very limited volume of water. I construct the bottom of the mold of a thick steel plate, the sides of the mold being of thinner metal supporting any suitable refractory lining. The water spray is secured by arranging a coil or rack of pipe directly beneath the thick plate having perforations to direct the jets upwardly thereagainst, the waste water being caught in a box beneath having a large outlet so as to immediately conduct away the water without permitting any considerable quantity of it to collect.

The accompanying drawing is a vertical section through the outlet of a furnace and through the mold and cooling means.

A is the furnace, whose outlet or tap B is shown open with the molten metal C pouring into the mold D. The latter is shallow or of tray form, so that the ingot or pig is made

as an extended plate which may rapidly cool and may be easily broken up for remelting. The mold is made of a thick plate E of rolled steel which forms its bottom, and of side plates F which may be of thinner metal to support a refractory lining G, which may be of fire-clay. This lining should be about three-fourths of an inch thick on its sides, with a mere wash G' on the bottom.

For cooling the mold, water pipes H H are provided arranged beneath the plate E and having perforations in their upper sides to direct jets of water up against the under side of this plate. Water under suitable pressure is supplied from a pipe H' controlled, if need be, by any suitable valve. For receiving the spent water a box J is provided, inclosing the perforated pipes and sloping to an outlet K formed by a pipe of such large area and so sloped as to have abundant capacity for carrying off the water, so as to avoid its collecting in the box J.

Although the proportions may be greatly varied, I will state that I have used for tapping to produce ingots of about eight inches thickness a steel plate E four inches thick, the sides F of the mold being of iron one inch thick and twelve inches wide, cooled by a three-fourths-inch water-pipe H in fourteen parallel branches perforated with one-eighth-inch holes two inches apart.

As illustrating the safety of the construction thus described, I mention an instance where the plate E cracked across and the entire tap of metal ran down into the box while the sprays were in operation, without causing any explosion.

In using the apparatus it is preferable to turn off the water after the tap has been removed from the plate E (the side walls F being separable therefrom), which leaves the bottom plate sufficiently hot to readily dry the new lining for the next tap.

The particular construction and arrangement of the parts may of course be considerably varied without departing from the essential features of my invention.

I claim as my invention:—

1. A tapping mold for receiving the super-molten metal from an electric furnace, comprising a substantially flat bottom plate, and having a cooling means adapted to direct jets of water against the under side of said plate, and means for rapidly carrying away the



spent water, so that no material body of water can accumulate beneath the plate at any time during the tapping.

2. A tapping mold for receiving the super-  
5 molten metal from an electric furnace, comprising a substantially flat bottom plate, and having a cooling means adapted to direct jets of water against the under side of said plate, a collecting box beneath said plate, and an  
10 outlet from said box adapted to rapidly carry away the spent water therefrom, so that no material body of water can accumulate therein.

3. A tapping mold for receiving the super-

molten metal from an electric furnace, comprising a thick bottom plate, combined with  
15 cooling means adapted to direct jets of water upwardly against the under side of said plate, and means for rapidly carrying away the spent water, so that no material body of  
20 water can accumulate therein.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE O. SEWARD.

Witnesses:

F. VON BIDDER,  
J. H. WEBB.