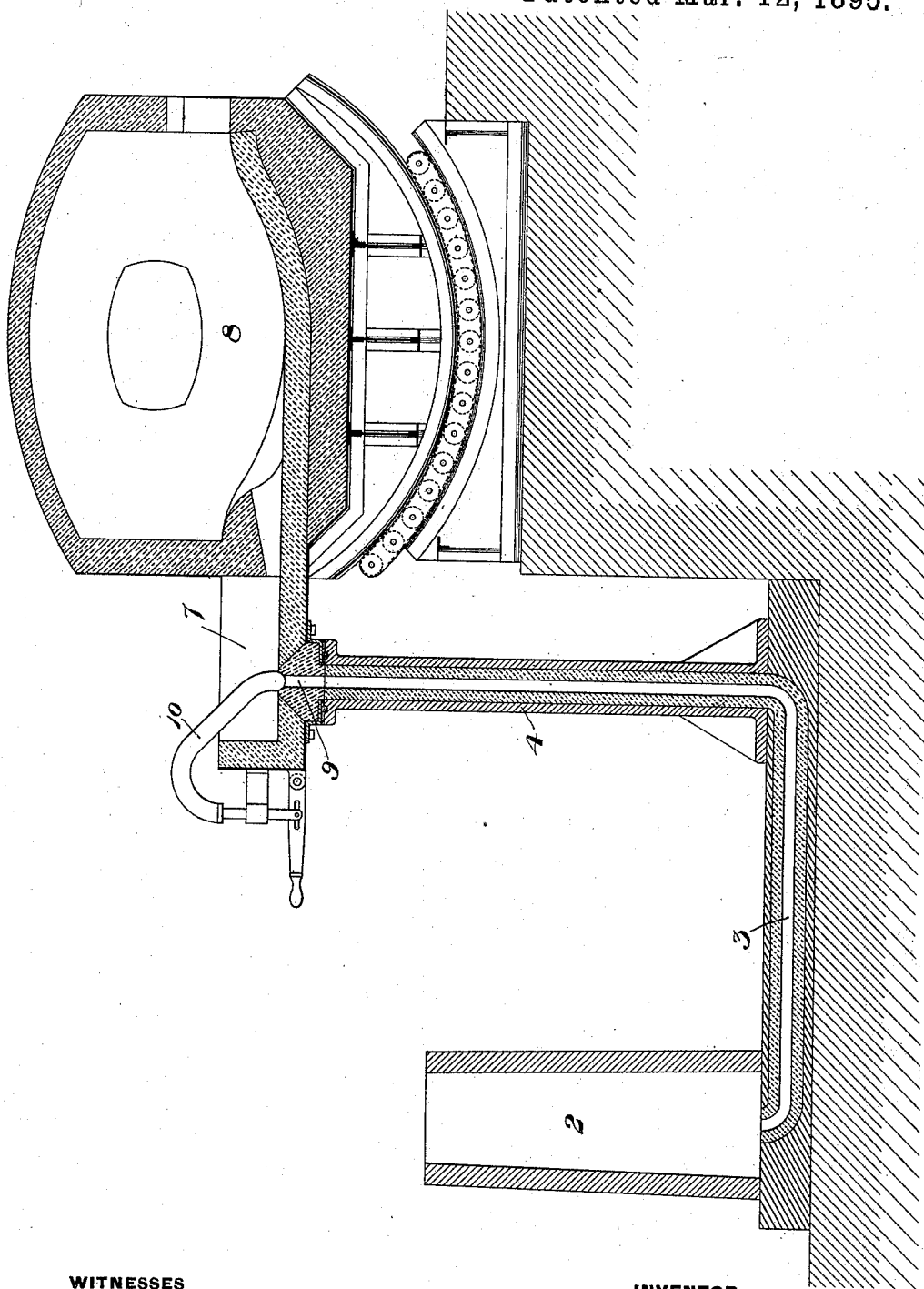


(No Model.)

J. A. POTTER.
CASTING STEEL.

No. 535,598.

Patented Mar. 12, 1895.



WITNESSES

Marvin H. Swartz
A. L. Gill

INVENTOR

John A. Potter
by his Attorneys
W. Baxendell & Sons

UNITED STATES PATENT OFFICE.

JOHN A. POTTER, OF CLEVELAND, OHIO.

CASTING STEEL.

SPECIFICATION forming part of Letters Patent No. 535,598, dated March 12, 1895.

Application filed May 2, 1894. Serial No. 509,771. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. POTTER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Casting Steel, of which the following is a full, clear, and exact description.

The object of my invention is to provide means for casting ingots or other articles of metal, particularly ingots of steel, in such manner that air is prevented from being sucked into the mold by the ingoing stream of metal, and the metal is prevented from coming into contact with the air and being agitated therewith during its passage into the mold.

Where molten steel is teemed into an ingot mold in the ordinary manner, either at the top or through a bottom-runner, air is drawn in with the metal by induction and is mixed with it, and the oxygen attacking the carbon and other constituents of the metal forms gases which to some extent are caught by the metal and give rise to the formation of blow-holes. By local reaction, such gas-bubbles cause the formation of segregated pockets of carbon in surrounding parts of the steel, and thus render the ingot unequal in composition and impair its commercial value. By my apparatus and method I provide for the entire prevention of the metal from mixing with the air while it is being poured and introduced into the mold, and I thus obviate the difficulties above mentioned. I effect this by introducing the metal into the mold through a bottom-runner having a vertical stand-pipe connected to a projecting fore-hearth of the furnace from which the steel is poured, the intermediate joint preferably being luted with clay to prevent the ingress of air.

In the figure, which shows my improved apparatus in vertical section, 2 represents an ingot-mold set over a bottom runner 3, connected to the vertical stand-pipe 4, a fore-hearth or reservoir situate above the stand-pipe, the joint being luted in any suitable way, and which communicates with the tap-hole of an open-hearth steel-melting furnace 8, preferably supported on bearings on which it can be tipped so as to discharge the metal.

In using the apparatus, the forehearth 7

being in the position shown in the drawing, the metal is caused to flow thereinto from the furnace, and when the stopper is raised it flows through the stand-pipe into the mold, all without being subjected at any time to contact with the air on its passage down and into the mold.

The forehearth or reservoir above described is built on or fixed to the front of the furnace opposite the tap-hole, and has a bottom discharge opening 9 and stopper 10. When the steel is properly melted in the furnace, the tap-hole is opened and it is caused to flow into the forehearth and is then discharged through the opening at the bottom as above described. This construction is of advantage, for, as the steel is not removed from the heat of the furnace so long as it is when the practice of pouring from a ladle is employed, it need not be heated to such extent, and the cost of constructing and maintaining the ladle is saved. For these reasons, the use of such forehearth is desirable, even when the steel is teemed into the tops of molds placed directly below the discharge opening, and I intend to claim the same broadly.

The advantages of my invention will be appreciated by those skilled in the art. The apparatus which I use is simple and easy to operate, and the invention is practiced with good results.

Modifications in the apparatus which I have shown may be made without variance from my invention as defined in the claims, since

What I claim, and desire to secure by Letters Patent, is—

1. In casting apparatus, a mold, a stand-pipe communicating therewith by a bottom runner, and a steel-melting furnace having secured to one of its sides a forehearth communicating with the furnace-chamber, the sides of the forehearth extending above the bottom of the furnace chamber to provide a reservoir for the molten metal and said forehearth having a stoppered opening provided with a close connection to the top of said standpipe, substantially as described.

2. In casting apparatus a mold, a stand-pipe communicating therewith by a bottom runner, and a tilting melting furnace having secured to its side a forehearth communicat-

ing with the furnace-chamber, the sides of the
forehearth extending above the bottom of the
furnace chamber to provide a reservoir for
the molten metal, and said forehearth having
5 a stoppered opening provided with a close
connection to the top of said standpipe; sub-
stantially as described.

In testimony whereof I have hereunto set
my hand.

JOHN A. POTTER.

Witnesses:

THOMAS W. BAKEWELL,
H. M. CORWIN.