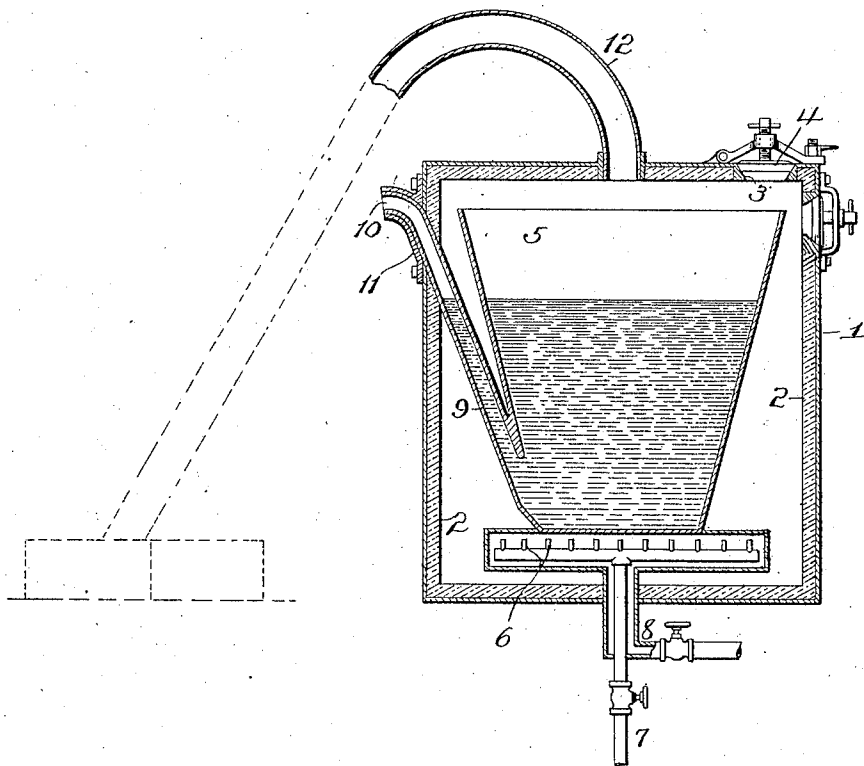


W. S. BRIAN.
REDUCING METAL TO A MOLTEN STATE SUITABLE FOR CASTING;
APPLICATION FILED FEB. 10, 1908.

964,896.

Patented July 19, 1910



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WILLIAM SANDS BRIAN, OF MEMPHIS, TENNESSEE.

REDUCING METAL TO A MOLTEN STATE SUITABLE FOR CASTING.

964,896.

Specification of Letters Patent.

Patented July 19, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM S. BRIAN, of Memphis, in the county of Shelby and State of Tennessee, have invented certain new and
5 useful Improvements in Reducing Metal to a Molten State Suitable for Casting; 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
10 to which it appertains to make and use the same.

My invention relates to means for reducing metal to a molten state suitable for casting,—the object of the invention being to
15 provide apparatus by means of which metal requiring great heat for its reduction to a molten state, can be quickly brought to a condition suitable for making castings which shall be smooth and ready to assemble when
20 cooled, without the necessity of extensive finishing operations.

A further object is to so construct the apparatus that ready means will be afforded for delivering molten metal from the same
25 to the molds in which it is cast.

With these objects in view the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the
30 claims.

The accompanying drawing is a sectional view of an apparatus embodying my invention.

1 represents a furnace jacket provided
35 with a lining 2 of non-conducting material and having in its top, an opening 3 which is normally tightly closed when the apparatus is in operation, by means of a gate 4. This gateway affords an entrance for metal
40 to be melted in a crucible 5 located within the furnace and supplied with heat by means of burners 6. Liquid or gaseous fuel may be employed and conducted to the burners from any suitable source of supply through
45 a pipe 7 passing through the bottom of the furnace and suitably packed to prevent the escape of air from the furnace chamber. A valved air pipe 8 may be employed for supplying sufficient oxygen to support combustion at the burners. Instead of using liquid
50 or gaseous fuel, the crucible may be heated by suitable electrical heating means.

The crucible 5 is provided with an outlet spout 9 which communicates with the crucible at the bottom of the latter and extends upwardly in an inclined or diagonal

direction and passes through the wall of the furnace, terminating at its upper end (exteriorly of the furnace wall) in a nozzle 10 which is intended to communicate with a
60 mold to discharge molten metal thereinto for casting the same. A strong jacket 11 is secured to the furnace wall and embraces the nozzle end of the spout 9. The spout 9 should be of sufficient height to cause the
65 level of molten metal therein to be inside the furnace wall when the pressure which is employed to force the molten metal through said spout, shall have been removed.

An air pipe 12 communicates with the top
70 of the furnace chamber over the open top of the crucible and through this pipe, air is forced under considerable pressure by means of any suitable pump or air compressor.

Normally the air pressure within the furnace chamber will be uniform throughout
75 the same. When the metal contained in the crucible shall have been reduced to a molten condition, the air pressure within the furnace chamber will be increased by the air
80 forced into the same through the pipe 12 and the molten metal, seeking the path of least resistance will flow through the spout 9, being forced to do so by the pressure upon the body of the metal in the crucible. The
85 molten metal thus caused to flow through the spout 9 will be emitted at the nozzle 10 to the mold,—the latter being supported by any suitable means in position at said nozzle. As soon as the air pressure from the pipe 12
90 is closed and the pressure within the furnace chamber reduced to or approximately to the normal, any molten metal which may at that time be in the upper portion of the nozzle, will flow back and become disposed within
95 that portion of the spout located in the furnace chamber, thus preventing the cooling of metal within the nozzle portion of the spout and the consequent clogging of the same.

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is—

1. In an apparatus of the character described, the combination of a furnace chamber and a crucible located therein, said crucible having its upper end open within said
105 furnace chamber, means for conducting molten metal from said crucible to the exterior of the furnace chamber and means for admitting fluid under pressure into said furnace chamber to force the molten metal to

flow from said crucible through said conducting means.

2. In an apparatus of the character described, the combination of a furnace chamber, a crucible therein, said crucible having its top open within the furnace chamber, a normally closed gateway in the top of the furnace chamber over the crucible for admitting metal to the crucible, a spout communicating with the lower portion of the crucible and projecting through the wall of the furnace chamber, and a pipe communi-

cating with the furnace chamber over the open top of the crucible for admitting fluid under pressure into said furnace chamber to force the molten metal to flow from the crucible through said spout. 15

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILLIAM SANDS BRIAN.

Witnesses:

T. J. TINLEY,
C. W. STEWART.