

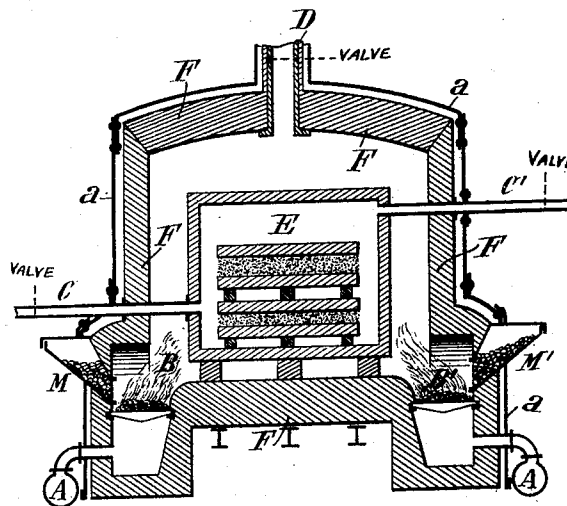
F. GIOLITTI.

FURNACE FOR THE CEMENTATION OF ARTICLES OF IRON, STEEL, AND ALLOYS OF STEEL.

APPLICATION FILED AUG. 31, 1908.

933,642.

Patented Sept. 7, 1909.



ATTEST.

Bentley, Stahl.
Edw. A. Tolson.

INVENTOR.

FEDERICO GIOLITTI.

Wm. Spear, Wm. A. T. Spear, Wm. A. T. Spear
ATTY'S.

UNITED STATES PATENT OFFICE.

FEDERICO GIOLITTI, OF ROME, ITALY, ASSIGNOR TO SOCIETA ANONIMA ITALIANA GIO.
ANSALDO ARMSTRONG & C., OF GENOA, ITALY.

FURNACE FOR THE CEMENTATION OF ARTICLES OF IRON, STEEL, AND ALLOYS OF
STEEL.

933,642.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed August 31, 1908. Serial No. 451,052.

To all whom it may concern:

Be it known that I, FEDERICO GIOLITTI, a subject of the King of Italy, and residing at 35 Via Palestro, Rome, Italy, professor of chemistry, have invented certain new and useful Improvements in Furnaces for the Cementation of Articles of Iron, Steel, and Alloys of Steel, of which the following is a specification.

This invention has for object to provide an improved furnace for the "cementation" of articles of iron, steel and alloys of steel, in which the carburizing agent is a carburizing gas such as carbids of hydrogen, carbon monoxid etc., or mixtures of such gases, and is employed under a pressure higher than ordinary atmospheric pressure.

In cases where the "cementation" is effected by employing a gas under a low pressure, it is not necessary to have recourse to special expedients; it is sufficient to introduce by means of a compressor, the gas or gaseous mixture at the desired pressure into an ordinary cementation box of iron or refractory material having the greatest obtainable degree of imperviousness, which is hermetically closed with the exception of orifices for two pipes namely a pipe for entry supply, and a pipe for the exit of the gas employed, said box containing the metal articles to be "cemented" which may react with the carburizing gas. In such a case the box may be heated to the desired temperature in an ordinary cementation furnace. Now in cases where the cementation is to be effected by means of a gas under a higher pressure, it is very difficult to provide a cementation box capable of withstanding high pressures at the high temperatures required for cementation. In such a case it becomes necessary to have recourse to an expedient for protecting the cementation box from the action which the highly compressed gas exerts in its interior. Now according to the present invention a gas under pressure is caused to act upon the exterior of the cementation box at a pressure slightly lower than that of the carburizing gas, so as almost to counterbalance the pressure of the carburizing gas acting in the interior of the box.

The accompanying drawing illustrates by way of example one construction of a furnace embodying the improvements of this

invention. The furnace is shown in vertical section in the figure. F is the furnace body preferably made of refractory material.

B, B' are the fireplaces of which there may be any number according to the size of the furnace. They are fed with fuel by a double-closure arrangement M, M'. The fuel is burned by means of air, which may contain an excess of oxygen if desired, delivered under pressure from the pipes, A, A'.

C and C' are pipes for the entry and exit of the carburizing gas into and from the cementation box, E, through which the gas is caused to pass.

By means of ordinary compressors provided with compensating appliances, and exhaust valves capable of regulation, the pressure in the pipes, A, A', and C, C', is raised gradually and in equal proportions so that the cementation box, E, is subjected always to an internal pressure which is equal to or slightly higher than the pressure exerted on the outside of the box by the combustion gases.

D is a pipe through which the products of combustion pass out; it is furnished with valves for varying and regulating the pressure. The pipes for the exhaust of the carburizing gases are also fitted with similar valves.

The furnace body F is preferably inclosed in a jacket or casing *a* of sheet metal of suitable thickness adapted to be cooled by means of air or water and separated from the furnace body by a space such as will allow of the expansion of said body.

The heating may be effected by means of gas, and the furnace may be provided with apparatus for recovering or regenerating the heat, etc.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

In a furnace for the cementation of articles of iron, steel and alloys of steel, the combination of a furnace body, means for heating the interior of said furnace body, a cementation box for receiving the article to be cemented, said box being adapted to be closed air-tight with the exception of a gas inlet and a gas outlet, a pipe for supplying carburizing gas under pressure through said gas inlet into the interior of the said box, a pipe for conducting away said gas after use

through said gas outlet from the interior of
said box, a pipe for delivering air for com-
bustion under pressure into the interior of
the furnace body a pipe for the exit of the
5 products of combustion from the interior of
said furnace body, and means for controlling
the pressures of the gases passing through
the pipes to the inside and outside of said
box whereby the pressure exerted by the car-
10 bureting gas inside the cementation box is

balanced more or less by the pressure ex-
erted by the air for combustion on the out-
side of the box, as set forth.

In testimony whereof, I affix my signature
in presence of two witnesses.

FEDERICO GIOLITTI.

Witnesses:

G. B. ZRAMDIKLO,
G. BIGZARRI.