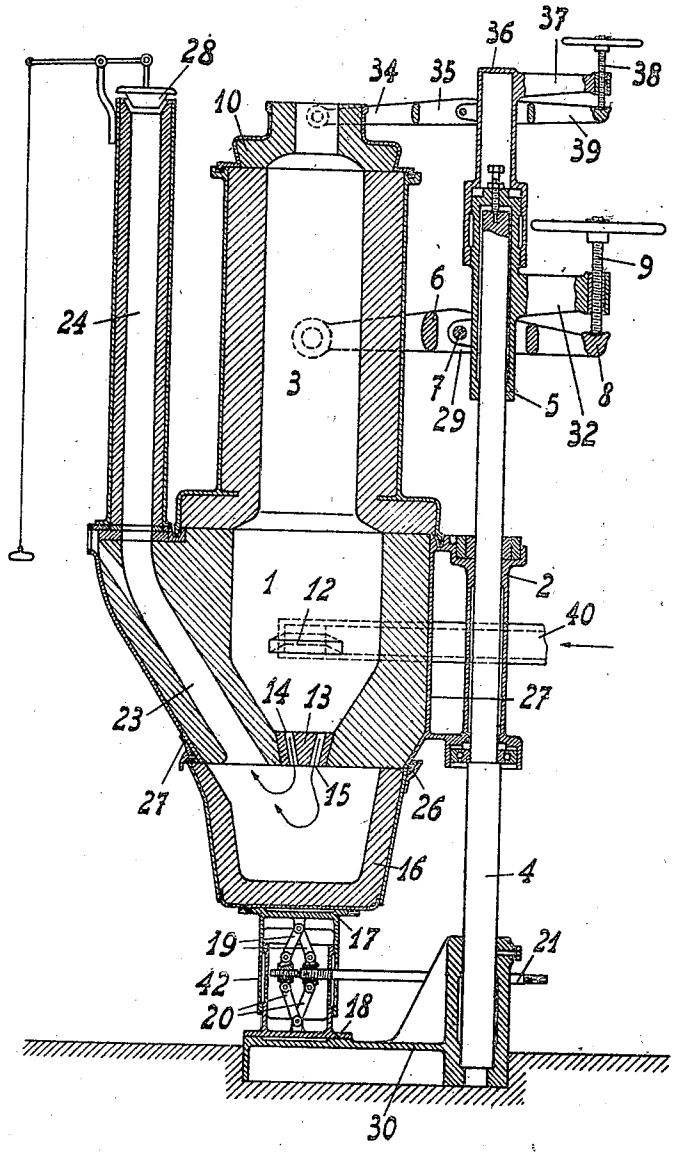
H. KOCH.

CUPOLA FURNACE.

APPLICATION FILED APR. 21, 1920.

1,435,610.

Patented Nov. 14, 1922.



Inventor-
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By- B. Singer, Atty.

Patented Nov. 14, 1922. 1,435,610

UNITED STATES PATENT OFFICE.

HANS KOCH, OF DIETIKON, SWITZERLAND.

CUPOLA FURNACE.

Application filed April 21, 1920. Serial No. 375,559.

To all whom it may concern:

Be it known that I, HANS KOCH, engineer, a citizen of the Swiss Confederation, residing at Dietikon, Canton Zurich, Switzerland, have invented new and useful Improvements in Cupola Furnaces, of which the following is a description.

The present invention relates to a new and improved cupola-furnace and more particularly to furnaces to melt medium or small charges of iron at a time.

One object of the invention is to improve on this type of furnace and to provide means for collecting the liquid metal and for removing it out of the furnace and for utilizing all the heat of the fuel in the best possible manner so that the furnace can be economically made easily managed, and operated so as to produce a more satisfactory and economical result than furnaces heretofore used for the purpose.

With these ends in view my invention consists of a cupola-furnace the construction and operation of which will be hereinafter described and particularly set forth in the appended claims.

Reference is to be had to the accompanying drawings forming part of the specification, in which the new cupola furnace is shown in sectional elevation in a diagrammatic manner.

In the drawing 1 denotes the hearth comprising an iron casing lined with fire bricks. The hearth 1 is rotatably mounted on a vertical pillar 4 by means of a sleeve 2 of the metal shell of the hearth 1. The pillar 4 is firmly attached to a foundation plate. On the top of the hearth 1 rests an upper member 3 comprising a mantle of metal lined with fire brick. The member 3 is journalled in the bifurcated arm 6 of a double armed lever 29 which is rotatably mounted on a shaft 7 fixed in a sleeve 5. The sleeve 5 is rotatably mounted on the pillar 4 and is provided with an arm 32. In said arm 32 a screw threaded spindle 9 is arranged one end of which is provided with a hand wheel and the other end presses on the arm 8 of the lever 29. By means of said spindle 9 the member 3 may be lifted from the hearth 1. On the member 3 rests a dome 10 above which there is a stack not shown in the drawing. The dome 10 is journalled in arms 34 of a double armed lever 35 which lever 35 is pivotally mounted on a sleeve 36 rotatably mounted on the sleeve 5. The sleeve 36 carries on an arm 37 a screw-threaded spindle 38 which acts on the arm 39 and by means of which the dome 10 may be raised from the top face of the member 3. The hearth 1 is provided with two openings 12 arranged diametrically opposite each other. To each opening leads a blast pipe 40 in the well known manner, blast being supplied by any of the well known means such as fans, etc. (not shown in the drawing.) The interior of the hearth 1 is of inverted frusto-conical form and at the bottom there is removably arranged a downwardly tapering member 13 having channels 14, 15 through which molten iron passes into a container 16. The container 16 comprises an iron plate casing lined with fire bricks, and rests on a plate form 17. The plate form 17 is provided with a cylindrical extension 42 which is slidably mounted on a hollow post 18 fixed to the foundation of the furnace. Between the platform 17 and the bottom of the post 18 there is a double toggle joint 19, 20 which is actuated by a screw-threaded spindle 21. By means of the construction described the container 16 may be raised and lowered and may be pressed against the lower face of the hearth 1. In the lining of the hearth 1 a flue 23 is provided which communicates with the container 16 and by means of the holes 14, 15 with the interior of the hearth 1. At the upper end the flue 23 communicates with a stack 24, on the top of which a damper 28 is arranged by means of which the draft may be regulated. To prevent egress of gases through the joint between the container 16 and the hearth 1 I provide the top of the container 16 with an upwardly projecting rim 26 overlapping the joint which may be filled with clay or the like.

The cupola furnace works as follows:

The molten metal flows through the holes 14, 15 into the container 16 and through the same openings escape gases from the interior of the hearth into the container and into the flue 23. Another part of the gases escapes through the member 3 into the stack in the well known manner. The gases passing through the hearth 1 heat the same and the molten iron in the same, the iron is kept at a high temperature. The heating of the container 16 may be regulated by adjusting the damper 28. To empty the container 16 the same is lowered by means of the device 17, 18, 19, 20, 21 and is swung sidewards on the pillar 4 for about 90°. The container

may now be tilted or dipped or may be emptied in any other manner and by any suitable means, the container may be used as a ladle. As the different parts of the furnace are movable, each one is easily accessible and repairs, etc., may be done quickly.

The means for raising and lowering the container 16 may be done away with and may be replaced by another one and the container may be placed on a carriage running on rails and so on.

It will of course be understod that in practice any suitable materials and proportions may be used for the various parts of the furnace and that modifications of the furnace shown may be made without departing from the spirit of the invention.

What is claimed is:

1. A cupola furnace comprising an upper member mounted for vertical movement, a hearth member below the upper member and mounted for lateral movement, and a container to receive molten metal from the hearth member and mounted for vertical movement.

2. A cupola furnace comprising a pillar, a hearth member pivotally mounted on the pillar for lateral movement, an upper member, means to raise and lower said upper member, said means being mounted on said pillar, a container below the hearth member, and means to raise and lower said container.

3. A cupola furnace comprising a pillar, a hearth member pivotally mounted on the pillar for lateral movement, an upper member, means to raise and lower said upper member, said means being mounted on said pillar, a dome on the upper member, means to raise and lower said dome, said means being also mounted on said pillar, a container below the hearth member, and means to raise and lower said container.

In testimony whereof I affix my signature.

HANS KOCH.