

E. WIDEKIND.
 APPARATUS FOR DRYING AND HEATING LADLES, &c.
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1,057,905.

Patented Apr. 1, 1913.

Fig. 1.

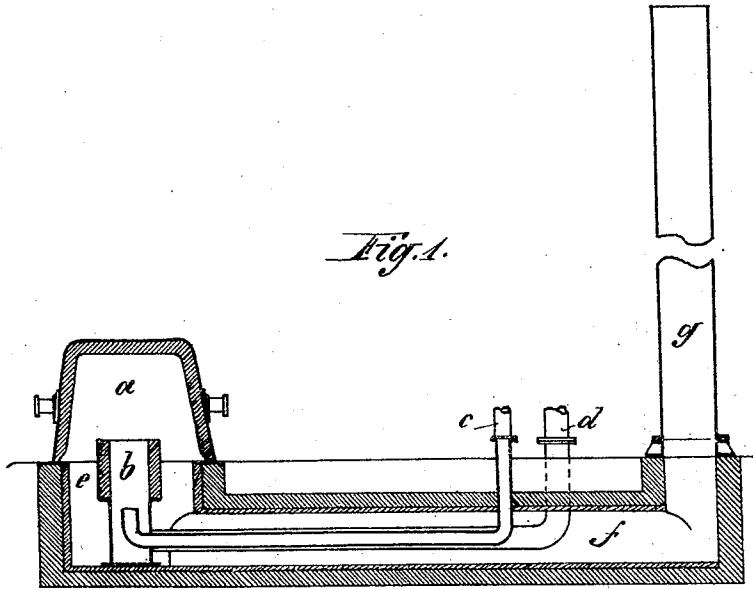
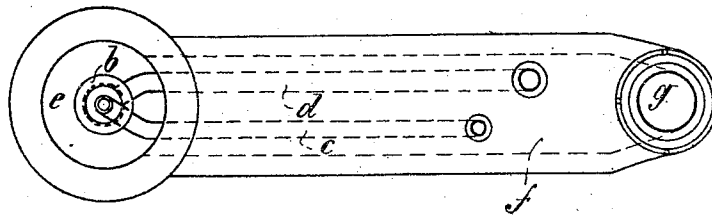


Fig. 2.



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APPARATUS FOR DRYING AND HEATING LADLES, &c.

1,057,905.

Specification of Letters Patent.

Patented Apr. 1, 1913.

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To all whom it may concern:

Be it known that I, EDGAR WIDEKIND, a subject of the King of Prussia, German Emperor, residing at Dusseldorf, in the Kingdom of Prussia, German Empire, have invented certain new and useful improvements in apparatus for drying and heating ladles rapidly and in such a manner that the internal coating of the ladle made of refractory material is not damaged.

At present the drying and heating of ladles is effected in such a manner that in the ladle coated with refractory material, a fire of wood, coal, coke, briquets, or gas is lighted, the open end of the ladle being directed upwardly. After the preliminary drying of the ladle it is turned upside down and placed upon a furnace to be heated to the required temperature. The ladle is situated at a certain distance above the fire so that the products of combustion can escape under the rim of the ladle. These well-known methods present a certain number of inconveniences. At the preliminary drying of the ladle which is in upright position, only a small part of the heat produced by the fire which is lighted in the ladle is utilized, the greatest part of the heat escaping at the open end of the ladle. It is not possible to preliminarily dry a ladle placed upside down because the vapors of the water and the tar adhere to the internal coating of the ladle and would escape only very slowly under the rim of the ladle. In any case the preliminary drying of a ladle turned upside down would require much time. Another inconvenience is that the smoke from the open fire is dangerous and unhealthy for the workmen and that further it darkens the windows and walls of the room or buildings.

This invention has for its object to improve the drying and heating of ladles in such a manner that this work is executed much more rapidly than it is possible at present, that the fuel is completely utilized, that no unpleasant effects arise from the smoke, and that the temperature in the ladle gradually increases during the drying and heating whereby the refractory coating is better preserved.

With the methods applied at present the drying of freshly coated ladles and the heating of the coating which is necessary before the ladle is in proper condition to receive the

molten steel form two separate operations 55 for the reason, that for the drying the open end of the ladle has to be directed upwardly while for the heating this opening is placed over the fire. According to the present invention the drying and the heating are effected in one operation and by means of one 60 and the same device.

For drying and heating the ladle a device is used which is shown in the accompanying drawings in Figure 1 in cross section, and in 65 Fig. 2 in a plan view.

The ladle *a*, coated in the well-known manner with refractory material, is placed over a furnace in such a manner that no smoke can escape under the rim of the ladle. 70

b is a gas burner mounted at the center of the drying and heating apparatus. The gas is supplied to the burner by the conduit *c* and the air for combustion arrives through the pipe *d*. Around the burner an annular 75 space *e* is arranged which is connected through the channel *f* with the chimney *g*.

The drying and heating of the ladle *a* coated with refractory material is effected in the following manner: The heat generated 80 by the burner *b* drives the water out of the coating of the ladle and the moisture together with the products of combustion is drawn off through the annular space *e* and the channel *f* owing to the draft of the 85 chimney *g*. The moisture cannot adhere to the surface of the coating of the ladle *a* as the heated air from the burner continuously moves along the surface of said coating drawing along the moisture and vapors as 90 soon as the same come out of the refractory material. The products of combustion flowing along the channel *e* heat the gas and air for combustion which arrives through the pipes *c* and *d* respectively, said pipes being 95 partly situated in the channel *f*. Owing to the progressive drying and heating of the ladle *a* the temperature of the products of combustion increases whereby gradually increases the temperature of the gas and air 100 for combustion and consequently also the temperature of the flame of the burner. The temperature of the heating device is automatically increased gradually, wherefrom results the advantage that the refractory 105 coating is better preserved. In order to obtain a better utilization of the calories contained in the products of combustion the

pipes *c* and *d* for the gas and air for combustion could be undulated in order to increase the heating surface.

I claim:—

- 5 An apparatus for drying and heating ladles, comprising in combination a hollow casing of suitable material forming a longitudinal channel, a vertical extension at one end of said casing having a circular hole, a
10 chimney connected with the other end of said casing, a burner centrally and vertically mounted in the front end of said casing, a gas pipe and an air pipe terminating in said burner and conducted through the longitu-

dinal channel of said casing so that the 15 gases of combustion and the moisture drawn off from the ladle flowing along said pipes heats the gas and air for combustion and consequently automatically increases the 20 temperature of the gases of combustion, substantially as described and shown and for the purpose set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

EDGAR WIDEKIND.

Witnesses:

LOUIS VANDORY,

THERESE THRANBEREND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."