J. W. KUNZLER.

METHOD OF CONSTRUCTING FURNACES AND FIRE BRICKS THEREFOR.

APPLICATION FILED SEPT. 15, 1914. RENEWED SEPT. 14, 1918.

1,285,244. Patented Nov. 19, 1918.

Fig. 1.

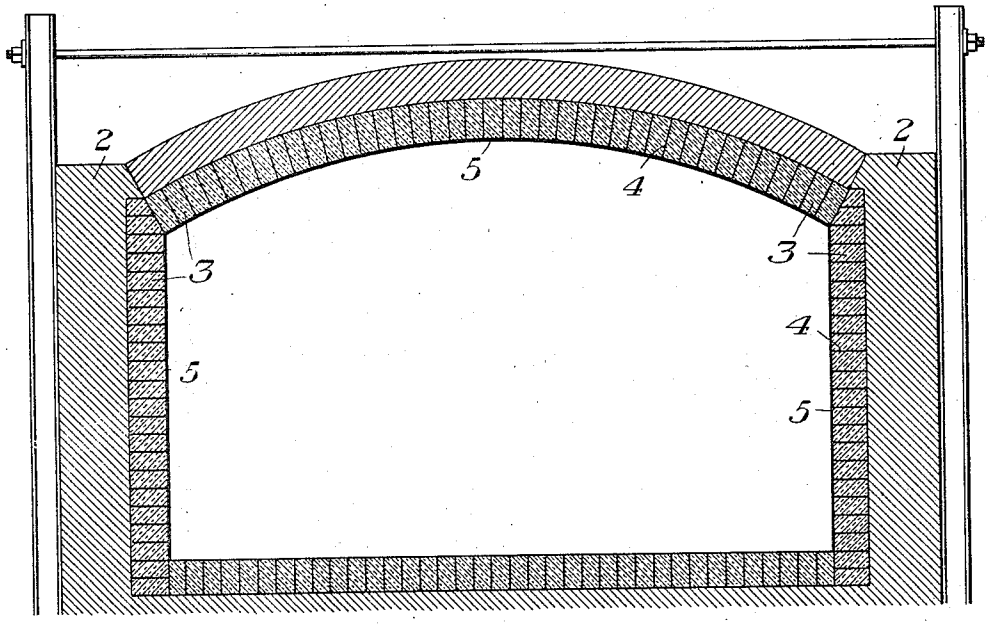
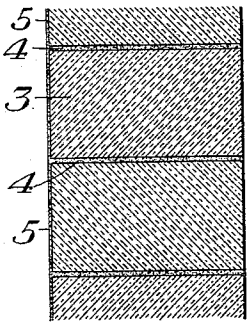


Fig. 2.



WITNESSES

R. A. Balderson

H. M. Corwin

INVENTOR

J. W. Kunzler,

by Bakewell, Byrnes & Parmele,

attys.

UNITED STATES PATENT OFFICE.

JOHN W. KUNZLER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO W. W. LAPHAM, OF PITTSBURGH, PENNSYLVANIA.

METHOD OF CONSTRUCTING FURNACES AND FIRE-BRICKS THEREFOR.

1,285,244. Specification of Letters Patent. Patented Nov. 19, 1918.

Application filed September 15, 1914, Serial No. 861,811. Renewed September 14, 1918. Serial No. 254,123.

To all whom it may concern:

Be it known that I, JOHN W. KUNZLER, a citizen of the United States, residing in Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Methods of Constructing Furnaces and Fire-Bricks Therefor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a transverse section of a portion of one type of furnace constructed in accordance with my invention, and

Fig. 2 is a section through a plurality of fire brick which have been treated and laid up in accordance with my invention.

This invention relates to an improvement in furnaces which are to be used with high temperatures for various purposes.

One of the objects of my invention is to treat fire brick so that it can be used for lining a furnace and as soon as the furnace is lined it can be fired and put into service. Another object of my invention is to treat the brick in such a manner that the exposed faces will be immediately covered with a glaze which will prevent spalling off of the faces of the brick, and also cut down the wear on the exposed surface of the brick caused by the frictional action of the gases, as well as greatly increasing the life of the bricks.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the material used for treating and coating the bricks, without departing from the spirit and scope of my invention, as defined in the appended claims.

Referring to the accompanying drawings, the numeral 2 designates a furnace of well-known construction having a fire brick lining 3, which is held in position by means of mortar 4 between the bricks and is provided with a facing 5.

A furnace constructed in accordance with my invention is built in the usual manner, and the fire bricks, which are exposed to the action of the hot gases, are first soaked in water and then laid in position, after the exposed faces are covered with a glazing material more fully hereinafter set forth. The spaces between the bricks are also preferably filled with the same material as is used for glazing the exposed faces of the bricks. As soon as the furnace has been completed and before the bricks or the facing material has dried out, I fire the furnace to its highest temperature. This high temperature immediately sets the facings of the bricks and forms a hard glaze over the exposed surfaces, so that the entire inner faces of the furnace are smooth and unbroken.

I have discovered that a furnace constructed in accordance with this method can be used as soon as it has been heated up to the proper temperature, and I have also discovered that the walls of the furnace will wear equally, irrespective of the differences in the various bricks, and although the faces of the bricks will be worn away by the friction of the gases, the exposed surfaces will still be provided with a glazed face, even after the bricks have been worn to a great depth.

I have discovered that good glazing material can be made by mixing fire clay with a solution of sal-soda and then boiling with live steam.

I am aware that it is considered highly essential to keep fire bricks at all times in such a manner that they will not be subjected to moisture and I am also aware that in all furnace constructions known to the art the furnaces are permitted to dry out before they are fired, but when the furnaces are fired they are usually started with a slow fire which is gradually increased so that the furnace is gradually brought to the temperature at which it is to be used. I have discovered that by first saturating the fire brick for the lining with water, then coating the exposed surfaces with a mortar made up of fire clay and an alkali solution and immediately heating to a high temperature, that the life of the lining bricks will be greatly increased and at the same time provide a furnace having glazed and unbroken walls exposed to the furnace gases.

The advantages of my invention result from the provision of a method of constructing and lining a furnace with a glazing material which is adapted to be fired immediately after the completion thereof to glaze the interior of the furnace to increase the life thereof. This immediate firing of

the furnace not only increases the life of the furnace, but materially reduces the time in putting a new furnace into commission, and also materially reduces the time an old furnace is out of commission when making repairs. By this method I am also enabled to provide the faces of bricks with a smooth and unbroken surface and thereby prevent the bricks from spalling.

Cross reference is hereby made to my copending application 250,851, filed Aug. 21, 1918, entitled "Mortar compound and method of constructing furnaces therewith."

I claim:

1. The method of constructing furnace linings, comprising the steps of saturating the furnace lining bricks with water, then laying up the bricks and coating the exposed surface of the bricks with a fire clay composition containing an alkali, and then immediately firing the furnace to set the coating, substantially as described.

2. The method of constructing furnace linings, consisting in saturating the furnace lining bricks with water, then laying up the bricks and coating the exposed surfaces with a fire clay composition, and then immediately firing the furnace; substantially as described.

3. The method of constructing furnace linings, consisting in saturating the lining bricks with water, then laying up the fire bricks and coating the exposed surfaces with a composition of fire-clay, alkali and water boiled with live steam, and then immediately firing the furnace; substantially as described.

4. A furnace, comprising fire brick lining which has been soaked with water and a facing formed of a mixture of fire clay and an alkali applied in a wet condition before firing, substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN W. KUNZLER.

Witnesses:

GEO. B. BLEMING,

JESSE B. HELLER.