UNITED STATES PATENT OFFICE.

JOHANN CHRISTIAN FELLNER, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO THE FIRM OF FELLNER & ZIEGLER, OF FRANKFORT-ON-THE-MAIN, BOCKENHEIM, GERMANY.

PREPARING DUST ORES FOR BLAST-FURNACES.

No. 801,144. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed May 1, 1905. Serial No. 258,391.

To all whom it may concern:

Be it known that I, JOHANN CHRISTIAN FELLNER, a subject of the German Emperor, and a resident of Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Preparing Dust Ores for Blast-Furnaces, of which the following is a specification.

In the German Patent No. 154,021 a method has been made known for roasting or preliminarily heating and sintering or fritting together powdered or reduced materials of all kinds. This method has been found to be particularly suitable for the preparation of dust-like or powdered ores for the roasting or calcining process in high furnaces. As described in the said patent, the flash of fire is directed not in a line parallel to the longitudinal axis of the inclined rotary kiln, but under a more or less sharp angle to this axis, whereby the maximum heat in the lower part of the kiln is controlled and made use of for causing the roasted material after its passage through the kiln to sinter and to form lumps or pieces, which can be at once worked off or smelted in the high furnace without the material requiring to be first turned into briquets. During this sintering or slagging operation in the inclined rotary kiln, however, it could not be avoided that the sintered mass settled down on the inside of the kiln and required to be knocked off with tools. Obviously the repeated application of the tools to the inside of the internal wall of the kiln or furnace already weakened in its hot state will result in the destruction of the inner wall. This danger was particularly great if one had waited for a certain time before knocking off the settled mass and was therefore obliged to use the tools with a greater force in order to remove the now very thick crust.

This invention relates to improvements in the said method, whereby the application of tools for knocking off the sintered or slagged mass is rendered unnecessary or at any rate reduced to a minimum in particularly different cases.

The improvements in the said method are as follows: When during the roasting or calcining process after a certain period the operator observes that considerable masses of the roasted or calcined material have settled down in the lower part of the inclined rotary kiln or furnace, the nozzle, which hitherto was directed under a more or less sharp angle toward the glowing mass is now so turned upward as to divert the flash of fire from the sintered or slagged mass. Then the latter will cool down to a certain degree, and, strange to say, this will in most cases suffice to cause the sintered or slagged mass to spring off or to loosen itself from the internal wall. In some cases this comparatively slight cooling may be found to be not quite sufficient. In such cases the nozzle may be left in its usual position under an angle to the glowing mass and only the supply of powdered coal need be stopped for a moment, so that only the wind will strike the settled-down mass and cool it considerably more than before, so that it is sure to spring off at once.

In the manner described all the roasted or calcined material, including the mass that has settled down on the inside of the internal wall, will be discharged from the kiln or furnace in the shape of lumps or pieces.

It will be seen that the described manner of freeing the internal kiln-wall from settled-down roasted or calcined material is very easy and simple and that the internal wall of the kiln or furnace will be preserved for a considerably longer time than hitherto. I do not mean, however, to say that the described method will render the use of tools unnecessary under all circumstances. It may be that during the springing off or automatic loosening of the material a part of it may still adhere to the inside of the kiln-wall; but then a comparatively slight effort in the use of the tools will be found to be ample for freeing the wall from this part.

Of course it is obvious that the described method may also be made use of with great advantage in cases where a gaseous combustible instead of powdered coal is passed through the nozzle, care being taken that the heated wind mixed with the gas be replaced by unheated wind for the purpose of loosening any adhering mass.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In the process of roasting or calcining disintegrated materials within a kiln with the aid of a mixture of air and combustible, the method of removing any sintered material adhering to the internal wall, which method con-

sists in comparatively cooling for a short time the sintered mass to cause it to spring off or to loosen.

2. In the process of roasting or calcining disintegrated materials within a kiln with the aid of a mixture of air and combustible, the method of removing any sintered material adhering to the internal wall, which method consists in shutting off for a moment the supply of the combustible while allowing the wind alone to strike the sintered mass, so that the latter is comparatively cooled and caused to spring off or to loosen.

3. In the process of roasting or calcining disintegrated materials within a kiln with the aid of a mixture of air and combustible, the method of removing any sintered material adhering to the internal wall, which method consists in shutting off for a moment the supply of the mixture and causing cold wind alone to strike the sintered mass, so that the latter is comparatively cooled and caused to spring off or to loosen.

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

JOHANN CHRISTIAN FELLNER.

Witnesses:
FRANZ HASSLACHER,
ERWIN DIPPEL.