

UNITED STATES PATENT OFFICE.

WILLIAM JOY, OF NORTHFLEET, ENGLAND.

MANUFACTURE OF CEMENT.

SPECIFICATION forming part of Letters Patent No. 331,243, dated November 24, 1885.

Application filed September 26, 1885. Serial No. 178,282. (No specimens.) Patented in England July 30, 1885, No. 9,154.

To all whom it may concern:

Be it known that I, WILLIAM JOY, of Northfleet, England, cement-burner, a subject of the Queen of Great Britain, have invented Improvements in the Manufacture of Cement, (for which I have made application for Letters Patent in Great Britain, No. 9,154, dated July 30, 1885,) of which the following is a specification.

10 My invention consists of the improvements hereinafter described in the process of manufacturing cement—such as Portland cement—by subjecting the mixture termed “slurry” while in a wet state to the action of heat in a kiln, which mixture consists of chalk and clay, or lime and clay, or lime and slag ground together with water.

According to my said invention I partly charge the kiln either in the usual way or in 20 any other suitable way and ignite the charge, and when the charge is well alight and the flames from the burning fuel are rising freely from the charge, I throw thereon wet slurry mixed with small coal or small coke, or the 25 screenings of coal or coke consisting of coal or coke in powder and small pieces, and ordinarily termed “breeze,” or other suitable fuel, depositing the wet mixture on those parts where the flames are issuing most freely. The 30 free passage of the hot gases through the charge at the parts where the wet mixture is lodged is thereby checked, and the draft through other parts of the charge is consequently increased. When, by the increased draft at such other 35 parts, the fuel at those parts is caused to burn freely, I deposit on them further quantities of wet mixture and thus force the flame and hot gases from the fuel to find vent at other parts of the charge, and so on until the moisture from 40 those portions of the wet mixture first deposited on the charge, as hereinbefore described, has been driven off by the heat and the fuel in the said mixture is burning and flame is issuing freely from the said portions, when I deposit thereon further quantities of the wet mixture. In this way I continue feeding the kiln 45 as the burning proceeds, until the kiln is fully charged, taking care that the draft through the charge shall not at any time be entirely stopped, but only deadened or partly closed at the parts

where, for the time being, the draft is greatest and the flames are issuing most freely. In case at any time the draft appears to be too much checked by the wet mixture, I relieve the draft by passing an iron rod down through the dried or partially dried slurry at the parts where the draft is checked. I obtain access to the kiln for this purpose by means of the ordinary aperture at or near the upper part of the kiln, which aperture is ordinarily termed the “load-eye,” and I feed the kiln with the wet mixture by shoveling it through the said aperture. No modification or alteration in the construction of the kiln is needed. When the kiln has in this way been fully charged, I allow it to 65 burn out and draw it in the ordinary manner; or I draw part of the burned clinker from the lower part before the upper part of the charge is burned out, and continue charging further quantities of the wet mixture at the upper part, 70 as hereinbefore described, and thus work the kiln continuously.

Instead of feeding the kiln with a mixture of wet slurry and fuel, it may be fed with wet slurry alone until a layer of sufficient thickness has been deposited, then with fuel, and then again with wet slurry until another layer of sufficient thickness has been deposited, and so on; but I prefer to feed the kiln with the mixture of slurry and fuel.

The consistence of the slurry or of the mixture of slurry and fuel may advantageously be about that of thick paste, as when of this consistence the slurry or the mixture can be conveniently shoveled into the kiln; but it is not 85 important that the slurry or mixture should be of this consistence. In preparing the mixture of slurry and fuel I take the slurry as it runs from the wash-mills, or I take it from the “backs” or settling-tanks and add the fuel 90 to it, which addition produces a mixture of convenient consistence. The quantity of fuel required to be added varies according to the weight of the clinker or cement required. The addition of about one part, by bulk, of fuel to 95 three parts, by bulk, of slurry is sufficient in ordinary cases.

By the process hereinbefore described the thorough exposure of every part of the charge to the maximum amount of heat is insured, the 100

charge when drawn being free from masses burned on the outside and only partly burned or raw inside, which are frequently found in drawing the charge from a cement-kiln fed or loaded in the ordinary way. Further, the whole expense of drying the slurry previously to charging it into the kiln is avoided, and consequently very great economy in the manufacture of cement is effected. The addition of the fuel to the slurry before burning it much facilitates the grinding of the clinker produced by the burning.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

The improvements hereinbefore described in the manufacture of cement, which improvements consist, essentially, in charging wet slurry or a mixture of wet slurry and fuel into a cement-kiln while the kiln is in action, the wet slurry or the mixture being deposited in successive portions on the burning charge in the kiln as the burning proceeds, and at the parts where, for the time being, the charge is burning most freely.

WILLIAM JOY. [L. S.]

Witnesses:

WILLIAM THOMAS WHITEMAN,
AUGUST DONNISON.