

UNITED STATES PATENT OFFICE.

FRANK E. BROWN AND WILFRED L. BROWN, OF MARE ISLAND, CAL.

IMPROVEMENT IN HYDRAULIC CEMENT.

Specification forming part of Letters Patent No. **154,641**, dated September 1, 1874; application filed June 11, 1874.

To all whom it may concern:

Be it known that we, FRANK E. BROWN and WILFRED L. BROWN, of Mare Island, Solano county, California, have invented a Hydraulic Cement, of which the following is a specification:

This invention or discovery relates to that class of compounds employed in the manufacture of artificial hydraulic cement; and it consists in the use of a certain substance termed coralline, coral rock, or fossil-coral, never before employed for this purpose.

Similar to the ordinary methods of compounding, drying, burning, and grinding the ingredients of chalk, limestone, slaked lime, quicklime, and clay, resulting in the production of hydraulic cements, our process consists in first thoroughly drying the said coralline and the clay required to be used, and then finely grinding or pulverizing them together in proportions from seventy-six (76) per cent. to eighty (80) per cent. of the coralline or coral substance, and from twenty-four (24) per cent. to twenty (20) per cent. of the clay, the said proportions being taken by weight.

The required proportions may be determined in the various qualities of the materials employed, either by practical trial of the mixed compound by burning and grinding the same into cement-powder, and afterward testing its quality as a hydraulic cement, or by chemical analysis, according to methods applicable to the general practice of artificial hydraulic-cement manufacture.

After the coralline and the clay are finely ground, the compound is to be thoroughly and intimately mixed with sufficient water, either hot or cold, to a plastic state. It is then to be formed into bricks of a size, say, of an ordinary

building-brick, and set aside for drying either by natural or artificial heat. The operation of water-mixing and forming the mixture into bricks may be performed by a machine resembling an ordinary pug-mill, provided with a molding aperture or former, which will deliver the mixed compound in a continuous rectangular prism, which may be cut off in lengths required for the bricks, the illustration of such a machine being shown in the ordinary brick-making machine.

The dried bricks are to be burned in a kiln with a heat sufficiently intense and prolonged to reduce them to a somewhat vitrified condition. When the kiln is sufficiently cooled, the bricks are removed therefrom, broken up and ground in the ordinary manner, in which burned hydraulic limestone is treated for hydraulic cement, the ground material constituting the powder of artificial hydraulic cement.

The manipulation of our process does not differ from the common methods adopted for the manufacture of artificial hydraulic cements with the well-known substances of chalk, limestone, slaked and caustic limes combined with a suitable clay, and we make no claim to the use of any of these substances or to any of the mechanical operations herein mentioned.

We claim as our invention—

The use of coralline, coral rock, or fossil-coral, as the substance may be called, for the manufacture and production of hydraulic cement.

FRANK EDWARD BROWN.
WILFRED LANGDON BROWN.

Witnesses :

A. P. VOORHEES,
T. H. CHANDLER.