

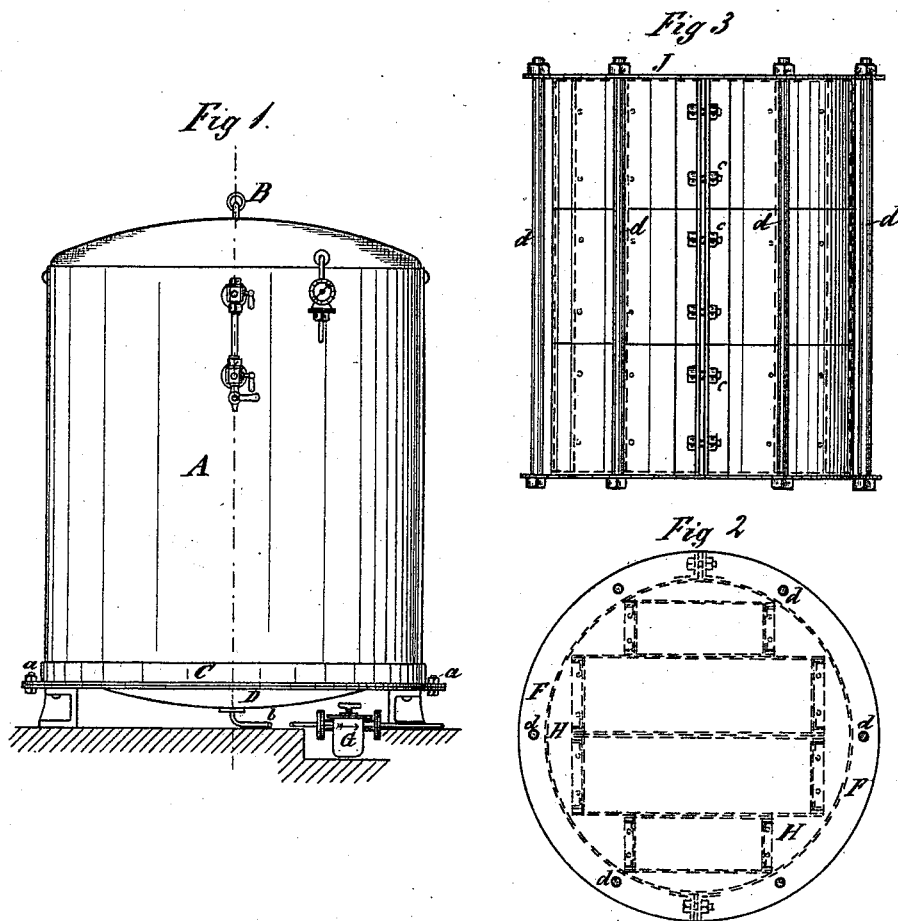
(No Model.)

F. ZERNIKOW.

APPARATUS FOR MANUFACTURING ARTIFICIAL STONE.

No. 493,141.

Patented Mar. 7, 1893.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRIEDRICH ZERNIKOW, OF ODERBERG, GERMANY.

APPARATUS FOR MANUFACTURING ARTIFICIAL STONE.

SPECIFICATION forming part of Letters Patent No. 493,141, dated March 7, 1893.

Application filed October 10, 1891. Serial No. 408,335. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH ZERNIKOW, a subject of the King of Prussia, residing at Oderberg, Germany, have invented certain new and useful Improved Apparatus for Manufacturing Artificial Stones; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to the manufacture of artificial stone and has for its object the provision of a novel apparatus for the production of the same.

This invention therefore consists in the construction combination and arrangement of parts as hereinafter described and specifically claimed.

In every application of burnt pulverulent lime in the manufacture of artificial stone it is necessary to provide means for resisting the expansion thereof on slaking, if it be desired to prevent any alteration in the form of the stone to be produced. In particular this is necessary in the process in which pulverized burnt lime is mixed dry with sand, slag-powder, or other siliceous substances then rammed into the molds and subjected to the action of high pressure steam, so as to effectually slake the lime; during this operation the expanding action of the slaking lime must be effectually resisted, so that the molds may not burst or be bulged outward the lime being thus forced to penetrate thoroughly into all the interstices between the granules of sand so as after hardening to produce perfectly hard dense coherent mass.

According to the present invention the requisite resistance to the expansion of the lime is afforded by inclosing the charged mold in a strong casing the interior of which is subjected to the pressure of high pressure steam, which, being exerted against the outer surfaces of the molds, will effectually resist any bulging or bursting action of the lime. When the molded objects to be produced, are not of such large dimensions that a single mold fills the said casing more or less entirely, such as large columns, it is for the sake of economical production desirable, to arrange the molds for the objects, that are most used, such as building blocks, slabs, steps, cornices &c., so that

they can be packed closely together within the casing, in order that the sides that are in contact, may afford each other mutual support against the expanding action, and may consequently be made less strong than would otherwise be necessary.

It is well known that the circular form is the only one that resists any deformation by an expanding pressure exerted uniformly in every direction such as that exercised by the slaking lime. On this principle is constructed the apparatus for carrying out the said operation as shown in the accompanying drawings in which Figure 1 shows the elevation of a vertically arranged cylindrical steam chamber A which can be raised in a vertical position from off the base D by a winch or crane by means of the ring B at top. To the lower end is riveted an annular flange C by means of which it rests upon the base D to which it may be secured by screw bolts *a a* with an intervening packing if necessary for forming a steam tight joint.

The steam chamber is provided with a branch pipe by which it is connected to a steam generator as also with a water gage and pressure gage. The water condensing in the chamber is led off at the bottom through a pipe *b* to a steam trap *g'* from which it can be discharged from time to time. The molds containing the material to be treated with steam are placed within this chamber, such molds being arranged as shown in plan and elevation at Figs. 2 and 3.

The size and arrangement of the molds may be variously modified; by way of example there are here shown four main molds, of which two are say fifty centimeters wide and twenty centimeters high and the other two ninety centimeters wide and respectively thirty centimeters and twenty centimeters high, while the length is determined by the length of the chamber, which in the present case is supposed to be one hundred and fifty centimeters. All the main molds or boxes are made of galvanized or tinned sheet iron secured by screw bolts at the edges. The principal molds have to be so made, that, when placed together, they can be embraced by the rings *F F* Fig. 2. which may be of iron or steel. Assuming that one of the smaller molds be laid down flat, it will present a cubic capacity

of one hundred and fifty centimeters by fifty centimeters by twenty centimeters to be charged with the compound; if this capacity be divided in its width by the two parallel plates running in the direction of the length, three equal compartments will be formed of one hundred and fifty centimeters length by twenty centimeters high and about sixteen and two-thirds centimeters width. These compartments are rammed as tightly as possible with the mixture of caustic lime and sand and are then closed by a cover screwed on. The mold or box thus filled and closed is now placed on end in the position shown in Fig. 2 upon the base D of the steam chamber, the casing H having been removed, and the other molds are then filled and treated in the same manner, after which the broad rings F' Fig. 2 are placed round them, these being made in halves, which are secured together by flanges and screw bolts.

As shown in Fig. 2 there remains between the rings and the sides of the molds spaces H, H, which may be filled in with wooden or metal filling pieces, which serve to transmit the pressure exerted on the inner sides of the molds to the rings F. After these are fixed on, a strong plate J is placed upon the upper ends of the molds and is secured to the base D, or to a plate placed thereon, by bolts *d*, *d*, so as to offer a support to the ends of the molds. The casing A, is now placed over the molds

thus tied together and is secured, steam tight, to the base and high pressure steam is admitted to the chamber and maintained there for some days. The steam will penetrate through the crevices of the rings F, and of the molds to the charges of the latter and will effect the slaking of the lime which will then harden to a solid mass with the sand, forming artificial stone.

The steam operates both as the agent for slaking the lime and for exerting pressure against the outer surfaces of the molds and preventing the molds from being bulged by the pressure of their contents.

Having thus described my invention, what I claim is—

In an apparatus for the production of artificial stone the combination with a closed chamber containing molds or boxes so placed together that they offer each other mutual support to withstand the bulging strain produced by the expansion of the contents in slaking, of the circular rings F, J, and stay bolts *d*, *d*, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of April, 1891.

FRIEDRICH ZERNIKOW.

Witnesses:

GEORGE MITCZENSKI,
JEAN GRUND.