Aug. 2, 1932. H. MISCAMPBELL 1,869,705

KILN

Filed Feb. 18, 1929

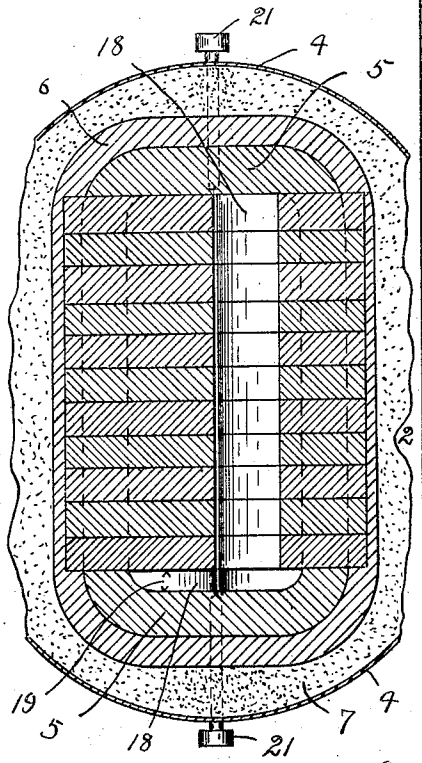


Fig. 2.

Fig. 1.

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UNITED STATES PATENT OFFICE

HUGH MISCAMPBELL, OF DULUTH, MINNESOTA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BLAW-KNOX COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

KILN

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This invention relates to kilns and has special reference to one particularly adapted for the burning of lime, and having incorporated therein a novel form of precast units.

The principal object is to provide a durable and efficient kiln of this character.

Another object is to provide an indestructible precast unit or baffle member for such a kiln, and one of convenient form for handling during the construction of the kiln.

Other objects and advantages of the invention will appear in the further description thereof.

Referring now to the accompanying drawing, forming part of this application, and wherein like reference characters indicate like parts:

Figure 1 is a vertical central sectional view through the lower portion of a kiln embodying the invention, and partly broken away, the slack arches being connected therewith; and

Figure 2 is a section on the line 2—2 of Figure 1.

1 and 2 represent two opposed furnaces or slack arches as are common in such devices, having located therebetween the vertically disposed chamber 3, which is a continuation of the central flue or retort of the stack of the kiln. This latter I have shown as comprising the outer metal sheathing 4 having built therein the stack proper comprising the fire brick lining 5 encased within the brick or concrete wall 6, and intermediate of which wall and casing is filled with sand or the like indicated at 7, such construction not forming any material part of my present invention.

In cross section the stack is preferably made somewhat elliptical or oblong in shape, having two opposed parallel straight side walls of considerably greater dimension than the diametrically opposite walls.

The chamber 3 intermediate of the furnaces 1 and 2 is formed with its opposed longer side walls converging upwardly as is common forming a somewhat restricted throat, directly above which is installed in staggered relation vertically a plurality of series of the improved baffle members. That is to say, the first row of such members as indicated at 8 being below a like row upon the opposite side as at 9, forming an inclined throat therebetween. The next succeeding row upwardly as at 10 is on the same side as the row or series 8, and the next on the opposite side, as at 11, and so on upwardly any desired distance, it being deemed that six of such rows of baffles are ample in the ordinary kiln to provide the desired functioning of indestructibility, though there is provided as is obvious a uniform zig-zag throat for passage of the material being burned. Above such installation I propose to continue substantially the same form of throat by installation of the bracket like baffles indicated at 12 and 13, made of fabricated material, they being subjected to less heat, able to withstand same.

I am aware that staggered metal baffles in a kiln are old, but the objection of their not being able to withstand the intense heat is overcome by this combination.

The novel form of precast baffle units illustrated, preferably approximate the form of the figure 4 in side elevation, though alternate rows are reversed in this respect, and provided with the triangularly shaped central opening 14 therein, they being rectangular in cross section and provided with upper and lower projecting portions 15 and 16 respectively on the opposite side of the inclined portion 18, these projections being for built-in anchoring engagement with the wall 6.

The vertical portions of the precast units when installed occurs in direct alignment with the fire brick lining 5, and forms substantially a continuation of same, though preferably slightly narrower. It is to be understood that these units may be of any desired size, but I prefer to make them of a size convenient for handling, and in which event ten or twelve may be employed for the construction of a complete baffle in an ordinary kiln as shown. In this event I propose to build each pair of baffles tightly against but one of the short walls of the flue or the kiln but in alternate arrangement vertically thereof, that is the two rows of baffles shown in Figure 2 of the drawing are tightly against the fire brick lining 5 on one side thereof, whereas at the opposite side a flue space 19

is left intermediate the sides of the baffle and the brick lining 5. This alternate formation of the baffles provides means whereby ample circulation of air occurs within the triangularly elongated chamber 14 in each baffle as well as a zig zag upward flue or retort passage for smoke and gases, or in other words tending to insure upward draft in the stack. It will be noted furthermore that this passageway is augmented by the angular chamber like spaces 20 that will naturally occur beneath the baffles, both precast and fabricated.

The precast sections of the indestructible baffles I propose to make of the same material as that of which the best quality of fire brick is composed, so that they will withstand the heat to which they are subjected.

Just below the lowermost baffle and communicating with the opposite sides of the chamber 3 is installed suitable radiation pyrometers 21, as is common in such devices.

From the foregoing it is evident that I have devised a simple and practical form of kiln particularly adapted for the burning of comparatively small units of limestone, or what is commonly known in the art as spalls and which now represent an enormous waste in the average quarry. Furthermore, in being able to continuously burn the small units of such material, a much more uniform and high quality product is produced than where larger chunks are submitted to more intense and destructive heat, and the operation being continuous, and much more uniform, the minimum of attention is necessary, resulting in less expense in the operation of the device.

It will readily be understood that in the burning of the smaller pieces of such material, a much more uniform feed is possible, requiring materially less attention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

A baffle for a kiln of the character described consisting of a plurality of precast hollow sections built into the walls of the kiln in close fitting relation to each other, and so arranged that the hollow portion of each baffle is closed at one end and open at the other in respect to the interior of the kiln.

In testimony whereof I affix my signature.

HUGH MISCAMPBELL.