

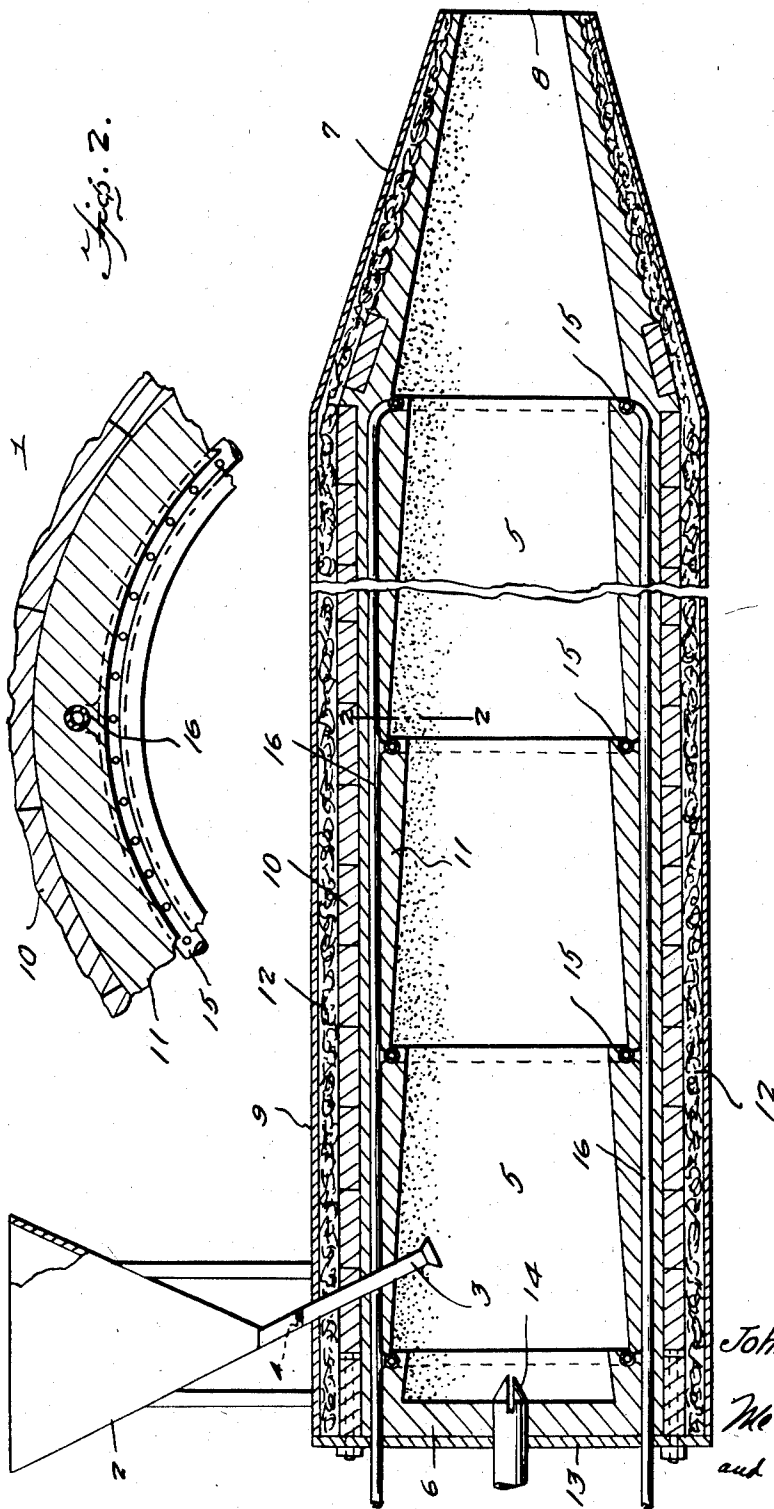
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J. L. FOURNIER

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MEANS FOR TRANSFORMING VOLCANIC ROCK

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Inventor
John L. Fournier
McMann, Dornan
and Davidson
Attorneys

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MEANS FOR TRANSFORMING
VOLCANIC ROCK

John L. Fournier, Los Gates, Calif.

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4 Claims. (Cl. 263—21)

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The present invention relates to a method for transforming volcanic rock and the like and means for carrying out the method.

The primary object of the invention is to subject pulverized perlite to a suitably high temperature flame while in transit under forced draft through a cylindrical crucible and thereby to transform the rock into merchantable matter of different color and less weight suitable to many uses.

Another object of the invention is to provide a non-rotatable crucible which is especially adapted to carry said method into effect.

A further object of the invention is to provide a volcanic rock crucible of simpler and more compact construction than that disclosed in prior devices.

With the foregoing and other objects and advantages in view, the invention consists of the novel method and means for carrying it into effect, hereinafter described and claimed.

In the accompanying drawings illustrating the mechanism employed,

Figure 1 is a longitudinal section of the crucible and

Figure 2 is a fragmentary transverse section of the crucible shell.

Like numerals are employed in the description and drawings to designate the same parts of construction.

1 is the crucible, 2 a hopper for reception of the volcanic rock and 3 the discharge chute or spout leading into the crucible. One or more such chutes may be employed and each is provided with a shut-off valve 4 to regulate flow of material to the interior chamber 5 of the crucible.

The crucible is non-rotatable and preferably cylindrical in form, with a closed rear end 6 and a tapered end 7 which is provided with a discharge opening 8. It is constructed with a cylindrical steel shell or case 9 of suitable length with a refractory annular lining 10 of fire-brick set in fire-clay 11. Between the steel shell or case 9 and the lining of fire-brick, an asbestos lining 12 is interposed. The rear end 6 is also made of fire-clay and on the outside thereof is bolted an annular plate 13. Centered therein is an oil-fuel nozzle 14 which is connected with a source of fuel supply and operated under pressure. The nozzle, which protrudes longitudinally in the crucible chamber, is of the flame or torch variety and is designated to direct a flame, at a suitable temperature, on the pulverized rock as it is fed into the crucible at the rear end of the chamber.

Suitably spaced apart and embedded in the fire-

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clay lining are a plurality of annular pipes 15 which serve as conduits of air under forced draft and are suitably connected to an outside source of supply by longitudinally-disposed pipe lines 16 also embedded in the fire-clay lining.

The pipe rings 15 are provided with a plurality of perforations opening into chamber 5 and serving as vents for air which is forced through the pipes. These perforations face in the direction of the crucible opening 8 and are positioned to direct currents of air towards the longitudinal center of the chamber. To facilitate the course of the currents from the vents the inner wall of the crucible is tapered towards the front 8, between the pipe rings in like manner. In the annular shoulders thus formed, the rings are embedded, with vents exposed.

The foregoing describes the means for carrying out the hereinafter described method.

The volcanic rock known as perlite is a heavy and dark stone-like material and ordinarily is not usable in the arts in its natural form.

In order to make it merchantable it is desirable to lighten its weight and remove its black color, changing the appearance to white. To do this it is processed as follows: Ground perlite is fed into a stationary crucible which is cylindrical and elongated and provided with a refractory lining. It is there subjected to a flame of predetermined temperature sufficient to act on the particles and thereby cause a change in weight and color, the weight being lessened and all color removed.

From the time of its entry into the crucible until it is discharged therefrom the perlite is caused to traverse the length of the crucible to the discharge opening by a forced draft of air operating on the material in enveloping currents and preventing contact between the perlite and the interior wall of the crucible.

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

1. An elongated, stationary crucible provided with a closed rear end and an open, discharge end, a refractory lining with cylindrical inner wall for said crucible, provided with a closed rear end and an open end registering with the discharge opening, a plurality of annular air conduits embedded in said crucible lining, suitably spaced apart and provided with a plurality of radial vents opening into said crucible and positioned to direct currents of air forwardly and away from said lining, a source of air supply for said annular air conduits, a flame-nozzle projecting longitudinally into the crucible at its rear, a

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source of fuel supply for said nozzle, and means for feeding rock material to the crucible contiguous to the flame-nozzle.

2. An elongated, stationary crucible, provided with a steel shell or case having a discharge opening at one end and a closure at the opposite end, a refractory lining with inner cylindrical wall in said crucible, a heat-resisting lining between the steel shell and the refractory lining, a refractory closure for said refractory lining at the rear end and an opening in the front end registering with the discharge opening of the crucible, a plurality of annular air conduits embedded in said refractory lining, suitably spaced apart longitudinally and provided with a plurality of radial vents opening into said crucible and positioned to direct currents of air forwardly and away from said lining, a source of air supply for said annular air conduits, a flame-nozzle projecting longitudinally into the rear end of the crucible, a source of fuel supply for said nozzle, and means for feeding rock material to the crucible contiguous to the flame-nozzle.

3. An elongated, stationary crucible provided with a steel shell or case having a discharge opening at one end and a closure at the opposite end, a refractory lining within said steel case comprising laminations of asbestos, fire-brick and fire-clay with an inner cylindrical wall forming a chamber, a refractory closure for said lining at the rear end of the crucible and an opening in the front end to register with the discharge

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opening of the crucible, a plurality of annular air conduits embedded in said refractory lining, suitably spaced apart longitudinally and provided with a plurality of radial vents opening into said chamber and positioned to direct currents of air forwardly and away from said lining, a source of compressed air supply for said annular air conduits, a flame-nozzle projecting longitudinally into the rear of the said chamber, a source of fuel supply for said nozzle, and means for feeding rock material to the crucible contiguous to said nozzle.

4. The crucible defined in claim 1, the said inner wall of the crucible being formed with a plurality of similarly tapered sections inclined towards the discharge opening of the crucible, forming shoulders in which the said annular air conduits are embedded with their vents exposed.

JOHN L. FOURNIER.

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