(No Model.)

2 Sheets—Sheet 1.

W. M. CONWAY.

CHEMICAL STOVE.

No. 386,967. Patented July 31, 1888.

FIG. 1

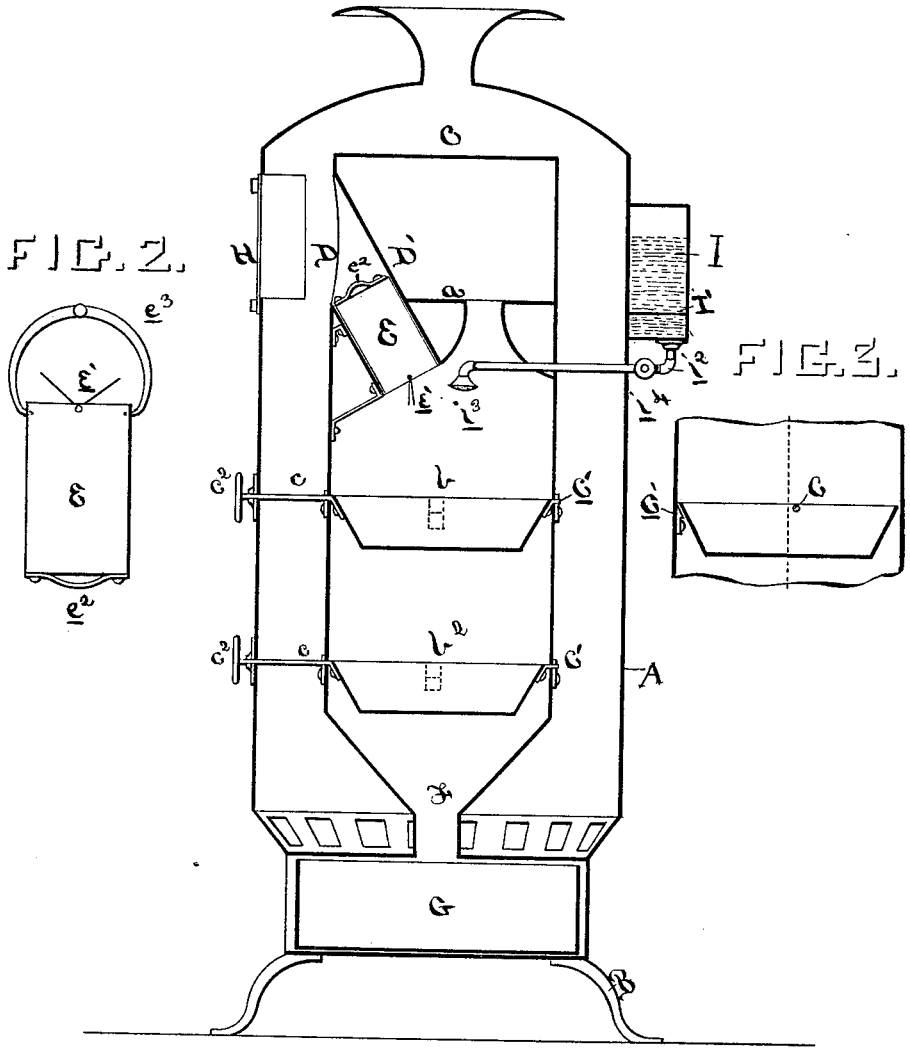

FIG. 2.

FIG. 3.

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(No Model.) 2 Sheets—Sheet 2.

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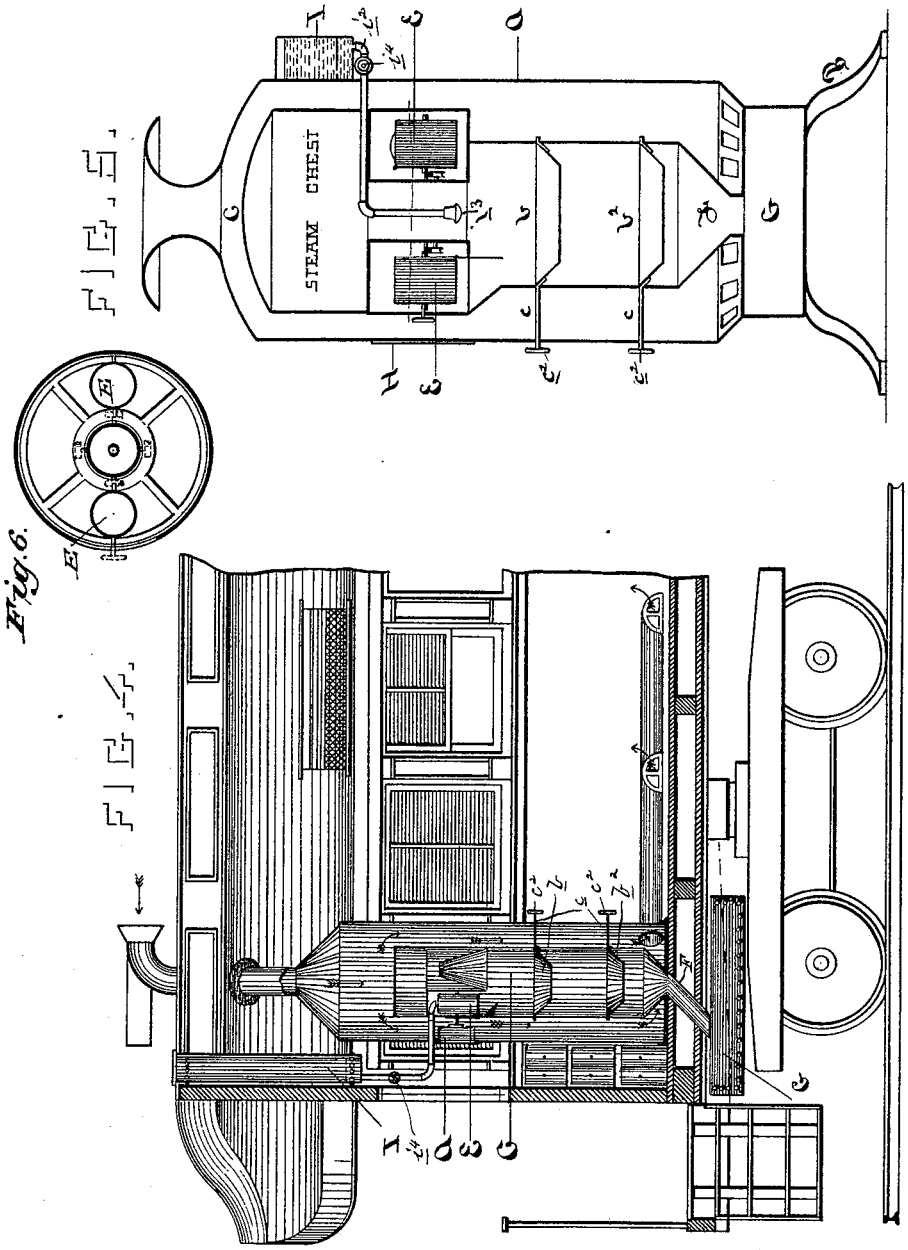

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM M. CONWAY, OF BALTIMORE, MARYLAND.

CHEMICAL-STOVE.

SPECIFICATION forming part of Letters Patent No. 386,967, dated July 31, 1888.

Application filed March 24, 1887. Serial No. 232,214. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. CONWAY, a citizen of the United States, and a resident of the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Chemical Heaters or Stoves, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, in which similar letters of reference indicate similar parts.

In the drawings, Figure 1 is a sectional elevation of my stove as used for heating a room or car. Fig. 2 is an elevation of the bucket used for charging the stove. Fig. 3 is a sectional elevation of the pan for receiving the charge, viewed from a point at right angles to the point of view of Fig. 1. Fig. 4 is a sectional elevation of a part of a railroad-car and of my stove in position as used upon such car. Fig. 5 is a sectional elevation of a stove of somewhat different form from those previously shown. Fig. 6 is a detail horizontal section.

My invention relates to that class of heaters in which quicklime is used as fuel, and the heat is derived by slaking the lime with water. Experience has shown that a very high temperature for a considerable period can be maintained by the combination of a quantity of quicklime with one-half its weight of water, and this principle I have utilized for the purpose of heating railroad-cars by a means that will not cause fire in case of an accident; and my invention consists in a novel construction and combination of parts, by means of which I carry my plan into effect.

In the drawings, Fig. 1 shows the stove as arranged for use in a car or room, but not permanently affixed to the car.

A is an exterior case, of iron, open at the bottom and top and standing upon legs B.

C is an interior case, which has but two apertures—one, D, in the side near the top, and which is closed by the insertion of the fuel-charger E, and the other, F, at the bottom, which is a funnel and empties into a closed drawer, G, beneath the stove. The upper part of the interior case or compartment is divided off by a diaphragm, *a*, in which there is an aperture, so as to form a steam-chest, in which the steam and other gases generated by the slaking of the lime may collect. This chest will act as a radiator. Midway of the interior case is hung upon pivots a pan, *b*. The pivots *c c*, as is shown in Fig. 3, are eccentric. On the side of the cylinder, and in such position as to form a rest for the edge of the pan, is a stop, *c'*, which maintains the pan in a horizontal position. One of the pivots is extended to the outside of the outer case, and is provided on the end with a wheel or crank, c^2. It will be seen that when the pan is turned by the wheel c^2 it cannot turn completely over, and will return to a horizontal position when released. Below this pan is a second one, b^2, of similar size and shape and similarly constructed.

The fuel-charger E is made preferably cylindrical, and with a lid, *e'*, hinged in the center. For convenience of handling, a permanent handle, e^2, is fixed to the bottom, and at the top the fuel-charger is provided with a removable bail, e^3, which is used to carry the fuel-charger.

Near the top of the interior cylinder is an aperture, into which is fitted a piece of cylindrical pipe, D'. Into this pipe the fuel-charger E is inserted, upside down, through the door H and aperture D. As this is done, the measured charge of quicklime in E is discharged into the pan *b*.

Mounted on the side of the exterior cylinder, A, is a water-tank, I, which is divided into two parts by a horizontal partition, I'. In this partition there is a small hole, so that the water will flow into the lower compartment very slowly, but constantly, requiring, say, thirty minutes to fill it. From the bottom of this lower compartment is led a comparatively large pipe, i^2, which enters the interior cylinder, and is provided on its end with a spray, i^3. This pipe is governed by a stop-cock, i^4, and will empty the compartment in, say, thirty seconds. It will be seen that, by calculation, the lower compartment of the water-tank can be arranged to hold the quantity of water necessary to slake the quantity of lime in the fuel-charger E.

The operation of the device is as follows: A requisite quantity of lime is placed in the fuel-charger E and delivered into the pan *b*. The cock i^4 is turned and the measured charge of water delivered upon the lime in pan *b*. Slak-

ing takes place and a high temperature is generated. This temperature will remain constant at a very high point for many hours; but for the purpose of maintaining the requisite heating-power in the stove I propose that a fresh charge shall be added about every two hours. The temperature of the first charge still being high at the end of two hours, I propose to retain it and derive all the work from it that can practically be procured by dumping it into the second pan b^2. When I desire to recharge b, and when another two hours have elapsed, charge No. 1 is dumped from pan b^2 into the drawer G, below the stove, from whence it can be removed and sold for any of the purposes for which it may be useful.

The air-space between the inner and outer cylinders forms a heating-chamber, in which air will be heated and, as it rises, escape from the top, to be supplied by cooler air from the bottom.

Fig. 4 shows the application of the above-described device to railroad-cars, and differs from the former only in reversing the direction of the current of air that passes over the heating-surfaces. In this view it is, as is usual in heating railroad-cars, forced down a pipe and back or forward through a car by the motion of the train. This view also shows below the car, at a convenient point to be emptied, the receptacle for receiving the slaked lime.

Fig. 5 shows a device similar in general construction to the others, but in which, instead of inserting a fuel-charger every time a charge is given, the fuel-chargers are arranged upon a revolving carriage, which carries several of them. They are pivoted and are discharged by being inverted without being removed from the interior of the cylinder. This form has the advantage of permitting the stove to be repeatedly charged without opening it.

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

1. In a chemical heater, the combination, with a cylinder, of one or more pans arranged within it, a chemical fuel-charger and a water-tank, arranged above the said pans to deliver their respective charges into the same, substantially as described.

2. In a chemical heater, the combination, with a cylinder, of a reversible pan pivoted within it, a fuel-charger and a water-tank arranged above the said pan and adapted to discharge their respective contents, as and for the purpose specified.

3. In a chemical heater, the combination of a cylinder and one or more reversible pans suitably mounted within said cylinder with a chemical fuel-charger and water-tank which is divided into sections, substantially as shown, both said fuel-charger and water-tank being suitably located to deliver their charges in said pan or pans.

4. In a chemical heater, the combination, with a cylinder in which the heat-generating chemical is retained while being slaked, of a water-tank having a discharge-pipe whose nozzle is within the cylinder, and having a partition which is perforated and arranged as shown, whereby it divides the tank into communicating compartments, one of which is supplied from the other and has the required capacity for a charge of water for slaking the chemical charge, as shown and described.

5. In a chemical heater, the fuel-charger open at one end and provided with a centrally-jointed lid, in combination with the stove-cylinder and pan for receiving the heat-generating chemical.

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Witnesses:
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