

M. H. RICE.
INCINERATOR.

APPLICATION FILED SEPT. 19, 1913.

1,093,592.

Patented Apr. 14, 1914.

Fig. 3.

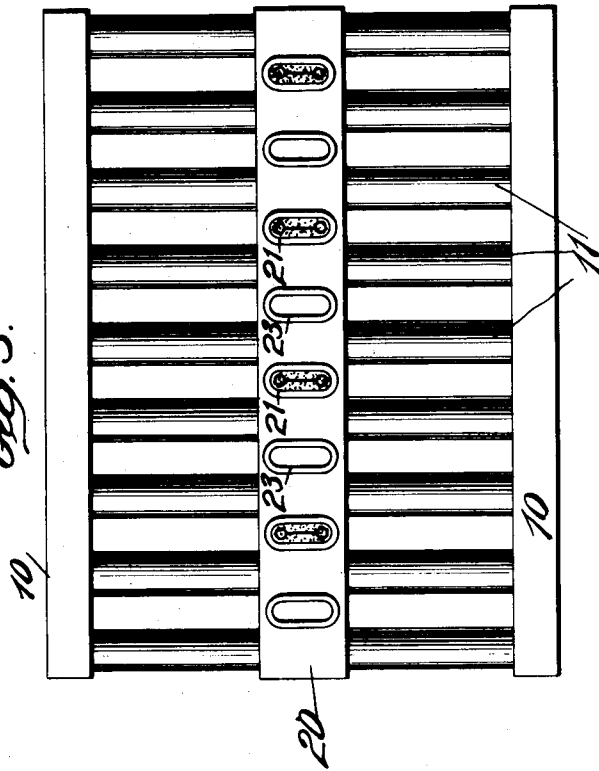
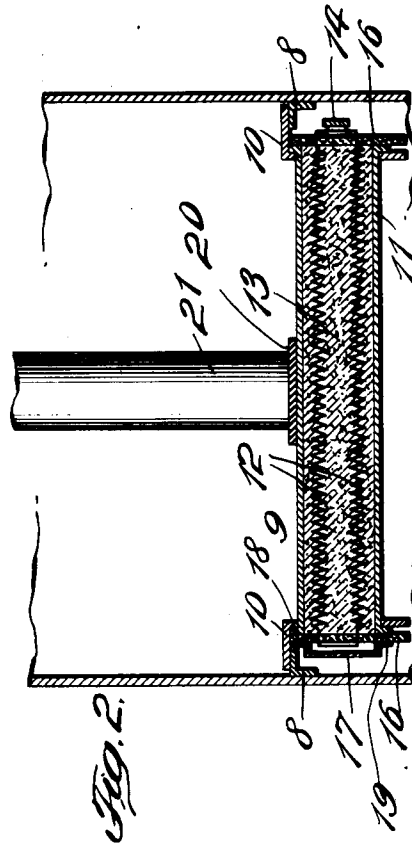


Fig. 2.

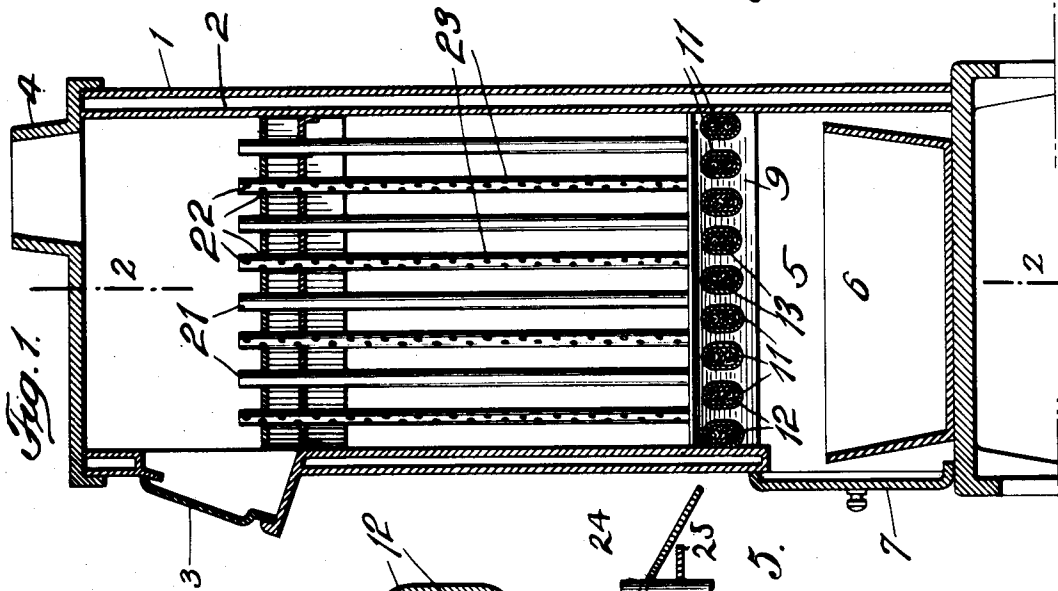


Fig. 4.

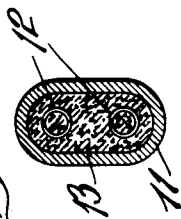


Fig. 5.

Witnesses:
Julius H. Rice
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UNITED STATES PATENT OFFICE.

MERRIT H. RICE, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO NATIONAL ELECTRIC UTILITIES CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INCINERATOR.

1,093,592.

Specification of Letters Patent.

Patented Apr. 14, 1914.

Application filed September 19, 1913. Serial No. 790,848.

To all whom it may concern:

Be it known that I, MERRIT H. RICE, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented new and useful Improvements in Incinerators, of which the following is a specification.

This invention relates to furnaces, and particularly to incinerators for burning such wet material as garbage and the like.

It has for its object the production of an incinerator which is especially strong and durable, which is inexpensive in manufacture, and particularly the production of an incinerator which will completely burn the wet or damp material to a dry ash in a relatively short space of time as compared with the time necessary for successful operation of heretofore known similar furnaces.

It is a desideratum in the art to which the present invention relates to produce an electric incinerator which when burning the wet or damp material will not become short-circuited because of flow of moisture from the material over the heating elements. Many attempts have been made to fill this want, but in apparatuses with which I am familiar these attempts have not been successful. In some instances wire gauze has been placed over the heating elements (which were in the form of coiled wires) but out of contact therewith and in such manner that the material to be incinerated was maintained out of contact with the heating elements. This form of device has not proved successful because the moisture trickles through the meshes of the wire and comes into contact with the coiled wires, thus short-circuiting the heating elements. Such types of devices also are subject to the disadvantage that radiant heat has to be relied upon, because of the spaced relation of the material support and the heating elements.

It is an object of the present invention to produce an incinerator having a grate or floor section preferably composed of a plurality of bars, upon which the damp material may be directly placed and which will not become short-circuited when so used.

The invention has also for its objects the production of an incinerator in which the material to be dried or burned may be heated throughout its mass, and this is accomplished by producing an auxiliary heater which may be either permanently or remov-

ably connected to the main heater or grate, such auxiliary heater consisting of alternate heating elements and flues extending from the main grate to points preferably above the normal level of the material to be burned and having means for distributing hot air throughout the mass and thus pre-heat and agitate the same, so that it may be quickly consumed. This auxiliary heater may consist of any form of heating elements, but I have found in the best form in which my invention is embodied that several tubular, perforated, vertical tubes to supply air through the mass, and several vertical heating units having (preferably electrical) heating elements are very successful.

In the accompanying drawings showing one form of a specific embodiment of my invention and in the several views of which similar reference numerals designate corresponding parts, Figure 1 is a vertical section through an incinerator; Fig. 2 is a vertical section along line 2-2 of Fig. 1; Fig. 3 is a top plan view of the compound heating element; Fig. 4 is a transverse section through one of the electrical heating units; and Fig. 5 is a transverse section through the hood.

Referring to the drawings, 1 indicates an incinerator having the double walls forming heat insulating space 2. The door 3 toward the top serves for the introduction of material, flue 4 for the escape of gases and for causing a draft, and ash bed 5 with its pan 6, for the collection and removal of dry ashes through the door 7. The walls 1 are provided with irons 8 forming guides and supports for the heating unit 9, which may be readily placed in position and removed.

The heater may be a compound heater or a single heater. I shall first describe the single heater: It is composed of a frame forming flanges for engagement of the guides and supports of the furnace body, and a plurality of transverse heating units preferably removably secured in the frame. These heating units are seamless steel tubes forming shields and containing heating elements of carbon or wire 12, here shown as resistance wires 12 suitably embedded in an electric insulating, heat conducting, preferably vitreous, refractory material 13. This construction permits large heating surfaces upon which the wet material may be directly placed. The coiled wires of the sev-

eral units may be connected in series through the bus-bar 14 and are insulated at the ends of the units by asbestos sheets 16 suitably housed by means of the cap 17 flanged at 18 and 19 and screwed or riveted in place.

The compound heater consists of the single heater just described or its equivalent and an additional heater which may comprise a frame 20 adapted to rest on top of the frame 10 of the main heater and upright heaters carried by the frame. The additional heater has several preferably vertical flues 23 leading from the main heater to points above the normal level of the material on the grate. These flues are perforated as at 22 throughout their length, thus serving to supply hot air from the vicinity of the grate to separate points throughout the mass of material. This not only preheats or predries the mass of the material, but allows passage of air through it so that it may completely burn and not merely bake or char on the outside. This baking of the garbage and the like has heretofore been very difficult to overcome, it being frequently necessary to open the doors of incinerators and stir the mass in order that it may be consumed. Any sufficient number of these flues may be employed and their lengths and positions with respect to the main furnace and grate may be varied to suit different conditions. I have here shown four such flues perforated throughout their length and terminating at their upper ends just above the door bottom. They are also shown as resting just above the grate, but I may, of course, allow them to extend below the grate bars or slightly within the ash pit if desirable. The auxiliary heater in the present embodiment of the invention also comprises heating units 21, which are attached to the frame 20, and which are arranged to alternate with the flues 23. These heating units are preferably of the same construction as those used in the main grate and may have their heating elements 12 connected in series or multiple with those of the grate or may have separate connections to a different source of electricity. The auxiliary heater may be placed directly on top of the main grate and I have so shown it in the accompanying drawings. In order that the flues and heating units may be supported at their upper extremities, the bar 25 is attached to them, and this bar supports the hood 24, so that material placed in the incinerator is guided to either side of the line of units and flues. The single or duplex grate may be pivotally connected to the furnace body in any known manner or may be made in several pivotal sections for the purpose of dumping ashes, but I have not shown such details as they form no part of the present invention.

The invention is not to be considered as

limited to the exact constructions shown in the drawings, as they are illustrative only. I consider myself entitled to all substitutes and equivalents within the scope of the following claims. I believe myself to be the first to produce an electrically heated incinerator in which the material may be placed directly in contact with the heating unit and an electric incinerator in which auxiliary heating means are employed.

While I have described my invention as an incinerator for garbage and the like, it is to be understood that it is not limited to use in connection with such material.

With very few changes apparent to a skilled mechanic, the device may be used as a crematory or may be altered for use as a furnace for use in burning and consuming animal and vegetable matter.

What I claim is:—

1. In an incinerator, the combination with the furnace walls, of a grate adapted to support wet material and comprising spaced heating units containing heating elements embedded in refractory insulating material.

2. In an incinerator, the combination with the furnace body, of a heater adapted to support the material to be burned and having an auxiliary vertical heater comprising means to heat the material above the level of the first said heater.

3. In an incinerator, the combination with the furnace body, of a grate having heating means and an auxiliary heater comprising means to heat the material above the grate and to supply air in the mass of material.

4. In an incinerator, the combination with the furnace body, of a grate having heating means and an auxiliary heater comprising means to supply air in the mass of material and additional means to heat the mass at points above the grate.

5. In an incinerator, the combination with the furnace body, of a grate having heating means and an auxiliary heater comprising means to supply air in the mass of material, said means consisting of flues leading from the vicinity of the grate to the material perforated along their lengths.

6. In an incinerator, the combination with the furnace body, of a heater having an auxiliary heater comprising insulated electric resistance units leading from the vicinity of the grate through the material.

7. In an incinerator, the combination with the furnace body, of a main heater having an auxiliary heater comprising means leading from the vicinity of the main heater through the material, some of said means arranged to supply air through the material and some of said means having additional heating means.

8. In an incinerator, the combination with the furnace body, of a main heater having an auxiliary heater comprising means lead-

ing from the vicinity of the grate through the material, some of said means being electrically heated, and other of said means being heated by air from the main heater.

5 9. In an incinerator, a grate comprising horizontal electric units in the form of grate bars and a vertical auxiliary heater operable in connection therewith.

10 10. In an incinerator, a horizontal grate comprising electric units in the form of

grate bars and a vertical auxiliary heater operable in connection therewith and comprising electrically heated units.

In testimony whereof, I have hereunto set my hand in the presence of witnesses, 15 this 18th day of September, 1913.

MERRIT H. RICE.

Witnesses:

C. C. VAN GLAHN,
ALFRED M. HOUGHTON.