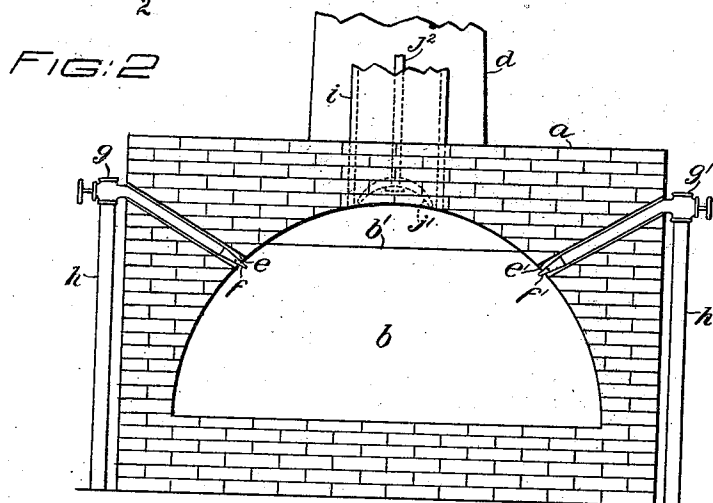
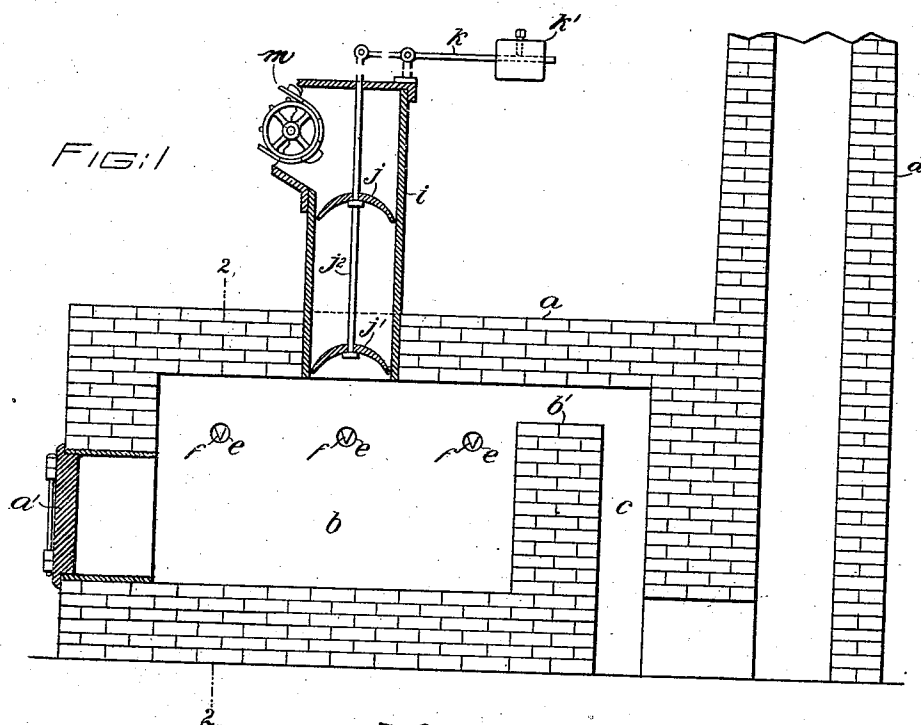


(No Model.)

N. DOWLING.
HYDROCARBON INCINERATING FURNACE.

No. 501,458.

Patented July 11, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

NORTH DOWLING, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
AMERICAN INCINERATING COMPANY, OF SAME PLACE.

HYDROCARBON INCINERATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 501,458, dated July 11, 1893.

Application filed March 3, 1893. Serial No. 464,532. (No model.)

To all whom it may concern:

Be it known that I, NORTH DOWLING, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hydrocarbon Garbage-Incinerating Furnaces, of which the following is a specification.

My invention has relation to hydrocarbon furnaces for the incineration of garbage or refuse matter; and it relates more particularly to the construction and arrangement of the parts thereof.

The principal objects of my invention are first, to provide a comparatively simple and reliable furnace for effecting the incineration of garbage or refuse matter; and second, to provide a hydrocarbon furnace with simple, durable and effective means for introducing garbage or refuse matter into the same for effecting the incineration thereof.

My invention consists of a hydrocarbon furnace constructed and the parts thereof arranged for operation in substantially the manner hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a longitudinal central section through the furnace, showing the automatic means for permitting of the introduction of refuse matter into the same embodying one of the features of my invention; and Fig. 2, is a transverse section on the line 2—2, of Fig. 1, showing the disposition of the hydrocarbon jet burners embodying the other feature of my invention.

Referring to the drawings *a*, is a furnace constructed of brick or other suitable material and provided with an arched combustion chamber *b*, an off-take *c*, and chimney or stack *d*. In the side walls of the furnace are provided tapering apertures *e* and *e'*, for the insertion of jet tube burners *f* and *f'*, which are provided with stop-cocks *g* and *g'*, coupled to pipes *h* and *h'*, connected with a hydrocarbon or oil supply not shown. These jet tube burners *f* and *f'*, are disposed in the arch of the combustion chamber *b*, of the furnace *a*,

at an angle to the plane thereof, and extend a short distance into the same in order that a downward jet flame from opposite points or directions of the combustion chamber, may be presented to the refuse mass deposited therein for the incineration or reduction thereof to a pulverized state or condition, when the same may be drawn out by suitable appliances through the door *a'*, of the furnace, for use as a fertilizer or for other purposes. During the incineration of the refuse mass such fumes as well as gases unconsumed together with smoke pass over the bridge wall *b'*, to the downward off-take *c*, and thence pass in an upward direction through the chimney or stack *d*, into the open air.

The refuse matter or garbage such as deposited in the furnace to be reduced is usually in only a more or less dry state or condition and thus intense heat is required to effect the rapid and complete or thorough and economical incineration thereof and practice has demonstrated that upward flames or jets introduced from the bottom of the mass do not give satisfactory results, because the mass having presented thereto such a flame is only partially consumed; and moreover, the waste of fuel and time required to dry out the mass is expensive. The hottest part of the furnace is naturally above the mass and around or about the arched wall of the combustion chamber of the furnace, so that the surface is dried out or the moisture contained therein evaporated to dryness, thereby assisting in the work of the jet tube or vapor burners in effecting the incineration of the body of the mass. The arrangement of jet tube or vapor burners as illustrated in Fig. 2, presents the flame under pressure to the mass in the form of flame darts that permeates the entire body thereof in downward directions and at different angles to the plane of the furnace and as practice has demonstrated not only to quickly but thoroughly incinerate or reduce the deposited refuse matter to an ash for fertilizing and other purposes. Moreover, the zone of high temperature above the mass by the intense heat arising from the flames issuing from the jet tube or vapor burners tends in its constantly excited condition to consume the noxious gases arising from the conglom-

erate mass undergoing treatment, so that comparatively little or no odors of an offensive character are given off with the smoke issuing through the chimney or stack into the open air. This is one of the important features of the furnace of the present invention and which is due to the construction and arrangement of the parts thereof and the facility for effective work being done therein.

Furthermore, the jet tube or vapor burners arranged in substantially the manner illustrated in Fig. 2, effect in a remarkably short period of time a complete incineration of the refuse mass, such as garbage, and with an economical expenditure of fuel and time in the conduct of the work of reducing the same.

In the top of the furnace is provided a chute or chamber *i*, provided with valve seats *j* and *j'*, for respectively closing the inlet to the chute *i*, from the endless conveyer *m*, and the outlet of the chute *i*, to the combustion chamber *b*, of the furnace *a*. These valves *j* and *j'* are provided with a connecting-rod *j²*, connected at its upper extremity to a pivotally supported cross-rod *k*, having an adjustable counterbalance *k'*. This cross-rod *k*, is pivotally supported to the chute or open top chamber *i*, in any preferred manner. The refuse matter to be incinerated is dumped into the chamber or chute *i*, and in coming in contact with the valve seat *j*, the same by the weight thereof is depressed beneath the outlet of the chamber leading to the furnace which causes the counterbalance *k'*, mounted on the pivotally supported cross-rod *k*, to be actuated, whereby the deposited matter in the chute *i*, is dumped into the combustion chamber *b*, of the furnace *a*, maintained as requirements demand at a high temperature through the jet tube burners *f* and *f'*, regulated as to the extent of the flame extending downward into the combustion chamber by means of the stop-cocks *g* and *g'*, so that uniformity of action as to the reduction or incineration of the matter is at all times insured and a material economically obtained as a resultant product for fertilizing and other somewhat analogous uses.

When the refuse matter to be incinerated from the conveyer *m*, has been deposited into the chamber *i*, and thence dumped into the combustion chamber *b*, of the furnace the valves *j* and *j'*, again respectively assume their

normal positions by the action of the counterweight *k'*, as illustrated in Fig. 1, with the valve *j*, closing the inlet of the chamber *i*, in proximity to the conveyer *m*, and the valve *j'*, closing the outlet, leading to the combustion chamber of the furnace *a*.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, a hydro-carbon incinerating furnace provided with an arched combustion chamber, and a series of jet tube or vapor burners projecting downward through the arched wall of said chamber and into the same at an angle to the plane of the furnace for effecting incineration of matter deposited in said chamber, substantially as described.

2. In combination, a hydro-carbon incinerating furnace provided with an arched combustion chamber, a series of jet tube or vapor burners provided with stop-cocks and projecting through the arched wall of said chamber at an angle to the plane of the furnace and a chute provided with counter-balanced valves for opening and closing the inlet and outlet of said chute, substantially as described.

3. The combination with a hydro-carbon incinerating furnace provided with an arched combustion chamber, and a series of jet tube or vapor burners provided with cocks for regulating flame issuing therefrom, of an endless conveyer and a chamber provided with an automatically controlled valve or valves for opening and closing the inlet and outlet of said chamber, substantially as and for the purposes described.

4. In combination, a hydro-carbon incinerating furnace provided with an arched combustion chamber having a series of controlled jet tube or vapor burners extending downward through the wall thereof and a vertical chute provided with an inlet and an outlet having automatically controlled valves and mechanism for actuating the same, substantially as and for the purposes described.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

NORTH DOWLING.

Witnesses:

THOMAS M. SMITH,
RICHARD C. MAXWELL.