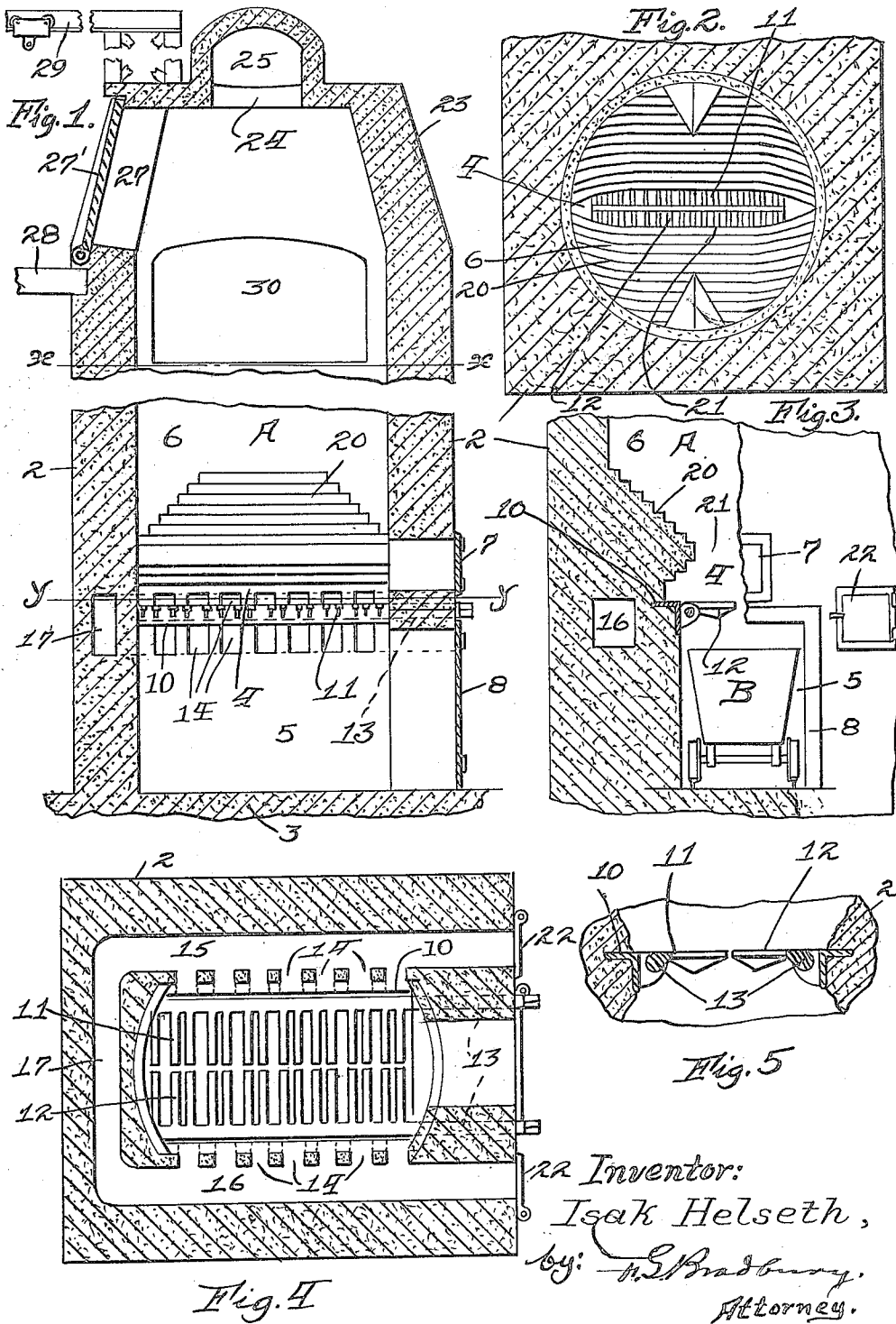


I. HELSETH.
INCINERATING FURNACE.
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1,403,243.

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Inventor:
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UNITED STATES PATENT OFFICE.

ISAK HELSETH, OF THIEF RIVER FALLS, MINNESOTA.

INCINERATING FURNACE.

1,403,243.

Specification of Letters Patent. Patented Jan. 10, 1922.

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To all whom it may concern:

Be it known that I, ISAK HELSETH, a citizen of the United States, residing at Thief River Falls, in the county of Pennington and State of Minnesota, have invented a new and useful Improvement in Incinerating Furnaces, of which the following is a specification.

This invention relates to improvements in incinerating furnaces for the burning or incineration of garbage, refuse and the like. More particularly this invention relates to a furnace structure which is adapted to cooperate with means such as is disclosed in Patent #1,245,914, granted to me November 6, 1917, for preparing and introducing garbage, refuse and the like thereinto. One of the objects of this invention is to provide a simple and effective apparatus whereby the material may be conveniently and economically destroyed, the subject matter of this application however constituting that portion of the incinerator forming the fire place into which the material after being dried is fed and consumed. My present invention relates more particularly to the furnace structure, which is provided with improved means for maintaining combustion, so as to secure rapid and free burning of the material and for supporting such material in exposed position upon the grate and within the combustion chamber.

A still further object is to provide improved means for supplying air to the grate for the purpose of most effectively burning the mass and promoting combustion. With these ends in view, my invention comprises the features of construction and combination of parts hereinafter more particularly described and claimed.

In the accompanying drawings forming part of this specification, Fig. 1 is a vertical section of my invention, portions thereof being broken away; Fig. 2 is a section taken on the line X—X of Fig. 1; Fig. 3 is a front elevation of a detail, part of the structure illustrated being a section; Fig. 4 is a section taken on the line Y—Y of Fig. 1, and Fig. 5 is a section of a detail.

In carrying my invention into practice, I provide a furnace A, the body walls 2 of which are constructed of brick or other suitable material resting upon a concrete foundation 3. The furnace is provided with a fire place or box 4, an ash pit 5 and combustion

chamber 6, said ash pit being so constructed that a truck B may be employed to receive the ashes and remove them. The fire box and ash pit have at the front of the furnace, doors 7 and 8 respectively for the supply of fuel and the removal of the truck. Within the bottom of the fire box is arranged a grate to support the body of fuel employed, which grate preferably consists of a metallic frame work 10, carrying rocking grate bar sections 11 and 12. These grate bar sections have rods or shafts 13 projecting through the furnace wall which are adapted to be engaged by a lever or other means for transmitting rocking motion to the grate sections to dump the ashes, etc.

Formed in the furnace wall around the grate is an air feed duct comprising a pair of parallel channels 15 and 16, located on opposite sides of the fire box and connected at the rear by a cross channel 17 (see Fig. 4), which channels surround the fire box on three sides and communicate with the fire place through opposite series of ports 14 in line with and above and below the grate, whereby a course of circulation for the supply of air in the fire box around, above and below the grate is provided to support combustion to a highly efficient degree, the air being preheated during its passage by the hot walls of the furnace, so as to oxygenate the burning mass of fuel to the highest possible degree. The fire box and combustion chamber may be made out of any suitable fire resisting material such as fire brick or the like, and the fire box communicates at its upper portion with the base of the combustion chamber. As shown the base of the combustion chamber is provided at two of its opposite sides with downwardly converging sloping walls 20, which are preferably stepped, and which overhang the fire box and contract the top of the same forming a long narrow passage 21 to permit the flames from the bed of fuel on the grate to pass upward into the combustion chamber, while at the same time holding the body of garbage or refuse material supported against any tendency to smother the flames or choke the flame outlet. By this means the body of fuel will be protected and provision made for insuring the incineration of the garbage or material above in a rapid manner. A draft door 22 of suitable construction

struction may be provided for controlling the end of each of the air flues 15 and 16.

The body of the combustion chamber is of substantially uniform diameter and extends up to a predetermined height. The upper end of the combustion chamber is formed with a hollow frusto conical shaped dome 23 terminating at its upper extremity in an outlet 24 which discharges into the flue 25. At one side of the upper part of the combustion chamber is an opening 27 through which the refuse garbage or any material to be incinerated may be placed in the furnace when desired, said opening being closed by an outwardly swinging door 27'. When the door is tipped back, it acts as a chute above the platform 28, so that material can be unloaded readily from wagons or receptacles and guided into the furnace. The top walls or lining of the furnace may be made out of any suitable fire resisting material. The rail or beam track 29 disposed above the platform 28 facilitates the handling and discharging of heavy material above the platform and into the furnace. The upper part of the combustion chamber is also provided with a lateral passage 30 through which wet garbage or material to be incinerated may be introduced by any suitable means, such as fully illustrated in my Patent #1,245,914 above referred to, and through which heated gases from within the furnace may pass for drying wet refuse and garbage which enters the combustion chamber through the passage 30.

In accordance with the patent statutes, I have described the principles of operation of my invention together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the construction shown is only illustrative, and that the invention can be carried out by other means and applied to uses other than those above

set forth within the scope of the following claims.

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

1. An incinerating furnace, comprising, in combination, a combustion chamber having an outlet for smoke and gases and an inlet through which refuse may be fed, a fire place, an ash pit below said fire place, and a grate supported in said fire place, the walls of said fire place being formed with a horizontal draft passage extending along each side of the grate and having ports, each of said ports entering the fire place immediately above and below said grate and with a pair of inward projections above said grate forming a narrow horizontal aperture through which the material supported upon said projection is exposed to fire on the grate, said draft passage leading from the exterior and supplying draft to said fire through said ports above and below said grate and said projections supporting refuse to be consumed spaced above said grate in effective position to support combustion.

2. An incinerating furnace, comprising, in combination, a combustion chamber having an outlet for smoke and gases and an inlet through which refuse may be fed, a fire place, an ash pit below said fire place, and a grate supported in said fire place, the walls of said fire place being formed with a draft passage leading horizontally from the exterior and along each side and across the rear portion of said grate, and with a series of ports along each side of said grate, each of said ports leading from the adjacent portion of said passage into said fire place and ash pit immediately above and below said grate.

In testimony whereof, I have signed my name to this specification.

ISAK HELSETH.