A. H. DAVIDSON & S. SUNDELIUS.

CREMATION FURNACE.

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1,068,571.

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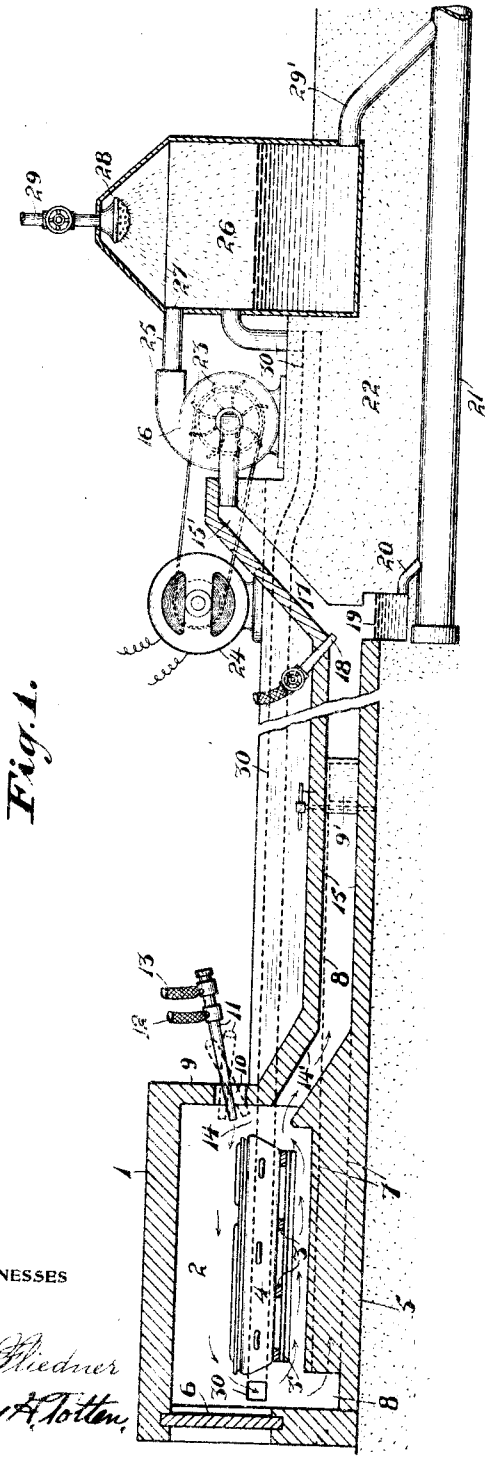

Fig. 1.

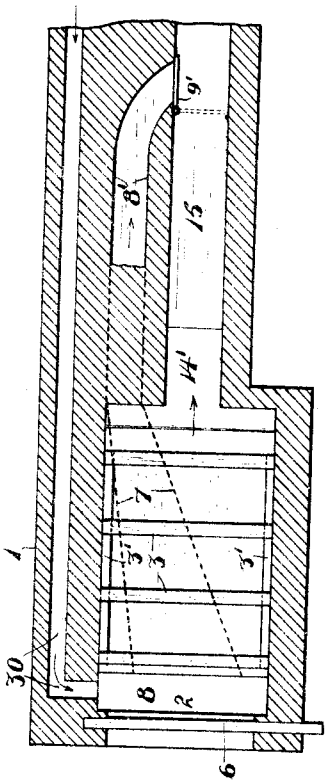

Fig. 2.

WITNESSES

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ALEXANDER H. DAVIDSON AND SEVERUS SUNDELIUS, OF COLMA, CALIFORNIA.

CREMATION-FURNACE.

1,068,571. Specification of Letters Patent. Patented July 29, 1913.

Application filed September 30, 1912. Serial No. 723,078.

To all whom it may concern:

Be it known that we, ALEXANDER H. DAVIDSON and SEVERUS SUNDELIUS, citizens of the United States, residing at Colma, in the county of San Mateo and State of California, have invented certain new and useful Improvements in Cremation-Furnaces, of which the following is a specification.

The hereinafter described invention relates to an improved furnace designed essentially for the cremation of bodies, the construction of which is such that the outlet stack or chimney employed in connection with such furnaces is dispensed with, whereby the products of combustion and generated gases are not discharged to the outside atmosphere.

The object of the invention is to remove the products of combustion and gases generated during the incineration of a body, without discharging the same directly into the atmosphere, and by doing so overcoming the objection now urged to the employment of cremation furnaces for the dead by reason of the claimed pollution of the surrounding atmosphere.

By the use of the hereinafter described constructed incinerating furnace, the same may be erected and the cremation of bodies carried on within thickly settled portions of a city without objection by reason of fouling the surrounding atmosphere, in fact, there being no exposed outlet stack for the products of combustion and the generated gases passing from the furnace during the process of cremation, there exists no exterior evidence of a crematory.

To comprehend the invention reference should be had to the accompanying drawings, wherein—

Figure 1 is a longitudinal sectional view of the furnace and its outlet connections for the products of combustion and generated gases. Fig. 2 is a horizontal sectional view of the furnace, illustrating the relative arrangement of the outlet flues and the return flue for conveying the gases from the condensing chamber to the combustion chamber of the furnace.

In the drawing, the numeral 1 is used to designate the crematory furnace constructed of suitable refractory material, within the combustion chamber 2 of which is arranged the transverse bars 3 held by the longitudinally disposed supports 3′ for holding the casket 4 with the body therein for cremation a slight distance above the floor 5 of the combustion chamber. The furnace is provided with a slidable gate 6 for the insertion of the casket into the combustion chamber, and in the floor 5 of the combustion chamber is formed a longitudinal channel 7, which is connected at the forward end of the furnace by a flue 8 within the combustion chamber 2, and communicates at the rear end of the furnace with an outlet flue 8′. At the rear end of the furnace and through the rear wall 9 thereof an opening 10 is formed for the insertion of a blast nozzle 11, which is extended into the combustion chamber 2 and directs therein and onto the body to be cremated a flame. This consuming flame is the product of liquid fuel, the hydrocarbon and air admixture being supplied to the blast nozzle by means of the controlled supply pipes 12 and 13.

From an outlet 14 in the rear wall of the furnace adjacent the bottom thereof and below the nozzle inlet leads a downwardly inclined outlet flue 14′, which flue connects with and in fact in the present case constitutes a portion of a suction conduit 15, of any suitable length, which communicates with the intake 15′ of a suction chamber 16 by means of a slightly reduced (although reduction is not essential) upwardly inclined flue 17. Within the conduit 15 for the products of combustion and generated gases discharged from the combustion chamber of the furnace 1, and preferably adjacent its connection with the flue 17 is introduced a liquid spraying device 18, for ejecting a liquid stream or streams onto the flowing body of the products of combustion and generated gases passing into the suction chamber 16 in order to cool and materially reduce the temperature of the same prior to introduction thereof into the said suction chamber. The liquid thus discharged onto the flowing body for the cooling of the same is collected within a small sump or well 19, which, by means of a contracted outlet 20 communicates with a sewer conduit 21, located below the concrete foundation 22 for the described features.

Within the suction chamber 16 is located any suitable form of a suction device 23, preferably in the form of a suction fan, which is driven by a motor 24, the suction device when in operation not only serving to draw the products of combustion and gen-

erated gases from within the combustion chamber of the furnace into the suction chamber 16, but at the same time insures sufficient draft to the furnace for the proper working thereof. The products of combustion and gases carried therewith are forced by the suction fan 23 from the outlet 25 of the suction chamber 16 into the condensing and settling chamber 26 through the conduit 27. The products of combustion and gases delivered into the said chamber 26 are washed and precipitated by means of a liquid shower discharged therein from the sprayer or sprinkler 28 extended within said chamber, preferably from the roof thereof, a liquid supply being admitted thereto through the valve controlled supply pipe 29 leading from any suitable source of supply. The liquid with the precipitated body of products of combustion and gases is conveyed from the cooling and settling chamber 26 into the sewer connection 21 through the outlet conduit or discharge pipe 29, forming a connection between said chamber and the sewer pipe or connection 21.

The outlet flue 8′ connects with the conduit 15 a slight distance beyond the furnace proper, and the flow into the said conduit from the flue 8′ is controlled by a swinging damper 9′. In the starting up of the furnace this damper 9′ is swung to open the flue 8′ and close the conduit 15 to one side thereof, so that the products of combustion during the initial heating of the furnace are drawn from the combustion chamber 2 into the conduit 15 through the outlet flue 8′. However, after the furnace is well under way, the damper 9′ is swung to close the flue 8′ at its point of intersection with the conduit 15 and to open the said conduit, so that the products of combustion and generated gases flow directly from the combustion chamber 2 of the furnace into the conduit 15. By thus closing the outlet flue 8′ and opening the conduit 15 for the direct escape of the products of combustion and generated gases, the consuming flame within the combustion chamber of the furnace is drawn over and beneath the body so as to completely envelop the same. Such of the generated gases, the same being in the main ammonia gases, as accumulate in the condensing chamber 26 and are not carried off into the outlet or discharge pipe 29 are, due to the pressure within said chamber, forced therefrom into the return flue 30 which connects with the combustion chamber of the furnace and by said furnace returned into the said chamber and re-subjected to the flame therein.

In operation of the furnace during the incineration of a body, the products of combustion and generated gases are withdrawn from the combustion chamber of the furnace into the suction chamber 16 through the conduit 15 by the rotation of the suction fan 23 and by said fan forced into the condensing chamber 26. During the course of travel toward the chamber 16, the flowing body of the hot products of combustion and generated heated gases are subjected to the action of a spray stream descending from the spray nozzle 18 thereon in order to cool the flow stream prior to the admission thereof into the chamber 16, from which chamber the same is forced into the cooling and precipitating chamber 26 through the connecting conduit 27. As forced into the chamber 26 the products of combustion and gases are moistened, cooled and precipitated by the stream of liquid discharged thereon from the sprayer 28, and carried off by the outflowing liquid passing through the outlet conduit 29 into the sewer conduit 21. The products of combustion and generated gases are thus disposed of without being brought into contact with the outside atmosphere.

By the above use of a crematory constructed as above set forth, a stackless furnace is produced, the products of which are removed therefrom and discharged into a sewer connection for delivery to a suitable place of deposit. The result is an efficient, inexpensive, compact, durable and sanitary furnace for the incineration of the dead, and one wherein the objections at present urged against the erection and maintenance of crematories within the limits of a municipality are disposed of.

The purpose of the chamber 26 with the spraying means therein is to give a final cooling and condensing to the products of combustion and gases delivered therein, so that the same discharge into the sewer conduit as a liquid stream in contradistinction to the outflowing vapor, such of the gases as fail to discharge into the sewer conduit being forced from the condensing chamber into the return flue 30 and discharged therefrom into the combustion chamber of the furnace.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is—

1. A crematory for the described purpose, the same comprising a furnace, of means within the combustion chamber thereof for sustaining the object for incineration, an outlet at the rear end of the furnace for the escape of the products of combustion and gases generated within the combustion chamber of the furnace, a suction conduit extended therefrom, a conduit extended from the forward end of said combustion chamber and communicating with said suction conduit intermediate its length, a damper controlling the passage of the products of combustion through either of said conduits, a suction chamber into which said suction conduit discharges, suction means

within the said chamber for withdrawing the products of combustion and generated gases from within the combustion chamber of the furnace, a condensing chamber situated beyond and communicating with the suction chamber for receiving the products of combustion and generated gases discharged therefrom, a sewer conduit, and connection between the said chamber and the sewer conduit for the discharge of the contents therein.

2. A crematory for the described purpose, the same comprising a furnace, of means within the combustion chamber thereof for sustaining the object for incineration, an outlet at the rear end of the furnace for the escape of the products of combustion and gases generated within the combustion chamber of the furnace, a suction conduit extended therefrom, a suction chamber into which said conduit discharges, a conduit extended from the forward end of said furnace and communicating with said suction conduit intermediate said outlet and said suction chamber, spraying means within the suction conduit in advance of the suction chamber for cooling the products of combustion and generated gases passing therethrough, a sump for receiving the liquid from said spraying means, a discharge outlet for the sump, suction means within the said chamber for withdrawing the products of combustion and generated gases from within the combustion chamber of the furnace and through the spraying means and thoroughly mixing the same, a condensing chamber situated beyond and communicating with the suction chamber for receiving the products of combustion and generated gases discharged therefrom, a sewer conduit, and connection between the said chamber and the sewer conduit for the discharge of the contents therein.

3. A crematory for the described purpose, the same comprising a furnace, of means within the combustion chamber thereof for sustaining the object for incineration, an outlet at the rear end of the furnace for the products of combustion and gases generated within the combustion chamber of the furnace, a suction conduit extended therefrom, a suction chamber into which said conduit discharges, spraying means within the suction conduit in advance of the suction chamber for cooling the products of combustion and generated gases passing therethrough, a conduit extended from the forward end of said furnace and communicating with said suction conduit in advance of said suction chamber, a damper controlling said conduits, a sump for receiving the liquid from said spraying means, rotary means within the suction chamber for withdrawing the products of combustion and generated gases from within the combustion chamber of the furnace, a condensing chamber situated beyond and communicating with the suction chamber for receiving the products of combustion and generated gases discharged therefrom, a sewer conduit, a return flue connection between the condensing chamber and the forward end of the combustion chamber of the furnace, and connection between the said sump and condensing chamber and the sewer conduit for the discharge of the contents therein.

4. A stackless crematory for the described purpose, the same comprising a furnace, of means within the combustion chamber thereof for sustaining the object for incineration, a downwardly inclined suction conduit extended from the rear end thereof for the withdrawal of the products of combustion and gases generated from within the combustion chamber of the furnace, a passage beneath the object sustaining means and communicating with the inlet of said downwardly inclined suction conduit, a suction chamber for receiving the products of combustion passing from said conduit, a conduit extended from the forward end of said furnace and communicating with said suction conduit in advance of said suction conduit, a damper for controlling said last mentioned conduit, means within the suction conduit for cooling the products passing therethrough, suction means within the suction chamber for drawing the products of combustion and generated gases from within the combustion chamber of the furnace and into the suction chamber through the suction conduit, a condensing chamber communicating with the suction chamber, means within the condensing chamber for applying liquid to the products discharged therein, a sewer conduit, and a discharge connection between said conduit and the condensing chamber.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALEXANDER H. DAVIDSON.
SEVERUS SUNDELIUS.

Witnesses:
HARRY A. TOTTEN,
D. B. RICHARDS.