(No Model.)

W. R. MACDONALD.

Heating Apparatus for Sanitary Purposes.

No. 239,177. **Patented March 22, 1881.**

Fig. 1.

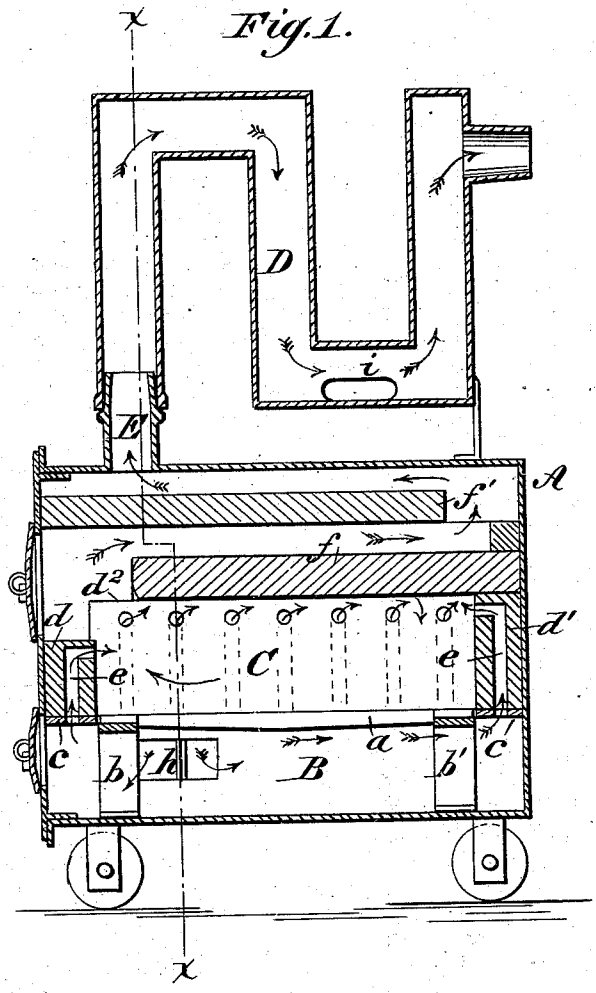


Fig. 2.

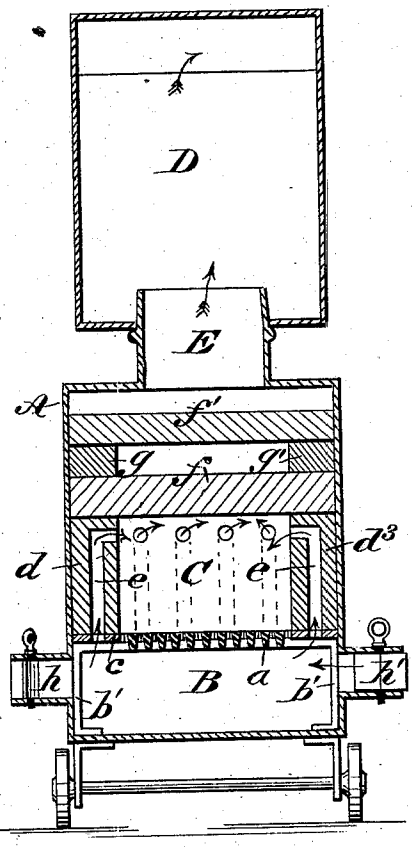


Fig. 3.

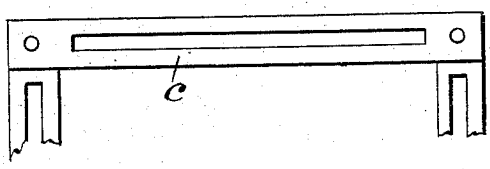
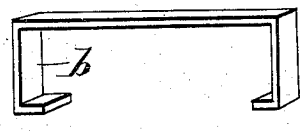


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM R. MACDONALD, OF ALLEGHENY CITY, PENNSYLVANIA.

HEATING APPARATUS FOR SANITARY PURPOSES.

SPECIFICATION forming part of Letters Patent No. 239,177, dated March 22, 1881.

Application filed December 14, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. MACDONALD, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Heating Apparatus for Sanitary Purposes, of which the following is a specification.

The invention relates to apparatus for heating, ventilating, and preventing the spread of communicable diseases.

The object of this invention is to supply at small cost an effective apparatus of simple construction for the sanitary uses of heating, ventilation, and disinfection of buildings—public and private—sewers, drains, and vaults, isolated, sick, or other apartments, water-closets and mines, such apparatus to be used either solely as a heater or as a heater, disinfector, and ventilator, or for outdoor use as a disinfecting-ventilator alone, the same supplying heat as required, either by convection or direct radiation, the same having perfect combustion of fuel, and using the same units of fuel to heat, to disinfect, and to ventilate, drawing from foul and vitiated sources the air-supply for perfect combustion—viz., two hundred and ninety-five cubic feet of air for each pound of coal consumed—and also, at the same time, utilizing the heat-attraction of the interior surfaces of the apparatus for ventilation and disinfection, drawing away and passing through and over fire and impinging against highly-heated surfaces the poisonous atmosphere of ward-rooms, disinfecting and ventilating the same, thereby preventing the spread of disease. It is also an object to furnish a hot-blast disinfecting fire-chamber with dust-flues and hot-blast ducts in combination, utilizing the entering cold air to cool and preserve the grate.

In the drawings, Figure 1 is a central longitudinal vertical section of my improved heating, disinfecting, and ventilating apparatus. Fig. 2 is a vertical transverse section of the same on line $x\ x$, Fig. 1. Fig. 3 shows, in plan view, a convenient form of bearing or support bar for the linings; and Fig. 4 is a perspective view of one of the supporting-jacks for bearing-bars.

The casing A, herein shown as oblong in shape and made of sheet-metal plates suitably riveted together and mounted upon wheels, as shown, is divided into two compartments—viz., the ash pit or receptacle B and heating or disinfecting furnace C, the dividing medium for the said compartments being the grate-bar *a*, of any ordinary construction, supported at its ends, at suitable height, upon jacks or supports *b b'*, one at each end of the ash-pit B.

Extending around the compartment C, and resting upon supports *b b'*, is a hollow bearing-bar, *c*, to support the linings *d d' d² d³*, provided with suitable supply-ducts or ventilating-passages, *e*, communicating with the ash-pit B, for the passage of air from the said ash-pit into the fire-chamber C.

At the top of the fire-chamber, suitably supported upon the linings of the apparatus, are two deflectors, *f f'*, which overreach one another, the said deflectors being separated by fire-brick linings *g g'* at their sides These deflectors *f f'* serve to deflect or retard the flame in its upward passage, and hold the gases of combustion until a perfect union is effected with the entering oxygen contained in the vitiated air, thereby producing perfect combustion of smoke and gases and insuring disinfection of the vitiated air before it is allowed to escape into the outer atmosphere. This combustion of products greatly assists the saving of fuel.

At suitable places in the ash-pit B are made openings or inlet-ducts *h h'*, which are to be connected, by a pipe or otherwise, with the apartment to be disinfected and ventilated. These exhaust-ducts, through the medium of suction or partial vacuum caused by the fire-chamber C and the heat-attraction of the interior heated surfaces, aided by atmospheric pressure, take the vitiated air from the said apartments, from whence it is carried into the ash-pit, where it is first utilized to cool the grate-bars; then, carrying with it all dust, it passes through the ventilated bearing-bar *c* into the supply or hot-blast ducts *e* of the linings *d d' d² d³*, where it is heated in its passage and discharged into the fire-chamber C at high temperature, where it undergoes disinfection of all organic matter, the same operation insuring ventilation as well as disinfection.

In all cases the places to be disinfected and ventilated should be provided with fresh-air

inlets to supply the vacuum caused by the exhaust of the apparatus, to dilute the foul atmosphere, and to supply air for combustion.

This apparatus can be, and may, when desirable, be, used as a cremating-furnace. The object to be cremated should preferably be placed on the top of the lower deflector.

There are various ways of admitting air to the fire-pot to facilitate combustion; but the one herein described is preferable.

As herein shown, I have provided the apparatus with a radiator, D, in form shaped like an inverted letter S, arranged at the top, and connected with the fire-chamber C by means of a smoke-pipe, E, through which the now purified air passes, to be herein utilized as a heating medium, or to be discharged into the outer atmosphere. The radiator is provided with a clean-out hole, *i*. This radiator D may, however, be dispensed with and an ordinary smoke-pipe substituted.

The supply-ducts *e* in linings *d d' d² d³* allow expansion and contraction of the linings, thus adding to the durability of the same, the said ducts *e* also forming numerous dust flues impossible to clog with the dust of the ash-pit, grate, or fire-chamber, and will allow of solid filling in behind them in fire-places, and in boiler or other furnaces, where they may be adapted for ventilation, disinfection, and sanitary purposes.

It will be seen that with my improved linings the air passing through the interior is nearer the fire than if solid linings were used, where the air is admitted behind them, and consequently heats much quicker, and, besides ventilating the linings themselves, cause great expansion of air admitted, so that all the sensitive surfaces of the heater and radiator are brought in direct contact, not with the flame, but with the air and gases in a state of high temperature.

The apparatus will be provided with furnace and ash-pit doors of any usual construction, or may be provided with a removable front, to permit repair or removal and substitution of linings.

The fire-box is peculiarly adapted for combustion of free-burning coals, being gas-producing and gas-consuming, the hot-blast ducts in linings supplying the heated air for top and side combustion.

The apparatus may be drawn from its air-chamber to facilitate whitewashing or cleaning the same.

When operating as a disinfecting-ventilator alone in outdoor service the exhaust-duct of the apparatus may be connected with an isolated apartment at the window, or in any other convenient way.

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

In a heating apparatus for sanitary purposes, the casing A, divided by the grate-bars *a* into an ash-pit, B, and combustion-chamber C, in combination with the linings *d d' d² d³*, supported on bearing-bar *c*, and having passages *e*, and the overlapping deflectors *f f'*, all arranged substantially as shown and described.

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Witnesses:
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