No. 683,618. Patented Oct. 1, 1901.

A. NOTEMAN.

GAS RADIATOR.

(Application filed Jan. 14, 1901.)

(No Model.)

Fig. 1.

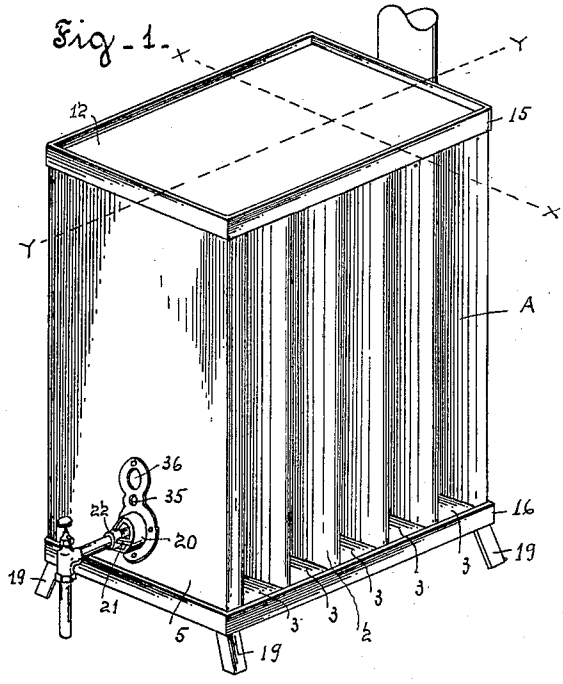


Fig. 2.

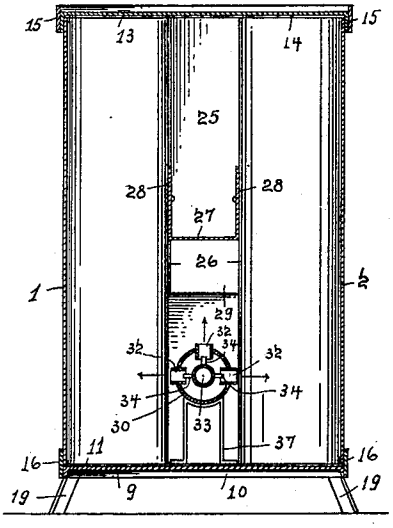


Fig. 3.

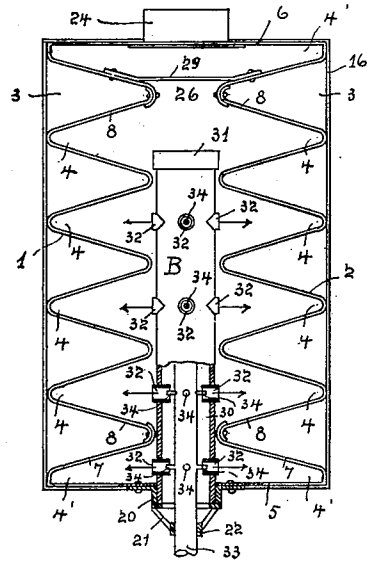
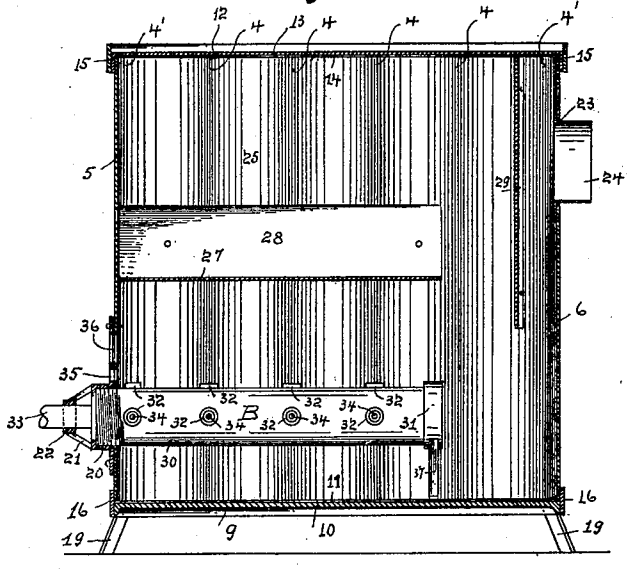


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALONZO NOTEMAN, OF TOLEDO, OHIO.

GAS-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 683,618, dated October 1, 1901.

Application filed January 14, 1901. Serial No. 43,165. (No model.)

To all whom it may concern:

Be it known that I, ALONZO NOTEMAN, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Gas-Radiators, of which the following is a specification.

My invention relates to a gas-radiator, and has for its object to provide a heater of the kind of inexpensive and novel construction adapted to increase the heating and radiating surfaces to the maximum; furthermore, to provide effective means within the radiator to direct the heat against the heating-surface; furthermore, to provide a gas-burner for the radiator adapted to equally distribute the heat to the heating-surface, and, finally, to provide a gas-burning radiator of high efficiency as to combustion and heat radiation.

In the drawings, Figure 1 is an isometric view of a radiator constructed in accordance with my invention. Fig. 2 is a cross-section of the same on line *x x* of Fig. 1. Fig. 3 is a plan view of the radiator with the top and diaphragm removed and the burner with portion of top broken away and partly in section, and Fig. 4 is a longitudinal vertical section through the radiator on line *y y* of Fig. 1.

The objects of my invention are accomplished by providing a shell, preferably of sheet metal, having deeply-sinuated sides forming at regular intervals narrow contractions of the inner chamber alternating with broad widenings thereof, with a U-shaped horizontally-disposed diaphragm secured to the sides and bridging a plurality of the contractions from the front to the rear of the shell, a vertical diaphragm partly dividing the chamber from the top downward at the rear contraction, a manifold burner connected with a gas-supply and the outer air extended into the chamber beneath and for the length of the horizontal diaphragm and adapted to inject commingled gas and air oppositely into the recesses of the widenings, and a flue opening from the upper rear chamber formed by the vertical diaphragm.

A preferred form of construction of my invention is illustrated in the drawings, in which the shell A comprises the reversely-sinuated sides 1 and 2, forming the reversely-disposed outer recesses 3 and the inner recesses 4, the end plates 5 and 6, having curved end portions 7, overlapping and riveted or otherwise suitably secured to the ends 8 of the sides, forming the half-recesses 4' at the ends, the base 9, comprising a metal plate 10, having a sheet of asbestos 11 superimposed thereon, a top 12, comprising a flanged metal plate 13, having an asbestos lining 14, and rims 15 and 16, secured to the top and bottom, respectively, and to the sides and ends. The shell thus constructed is provided with suitable supports 19, secured to the base 9.

Upon the face of the end plate 5 and near the base of the shell there is secured concentric to an orifice in the plate a collar 20 for supporting a burner, the collar being internally threaded and provided with spider-arms 21, formed integral therewith and projecting therefrom in a converging direction and merging into a boss 22, having a reduced central bore, and to the rear end of plate 6 is also secured a collar 24, concentric with an opening 23 near the top of the plate, for attaching a flue.

Preferably the sinuations of the sides contract the inner chamber 25 at intervals into narrow necks 26 of just sufficient width to admit a burner lengthwise between them, as shown in Fig. 3, and below the medium height of the chamber is provided a horizontally-disposed diaphragm 27 of a width and length to bridge a plurality of the necks 26 from the front toward the rear, having upturned vertical sides 28 extending above the medium line, by which the diaphragm is secured to the sides at the necks 26 by any suitable means, the purpose and effect of the diaphragm being to direct and confine the upward heated-air currents to the adjacent recesses 4. At the rear neck 26 of the chamber 25 there is also provided a vertical diaphragm 29, extending from the top to a point below the medium line, closing the neck for the distance of its length and dividing the upper portion of the chamber, the purpose of the diaphragm being to direct the waste products of combustion downward through the rear recesses 4 and upward to the flue to further absorb and radiate the heat remaining therein.

To heat the radiator, the manifold burner B is provided, comprising the air-conduit 30,

open at its outer end and adapted for threaded engagement with the collar 20 and of a length to extend it through a plurality of the necks 26, the rear end being closed by a cap 31. Centrally opposite each recess 4 and the front half-recesses 4′ conduit 30 is provided with oppositely-projecting mixer-tubes 32, and centrally through the length of the air-conduit to near its rear end is a gas-conduit 33 of reduced diameter, which opposite each mixer is provided with a gas-nipple 34 in concentric alinement therewith and just entering the same, adapted, when the conduit 33 is filled with gas under pressure, to inject a jet of gas through the mixer, thereby inducing a current of air through the mixer and projecting commingled air and gas against the walls of the opposite recesses 4. Conduit 33 extends through the boss 22, whereby it is supported concentrically within the air-conduit 30 to the gas-supply. When the gas is turned on from the supply, it may be ignited through the small aperture 35 in the front plate 5, provided for the purpose. For radiators of a large size vertical nipple 34 and mixers 32 may be added to the burner.

At a suitable position in plate 5 is provided a mica window 36 for observing the fire.

37 is a support for the burner.

By the construction shown and described it is manifest that a large area of heating and radiating surface is provided, that highly efficient combustion is attained, and that the heat produced thereby is equably distributed to the heating and radiating surfaces under conditions to produce the greatest radiation.

Having thus fully described my invention, what I claim is—

1. In a gas-burning radiator, a shell, having its sides reversely sinuated, forming, at regular intervals, alternate narrow contractions and broad widenings of the inner chamber throughout its length, a diaphragm having vertically-upturned sides, horizontally disposed between and secured to the sides of the shell, and bridging a plurality of the contractions of the chamber from the front end toward the rear, a vertical diaphragm closing the rear contraction from the top downward below the medium line, a manifold burner, connected with a gas-supply and the outer air, extended into the chamber from the front, beneath and for the length of the horizontal diaphragm, and adapted to project commingled gas and air oppositely into the recesses of the widenings, and a flue, opening from the upper rear chamber formed by the vertical diaphragm.

2. In a gas-burning radiator, the combination of a shell A, comprising reversely-sinuated sides 1 and 2, ends 5 and 6, having curved portions 7 secured to the curved ends 8 of the sides, a base 9, a top 12, and rims 15 and 16 respectively secured to the bottom and top, and the ends and sides, a diaphragm 27 secured to the sides and extending horizontally through the chamber thus formed, from the front toward the rear, and bridging a plurality of necks 26 formed therein by the sides, a vertical diaphragm 29 secured to the sides and for the most part closing the rear neck 26 from the top downward, and a flue 24 opening from the top of the rear end.

3. In a gas-burning radiator, the combination of a shell A, comprising reversely-sinuated sides 1 and 2, ends 5 and 6, having curved portions 7 secured to the curved ends 8 of the sides, a base 9, a top 12, and rims 15 and 16 respectively secured to the bottom and top, and the ends and sides, a diaphragm 27 secured to the sides and extending horizontally through the chamber thus formed, from the front toward the rear, and bridging a plurality of necks 26 formed therein by the sides, a vertical diaphragm 29 secured to the sides and for the most part closing the rear neck 26 from the top downward, a flue 24 opening from the top of the rear end, a manifold burner B extended into the chamber of the shell A, from the front toward the rear, beneath the diaphragm 27, comprising an air-conduit 30, open at the front and closed at the rear end, provided with mixers 32 projecting oppositely into the recesses of the sides, a gas-conduit 33 within the air-conduit supported concentric therewith, having gas-nipples 34 in alinement with and concentric to the mixers, and a suitable connection to a gas-supply, substantially as shown and described.

In witness whereof I have hereunto set my hand this 10th day of January, A. D. 1901.

ALONZO NOTEMAN.

Witnesses:

IRVING E. MACOMBER,

HERMAN H. MARTIN.