(No Model.) 2 Sheets—Sheet 1.

H. L. GOODWIN.

RADIATOR.

No. 599,897. Patented Mar. 1, 1898.

Fig. 1.

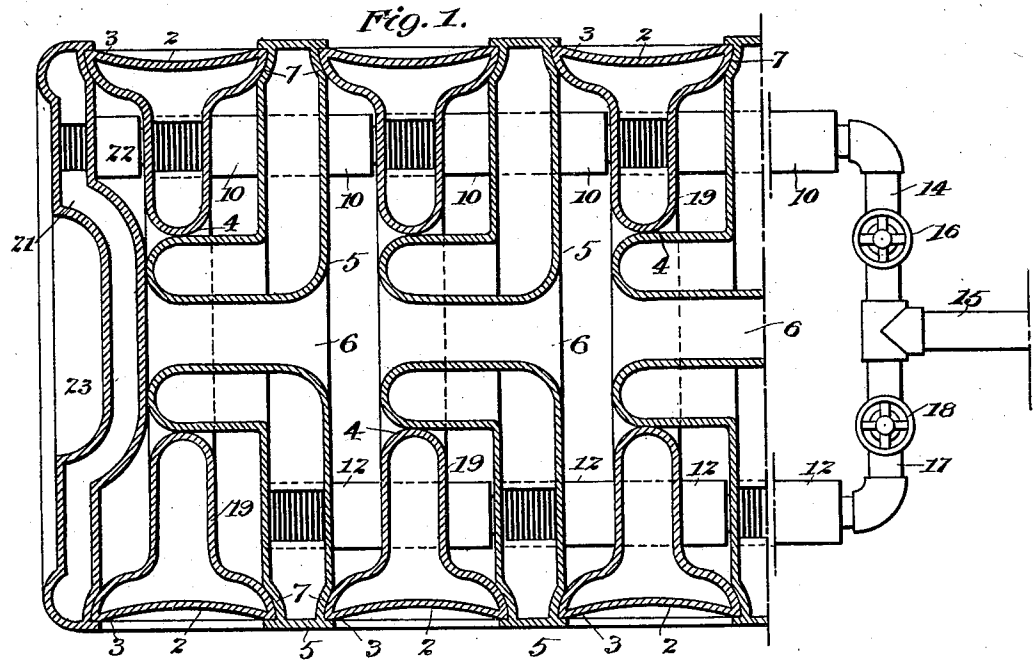
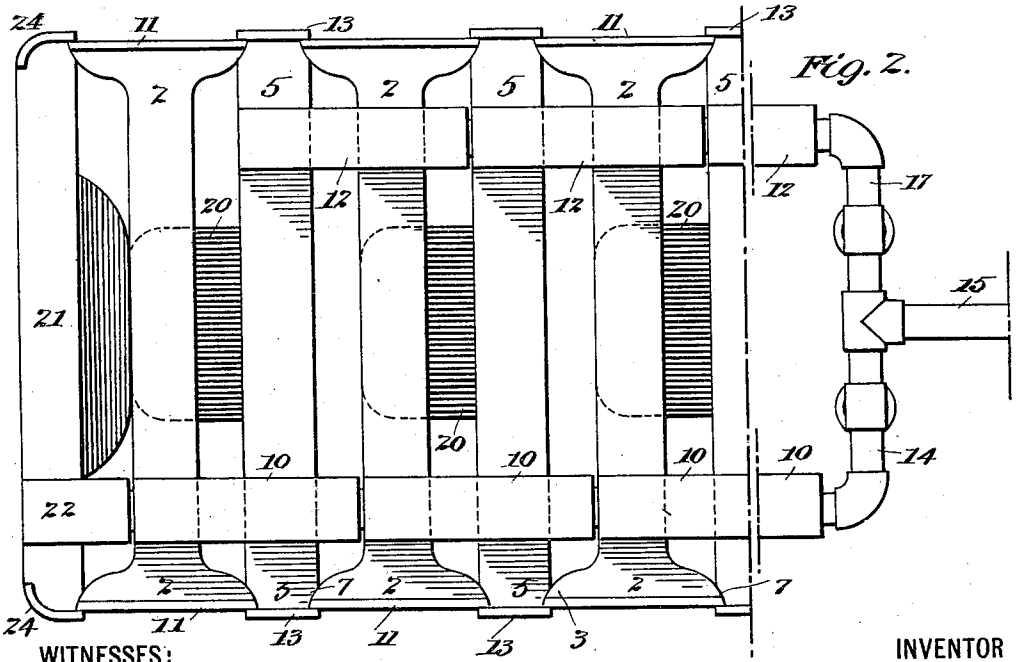


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

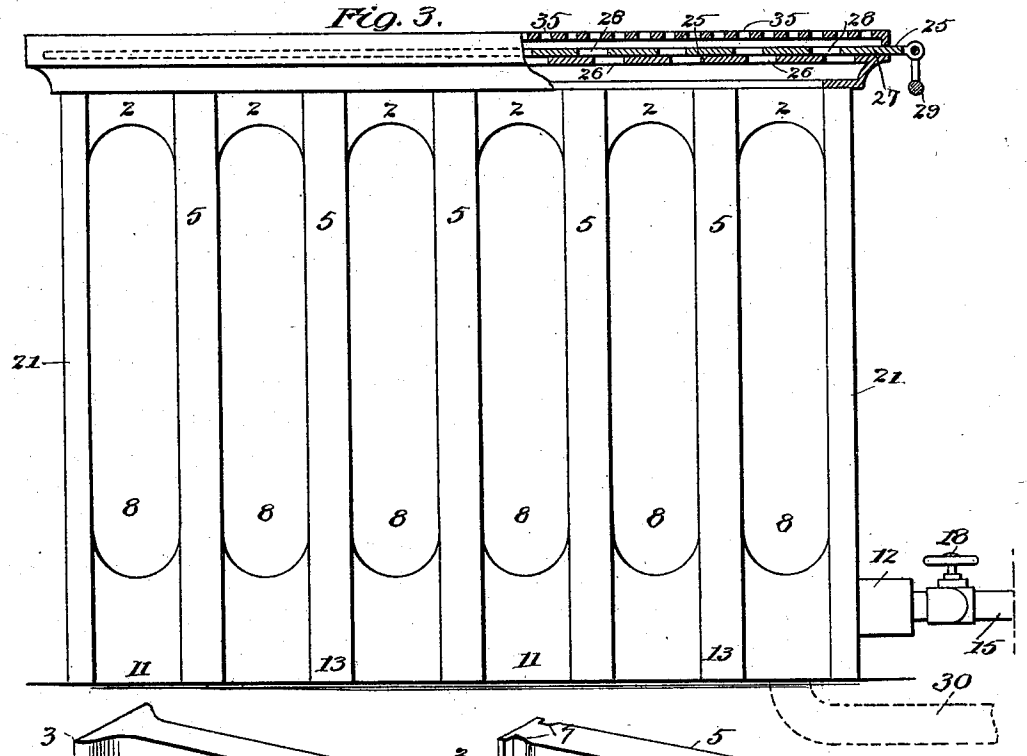


Fig. 4.

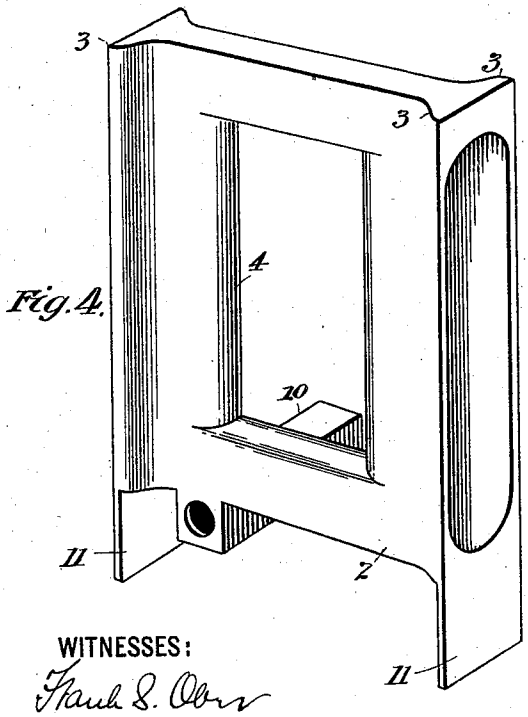
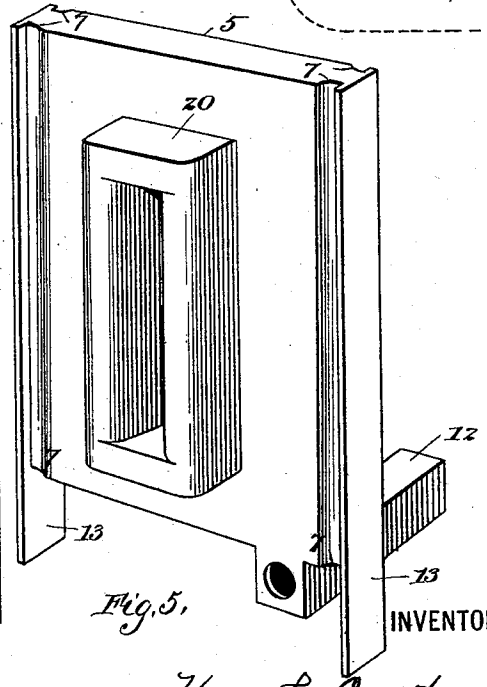


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY L. GOODWIN, OF NEW YORK, N. Y.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 599,897, dated March 1, 1898.

Application filed January 7, 1897. Serial No. 618,264. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. GOODWIN, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Radiators, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which the invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to apparatus for heating the air of a room or the like and is adapted for use more especially with steam as a heating agent, though it is not necessarily restricted to use with steam.

The invention consists in the various novel and peculiar arrangements and combinations of the several parts of the apparatus, all as herein fully described and then pointed out in the claims.

I have illustrated a type of my invention in the accompanying drawings, wherein—

Figure 1 is a view of a horizontal section of my improved apparatus. Fig. 2 is an under side view of the same. Fig. 3 is a side elevation with one end of the upper portion of the apparatus broken away in order to show the construction of the adjustable register and the grating above it. This view is on a reduced scale. Figs. 4 and 5 are perspective views of one of the inner and one of the outer sets of radiating-sections, respectively, shown as detached.

Referring to the drawings, in which like numbers of reference indicate like parts throughout, 2 indicates a hollow rectangular-shaped body or metallic casing, the opposite sides of which are flared or enlarged at 3, and each one is formed with a central opening 4. 5 5 indicates another set of hollow bodies or metallic sections, which are formed with a central opening 6 and are provided upon the inner sides, near the side edges thereof, with depressions 7 for the reception of the flaring ends 3 of the adjacent sections 2. When these sections are placed together side by side, they present a practically unbroken side wall, in which the greater part of the surface thereof is constituted by the sections 2 2, as shown in Fig. 3. In the drawings I have shown the sections 2 as formed with depressed or concave panels 8 at the ends, which, alternating with the straight flat surfaces 9 of the sections 5, will present a somewhat ornamental appearance.

Each of the sections 2 2 is provided with a coupling extension 10, which projects horizontally from the base, the section itself being elevated by the legs 11 11, so as to provide a free space beneath it. In a similar way each of the sections 5 is provided with a coupling extension 12, and these sections are likewise provided with legs 13. The sections are assembled in alternate order and are placed with their broad sides together. The coupling extension 10 of one of the sections 2 projects under the next section 5 and is connected with the section 2 next beyond it, and so on through the set, so that by means of the couplings 10 all of the set of sections 2 2 are placed in communication with each other. The end section 2 of the set is connected by means of its coupling 10 with the branch 14 of the steam-supply pipe 15, and in this branch is located a valve 16. In the same way all of the other set of sections 5 5 are placed in communication with each other by means of their couplings 12, and the end one of the set is by means of its coupling connected with the branch pipe 17 of the steam-supply 15, and a valve 18 is located in the branch pipe 17 for admitting the steam or cutting it off at will.

The flaring ends 3 3 of the sections 2 serve as spacing-pieces, so that the main portions of the adjacent sections are held away from each other, so as to constitute a free air-space 19 19, which extends from the space below the section upwardly to the tops thereof, where they communicate with the outer air. The central openings 6 6 of the sections 5 also permit the air to circulate around the coils. In order to increase the radiating-surface of the set of coils 5, I form an enlargement or extension 20 around the central opening 6 thereof and make it sufficiently long to pass through the opening 4 of the next adjacent section 2, and in this way the sections are made to overlap each other.

At each end of the group of sections is arranged a large flat hollow plate-like body 21, which, in fact, constitutes one of the set of

outer sections 2 of the group. This section forms an end wall for the apparatus, and the one at the end where the steam-pipes are located is connected with the branch 14 of the steam-supply, while the one at the remote end thereof is connected with the adjacent section 2 by means of a coupling extension 22, projecting from the base thereof, so that each of these hollow end plates is in communication with the set of sections 2 2, and, taken together, they constitute what I term the "outer" set of the group of sections of which the apparatus is composed. These end sections 21 may also be made ornamental on the exterior, as indicated at 23 in Fig. 1, and they are each elevated upon legs 24, so as to provide an air-space beneath it. It will now be understood that the air passing in under the end sections 21 circulates through the interspaces of the sections and moves upwardly among them, and is thence delivered from above the group as heated air in consequence of its passage over the heated surfaces of the radiating sections or coils.

The discharge of the heated air from above the sections takes place through an adjustable register consisting of a fixed horizontal plate 25, formed with openings 26, and a sliding plate 27, formed with openings 28. This sliding register-plate is provided at one end with a handle 29 for manipulating it, and when this plate is moved into such position that its openings register with those in the fixed plate the heated air can pass freely through the register. By moving the adjustable plate so as to contract the openings in the register the quantity of heated air delivered therefrom may be regulated, and by placing the openings out of registration with each other the heat may be shut off completely.

In using the apparatus when it is desired to obtain a moderate heat the valve 16 of the branch steam-pipe 14 is closed, thereby keeping the steam from the set of outer sections 2 2 and 21 21, so that practically all four sides of the apparatus are kept comparatively cool, while the main portions of the interior surfaces of the sections may be maintained at a high temperature by admitting the steam through branch pipe 17 to all of the set of interior sections 5 5. A still more moderate heat may be obtained by closing the register at the top of the apparatus. Under this condition a slight direct radiation of heat is given off from the small areas at the sides of the sections 5, while the heat radiated from the main portions of these sections will heat the adjacent sections 2 and cause them to give off some little heat. Likewise the two end plates 21 will also emit some heat indirectly.

When the outer set of casings or sections are to be used alone as radiating bodies, the heating agent is supplied to the exterior instead of the interior set of sections by closing the valve 18 and opening the valve 16 in the branch pipe 14. By opening both valves 16 and 18 the heating agent may be supplied to all of the casings or sections of both the inner and outer sets, and each one may thus be used as a radiator. Thus it is obvious that either the inner or the outer set of casings or sections may be used alone at will or that both sets may be used together, as desired. When the heating agent is admitted to the inner set of sections or casings alone, the outer set being comparatively cool, practically the entire outer sides of the apparatus are maintained in the same cool condition, for there is a very insignificant portion of the ends of the sections 5 exposed at such sides. In fact, in some instances I bring the adjacent flaring ends 3 3 of the outer section together, so that no portion of the sides of the sections 5 are exposed at the sides of the apparatus at all.

Where it is desired to introduce cold air from outside of the room or compartment in which the apparatus is located, this may be done by use of a cold-air pipe 30, which runs from the base of the interior of the group of sections to a suitable distant point, as indicated in Fig. 3.

Above the adjustable register located in the upper part of the apparatus I arrange a fixed grating 35 35, which in addition to protecting the register makes the apparatus neater in appearance.

I do not wish to limit myself to the precise form of apparatus herein set forth, as various modifications may be made in the same without departing from the spirit of the invention.

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

1. In a heater, the combination of a group of radiator-sections comprising an interior and an exterior set independent of each other, pipe connections for supplying the heating agent or steam to either or both of said sets at will, the said exterior sections being arranged to constitute an exterior hollow wall substantially incasing the interior set, substantially as and for the purpose set forth.

2. In a heater, the combination of a group of radiator-sections comprising an interior and an exterior set independent of each other, pipe connections for supplying the heating agent or steam to either or both of said sets at will, the said interior set of sections being arranged with free interspaces for the passage of the outer air, the said exterior set of sections of said group being arranged to constitute an exterior hollow wall substantially incasing the said interior set, whereby upon shutting off the supply of heating agent to said exterior sections the outer air may be drawn through said interspaces over the interior sections and thereby heated and delivered from the end of the same, substantially as and for the purpose set forth.

3. In a heater, the combination of a group of radiator-sections comprising an interior and an exterior set independent of each other, pipe connections for supplying the heating

agent or steam to either or both of said sets at will, the said interior set of sections being arranged with free interspaces for the passage of the outer air, the said exterior set of sections of said group being arranged to constitute an exterior hollow wall substantially incasing the said interior set, whereby upon shutting off the supply of heating agent to said exterior sections the outer air may be drawn through said interspaces over the interior sections and thereby heated and delivered from the end of the same, and an adjustable register mounted across one end of said group of sections, substantially as and for the purpose set forth.

4. In a heater, the combination of a radiator-section provided with a central opening and a second radiator-section also formed with a central opening and provided with a hollow extension extending around said opening and projecting within the opening of said first-mentioned section and overlapping the same, said openings adapted to permit the circulation of air through the same, substantially as and for the purpose set forth.

5. In a heater, a set of suitably-spaced radiator-sections 5, 5, combined with a set of radiator-sections 2, 2, alternating therewith, the said latter sections being provided with hollow ribs or extensions 3, 3, at the side edges thereof which ribs project outwardly for engaging the adjacent sections 5, 5, and spacing said respective sections from each other, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 4th day of January, 1897, in the presence of the two subscribing witnesses.

HENRY L. GOODWIN.

Witnesses:
WILLIS FOWLER,
A. M. HAYES.