W. F. ROSS.

Heating-Stove.

No. 169,298. Patented Oct. 26, 1875.

Fig 1

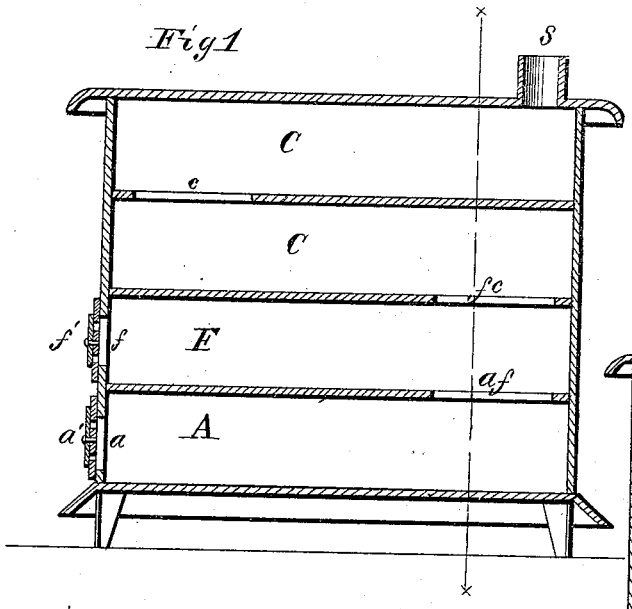



Fig 2

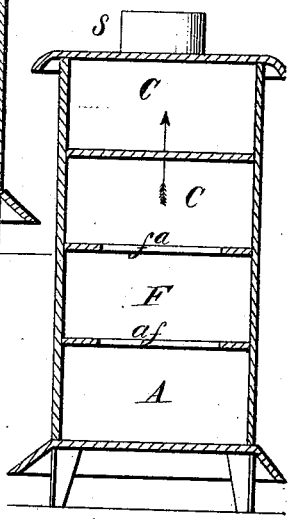



Fig 5

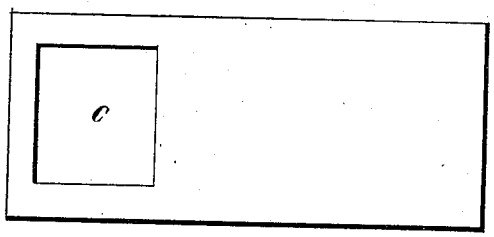



Fig 3

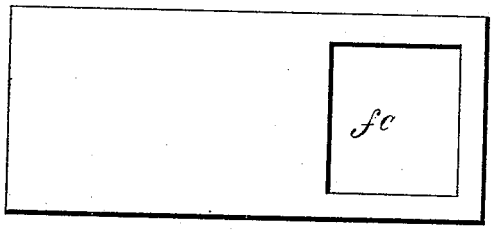



Fig 4

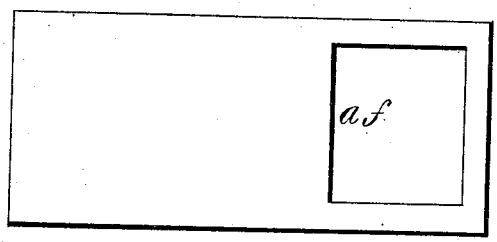
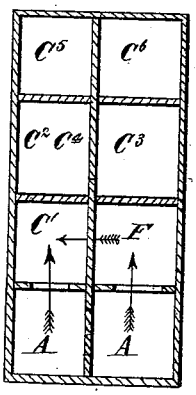



Fig 6

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# UNITED STATES PATENT OFFICE.

WILLIAM F. ROSS, OF DAVENPORT, IOWA.

## IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **169,298**, dated October 26, 1875; application filed August 21, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM FRAZIER ROSS, of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Heating-Stoves; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The present invention relates to that class of stoves and heaters wherein it is designed to use bituminous coal as fuel; and the object is to effect such an improvement in this class of devices as will cause the combustion of the fuel to be almost perfect; and to this end it consists, first, in a fire-chamber with a bottom imperforate except at the rear, and having a feed-door in front and at its open rear an escape-passage for the outflow of the products of combustion; second, in the combination of the fire-chamber aforesaid with a chamber beneath usually of similar shape and size, and so adapted and arranged in connection therewith that the refuse, clinkers, &c., from said fire-chamber may be pushed into it as occasion may require, and so that a hot-air draft may be fed to the products of combustion as they escape from said fire-chamber; third, in the combination of a fuel-combustion chamber open at the rear, and having an air-draft passage at its rear with a series of zigzag escape-flues; fourth, in the combination of the fire-chamber having a dampered door with the chamber below having a dampered door, whereby the draft can be effectually regulated, and at the same time effectual means of ventilation is afforded in the apartment where the heater is placed, all as will now be particularly and in detail set out.

Figure 1 is a longitudinal section of a stove embodying my invention. Fig. 2 is a cross-section of the same.

A is the ash-pit and also an air-duct, with door *a* and register *a'*. F is the fuel-chamber, with door *f* and register *f'*. C C are chambers for combustion of gas and smoke, and also for draft from the fire.

Figs. 3, 4, and 5 are plans of the plates between C and C, F and C, and A and F, respectively. *c*, *f c*, and *a f* are apertures through which they communicate. *s* is the smoke-pipe.

The fuel-chamber F has a close bottom, except the opening *a f* at the rear, where the solid products of combustion, when pushed back, fall into the ash-pit A, thus avoiding separation of the ashes from the clinker, and consequent accumulation and massing of clinker in the fuel-chamber. Fresh fuel is introduced through the door *f* after pushing back the incandescent fuel and ashes and clinker in F, so that the volume of gas and smoke from the fresh fuel shall pass through or immediately over the fire and meet the volume of air from A at the rear of F, and be gradually consumed as the air and gases mix in passing through apertures *f c* and *c* and the combustion-chambers C C. The air-passage *a' a* A *a f* may be separate from the ash-pit, and may be over the fuel-chamber F or at one side of it, or at one side of the ash-pit, or otherwise, so that the air be introduced in a volume where the smoke leaves the fire to be used in the gradual combustion of the gas and smoke in their outward passage.

The zigzag duct C *c* C may be continued by other similar chambers as far as necessary to complete the combustion of the smoke and gas, or to retain the heat.

Fig. 6 is a cross-section of a stove made by me, and now in use, in which the ventilating-duct is at one side of the ash-pit, and in which there are five combustion-chambers.

By my device as thus arranged, constructed, and operated the fire can be made self-feeding, as it were—that is, in such a way as to produce a gradual and steady combustion of the fresh fuel next to the fire, and in consequence a very regular and uniform heat. The air for combustion is also prevented from passing through the incandescent fuel to the fresh fuel, by which means it is not deprived of its oxygen before it reaches the gas and smoke, and thus the process of perfect and uniform combustion is more readily held in control and made sure. The air-draft into the fire-chamber may also be, in a measure, heated before it reaches the point of combustion. The current of air passing through the chamber beneath the fire-chamber becomes very highly heated by contact and

by radiation, and when it commingles in the rear opening and flue with the escaping products of combustion it so combines and unites therewith as to reintensate the combustion of the unconsumed elements, and thereby more thoroughly and effectually consumes the same and exhausts all the heat therefrom. The system of zigzag passages in the stove affords ample opportunity for the radiation of all the heat evolved from the escaping and constantly-consuming products of combustion, and enables all, or nearly all, the heat to be utilized.

The manipulation of my device in feeding and in cleaning it is very simple. The details of this need not now be more particularly dwelt upon, as they will, for all practical purposes, be sufficiently obvious. The utility of the means adapted for ventilating the apartment—to wit, the dampered apertures in the doors of the hot-air chamber and in the ash-pit or chamber beneath said fire-chamber—is a matter of very great consequence, and most excellent in practical operation.

I claim—

1. The fuel-chamber F, having a bottom imperforate except at the rear opening *a f*, leading to the ash-pit, and a draft-escape above the same, substantially as and for the purposes set forth.

2. The combination of the fuel-chamber F, having aperture *a f* at its rear, with the ash-pit A beneath, whereby a heated air-draft can be fed upon the products of combustion escaping from said fire-chamber upwardly from its open rear, substantially as and for the purposes set forth.

3. The combination, with the zigzag ducts *f f c*, C *c* C, of the fuel-chamber F and register-ducts *a a'*, chamber A, and openings *a f*, substantially as and for the purposes set forth.

4. In combination with the close fuel-chamber F, having imperforate bottom, and having an escape and discharge opening at its rear, as described, and the door *f f'* in front, the opening *a f*, and ash-chamber A, having registered doors *a a'*, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WM. F. ROSS.

Witnesses:
L. A. DAVIS,
R. B. HAHNAN.