

(No Model.)

E. R. WESTON.  
SMOKE BURNING STOVE.

No. 420,503.

Patented Feb. 4, 1890.

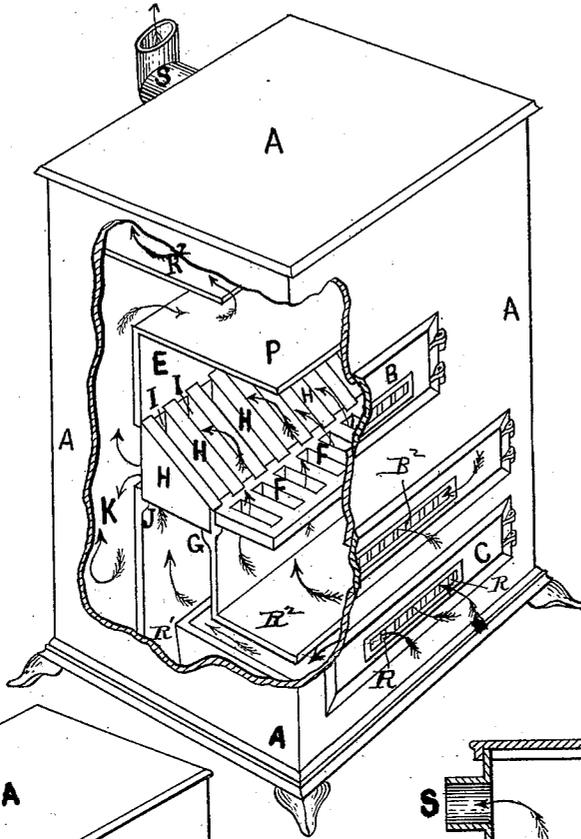


FIG. 1.

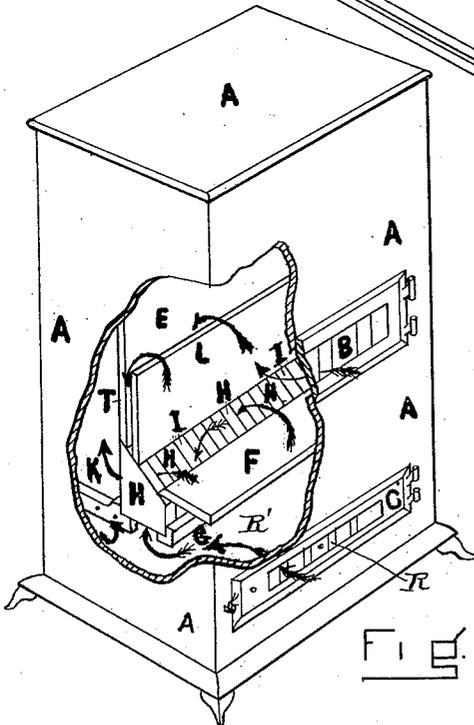


FIG. 2.

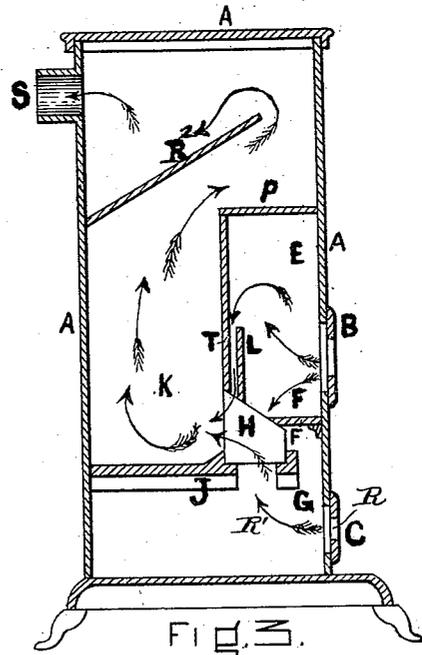


FIG. 3.

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# UNITED STATES PATENT OFFICE.

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## SMOKE-BURNING STOVE.

SPECIFICATION forming part of Letters Patent No. 420,503, dated February 4, 1890.

Application filed February 11, 1887. Serial No. 227,349. (No model.)

*To all whom it may concern:*

Be it known that I, EMILE R. WESTON, of Bangor, in the county of Penobscot and State of Maine, have invented an Improvement in Smoke-Burning Stoves, of which the following is a specification.

The object of my invention is to provide a stove for burning bituminous or other soft coal without smoke or smell; and it consists in the construction, combination, and arrangement of a series of inclined refractory fuel-supports, whereby the flame from the fuel placed on the grate passes between the fuel-supports and enters the combustion-chamber in a series of individual jets, whereby the smoke or carbon and all gases are perfectly consumed or burned, as hereinafter more fully described, and specifically set forth in the claims.

Figure 1 represents a stove in perspective, parts being broken away to show a portion of the interior embodying my invention. Fig. 2 represents a stove in perspective, parts being broken away to show a portion of the interior embodying a modification of my invention. Fig. 3 represents a vertical section of Fig. 2.

A represents the exterior or outer walls, of any suitable design for a stove or furnace adapted for heating or cooking purposes, which is provided with a feed-door B, ash-door C, and sliding or adjustable air-inlets or other air-passages desired, as shown at R, which lead into an air-chamber R' beneath the combustion-chamber or fire-box. This chamber is formed by the walls of the base portion of the stove in conjunction with a suitable partition or partitions, which latter may be furnished by a supplemental plate R<sup>2</sup> or by making the fuel-support F imperforate, as shown in Fig. 2, the incoming air in either construction being caused to pass below and upward behind the grate or fuel-receptacle to assist in the complete combustion of the gaseous products from said fuel. Where the supplemental plate R<sup>2</sup> is employed, a chamber will be formed below the grate and above or in front of chamber R', Fig. 1, through which air may be admitted by draft-openings B<sup>2</sup> to the under side of the grate.

E represents a fire-box provided with a suitable forward fuel-support F, consisting of a horizontal grate or base-plate, upon which the

fuel is to be placed as required for burning. At the rear of the grate or base-plate F is provided a series of inclined refractory fuel-supports H, having vertical sides, leaving narrow draft-passages intervening, forming a corresponding series of openings I, which communicate with a combustion-chamber K in rear of or opposite the said fire-box E, as shown, and which receive the incoming air from the chamber R'. The horizontal grate or base-plate F may be constructed solid, as shown in Fig. 2. These refractory fuel-supports H have a bearing at their front ends upon a ledge G or similar support, and at their rear end upon a ledge J or other suitable device adapted to retain the said supports H in the desired position and insure the proper intervening spaces I to be maintained throughout the said series of supports. The supports H are provided with inclined top faces or have their rear ends elevated, so as to incline forward at an angle of about thirty degrees, more or less, as desired. I prefer to construct them with their bottom, front, and rear end surfaces at right angles, as shown, and leave them with oblique top surfaces, thus providing increased heating areas rearward, so as to more perfectly burn the smoke and gases passing between them into the combustion-chamber, and by their intense heated radiating-surfaces "burn out" the flame or exhaust the chemical reactions, thus forming a perfect combustion of the fuel before the smoke and gases leave the combustion-chamber, leaving nothing but heated air and the products of practically complete combustion to pass over the deflecting-plates P and R<sup>2</sup> to the outlet or draft tube or funnel S, as shown in Fig. 1, and in the modification shown in Figs. 2 and 3. I contemplate providing the said fire-box E with a vertical deflecting draft-plate L, located near the rear ends of the said fuel-supports H, so as to leave a narrow vertical passage between the said plate L and the rear plate T, which forms the back side of the fire-box E, by which means a downward draft is produced between the rear ends of the fuel-supports, as shown in Fig. 3 by the direction of the arrows.

It will be seen and understood that the fuel placed upon the horizontal grate or base-plate F will extend over and upon the fuel-supports

H, so as to cover the same, but will gradually be reduced in depth from the front rearward, as the inclined top surface of the same will cause the fuel to work or drop forward while being consumed, and thus insure the said draft-passages being kept free or somewhat open at all times. By this construction I produce two drafts in the fire-box, the initial being upward and the terminal downward, as shown.

Having thus described my invention, what I claim is—

1. In combination with the outer case and draft-funnel of a stove, a fire-box within said case, a forward fuel-support F, and solid parallel refractory fuel-supports with inclined upper surfaces and intervening spaces in said fire-box, a draft-opening into the fire-box, a chamber with draft-door beneath and delivering air directly between said parallel fuel-supports, a combustion-chamber in rear of the fire-box, and a deflector-plate in the combustion-chamber, substantially as set forth.

2. In combination with the outer case and draft-funnel of a stove, a fire-box within said case, a fuel-support F, and solid parallel re-

fractory fuel-supports H, with inclined upper surfaces and intervening spaces between them in said fire-box, a draft-door opening into the fire-box, a chamber with draft-door beneath said grate, a second chamber with draft-openings beneath the refractory fuel-supports for delivering air directly between them, a combustion-chamber in rear of the fire-box, and a deflector-plate in said combustion-chamber, for the purpose described, and substantially as shown and set forth.

3. The combination, with the outer walls and draft-funnel of a stove, of a fire-box having a draft-opening, fuel-support F, and solid refractory triangular fuel-supports H, having inclined upper surfaces and set equidistant from each other, a draft and ash chamber below the fuel-supports, a combustion-chamber where the upper and lower drafts meet, and deflector-plates in said combustion-chamber, all substantially as shown, and for the purpose described.

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