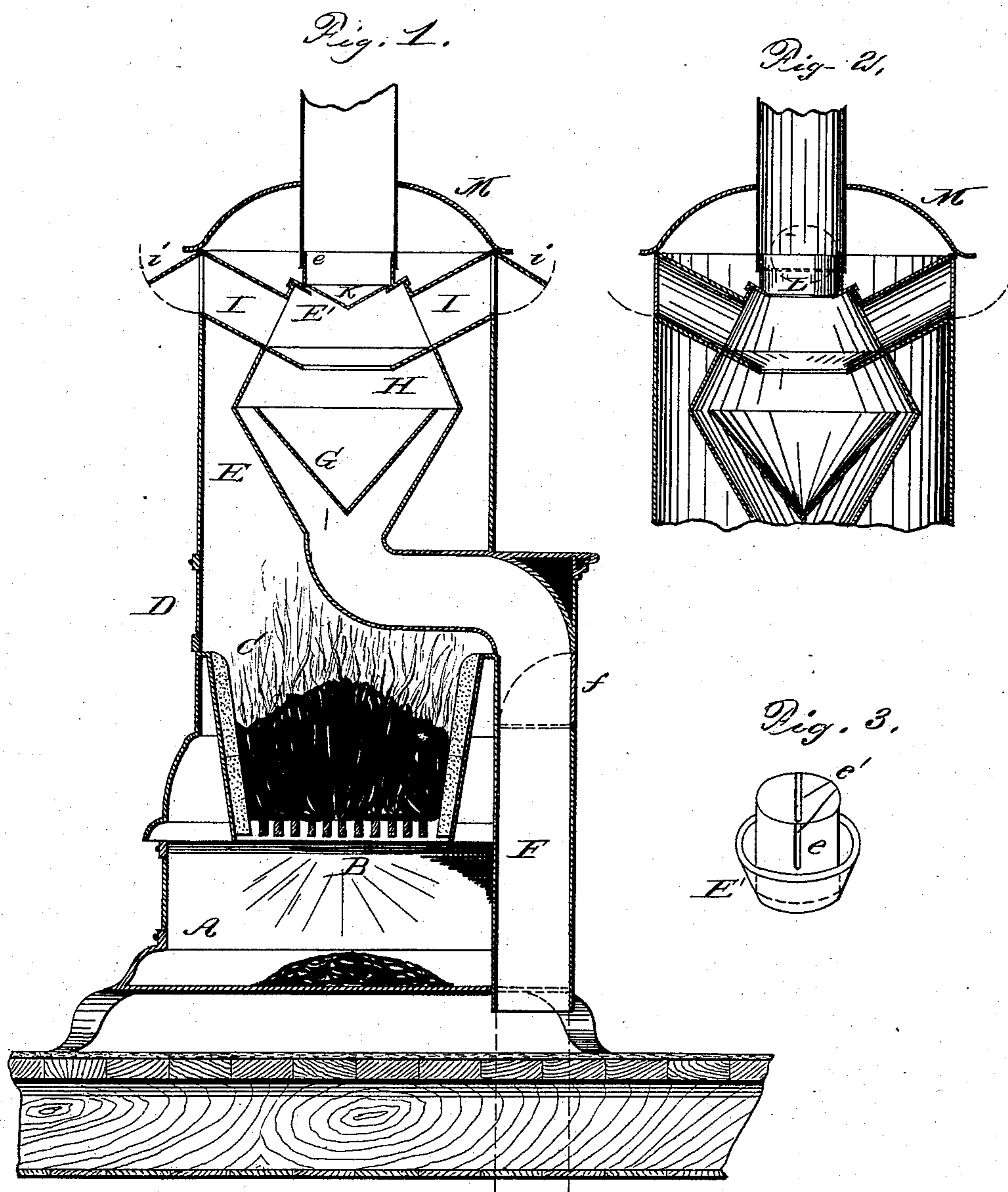


(No Model.)

C. O. GRAVES.  
HEATING STOVE.

No. 406,521.

Patented July 9, 1889.



Witnesses  
Thos. A. Hodgson  
J. Rufus Smith.

Inventor  
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# UNITED STATES PATENT OFFICE.

CHARLES O. GRAVES, OF WASHINGTON, KANSAS.

## HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 406,521, dated July 9, 1889.

Application filed April 13, 1888. Serial No. 270,578. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES O. GRAVES, a citizen of the United States, residing at Washington, in the county of Washington and State of Kansas, have invented certain new and useful Improvements in Heating-Stoves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to heating-stoves, and especially to those having a central air-tube.

The novelty of my invention lies in the construction and arrangement of the heating-drum and air-flues, as hereinafter pointed out.

In the accompanying drawings, Figure 1 is a vertical central section of a stove embodying my improvements. Fig. 2 is a view of the upper part of the stove differently arranged, and Fig. 3 is a detail.

The same reference-letters are used in all the figures.

The stove is provided with the ordinary ash-pit A, grate B, fire-pot C, and door D. The smoke and products of combustion pass off through a smoke-pipe. (Not shown.)

The body of the stove is of any desired shape, and above the fire-pot is suspended an air-heating drum E, preferably of the form shown, consisting of two frusto-conical sections united at their bases. The lower end of the drum is connected with the upper end of an inlet-pipe or air-flue F, which commences at the bottom of the stove, at the rear, and rises vertically behind the fire-pot to a point just above the same, where it curves in toward and to the center of the stove, at which point it curves upwardly and unites with the drum E. In the upper part of the vertical portion of the air-flue is an opening closed by a damper f, which is capable of being turned into the flue F, and closes the flue when it reaches a horizontal position, as indicated by dotted lines in Fig. 1. It may also be placed in an intermediate position, if desired. Inside of the drum E is suspended a deflector G, in the shape of an inverted cone. The dis-

tance between the sides of the drum and the tip of the deflector is about one-half the diameter of the opening in the base of the drum where the flue F enters. The angle between the sides of the deflector is greater than that between the sides of the drum E, so that the space between them decreases toward the upper edge of the deflector, which lies in or near the plane of the greatest diameter of the drum E. Above the deflector the sides of the drum converge, and about midway of them is a ring or annular flange H, projecting inwardly and downwardly, the width of the ring being a little more than one-half the radius of the drum at that point. This construction operates to turn the current of air down into the center of the drum, thereby holding it longer, and also causing a circulation of air in the lower part of the drum within the deflector, all of which greatly assists in the heating effect. Above the ring H one or more exit pipes or flues I pass from the drum E to the outside of the stove, being provided with suitable dampers i.

Surrounding the open top of the drum E is an inturned flange E', from which rises a short neck e, provided with diametrically-opposite slots e'. Fitting inside the neck and resting upon the flange E' is a dished lid or stop-plate K.

The operation of my stove is as follows: Cold air is drawn into the flue F either from some outside source or from near the floor of the room or from a point higher up, the entrance of cold air being controlled by the damper f. In its passage through the upper part of the flue the air is warmed, and when spread into a thin sheet by the deflector G it quickly becomes heated. The ring H interrupts the air-current and compels it to circulate within the drum, whence it finally escapes through the flues I into the room. In case it is desired to heat an upper apartment in the house, the stop-plate K is removed, a damper L is journaled in the slots e', and the lower end of a pipe M is slipped over the neck e, as shown in Fig. 2. This pipe can be led to any desired point and the hot air delivered there. By closing the dampers i the entire volume of air passing up the flue F is available for warming an upper room.

It will be seen that I do not interfere with the ordinary function of the stove as source of radiant heat, but enable it to warm a much greater volume of air than it otherwise could.

5 It can be used to ventilate the room in which it is placed by taking the foul air from near the floor and conveying it through pipe M to the outside of the house.

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

1. The combination, with a stove, of the air-heating drum E, suspended inside of the same, having frusto-conical sides, inlet-flue  
15 F, entering the stove above the fire-pot, upwardly-inclined exit-pipes I, provided with dampers *i*, flange E', and the removable dished stop-plate K, substantially as described.

2. The combination, with a stove, of an air-  
20 heating drum E, having frusto-conical sides, a conical deflector G, suspended therein, an

inwardly and downwardly inclined annular flange H, above the deflector, inlet-flue F, entering the stove above the fire-pot, and exit-pipes I, substantially as described. 25

3. The combination, with a stove, of an air-heating drum E, having frusto-conical sides, a conical deflector G, suspended therein, an annular flange H, above the deflector, inlet and exit flues, flange E', and stop-plate K, 30 substantially as described.

4. The combination, with a stove, of an air-heating drum E, having inlet and exit pipes, flange E', provided with a neck *e*, having slots *e'*, and a removable plate for closing the  
35 neck, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES O. GRAVES.

Witnesses:

OMAR POWELL,  
F. C. GRAVES.