

H. GREENTREE.  
Base-Burning Stoves.

No. 151,874.

Patented June 9, 1874.

Fig. 1.

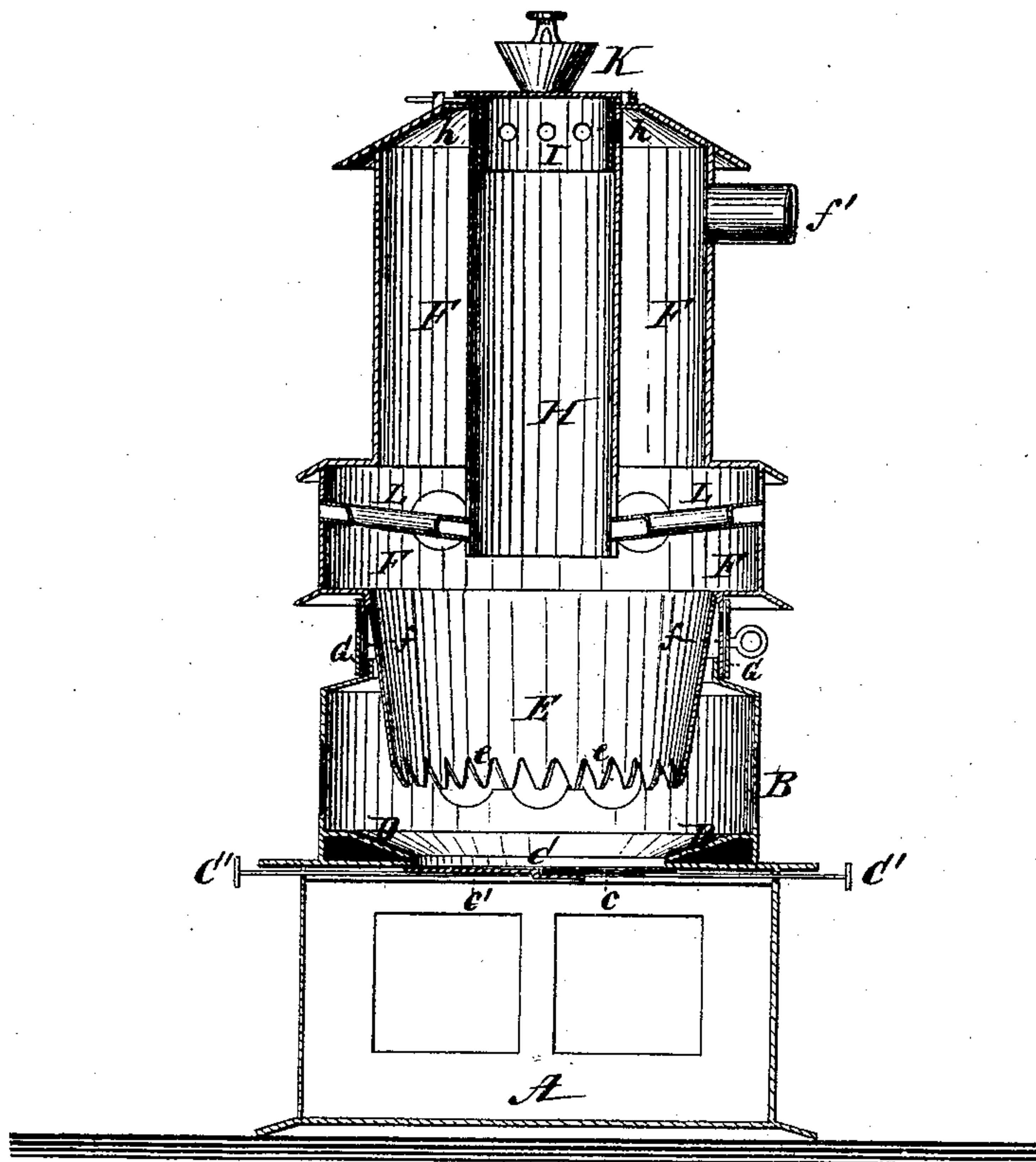
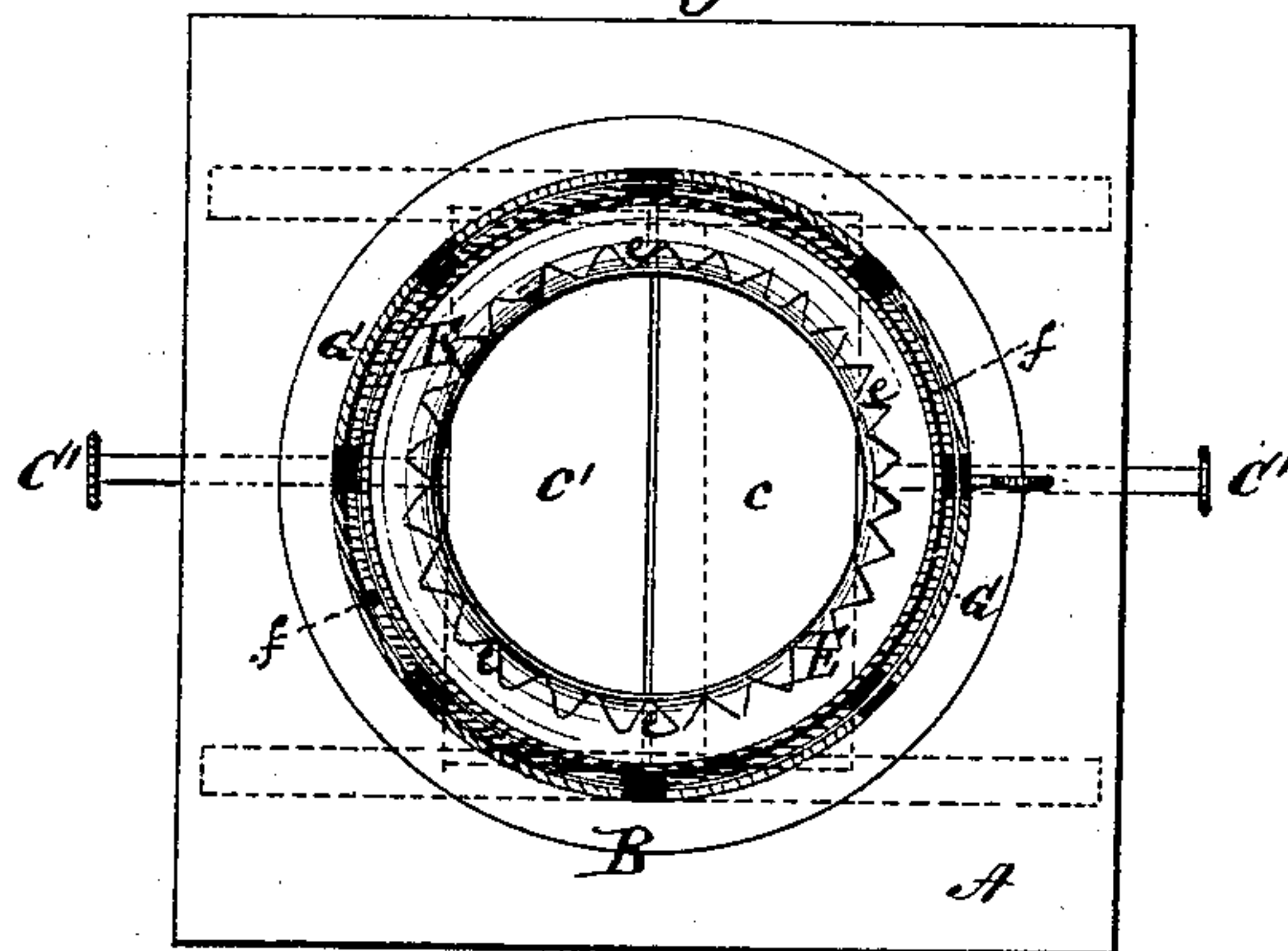


Fig. 2.



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HOWARD GREENTREE, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN BASE-BURNING STOVES.

Specification forming part of Letters Patent No. **151,874**, dated June 9, 1874; application filed April 30, 1874.

*To all whom it may concern:*

Be it known that I, HOWARD GREENTREE, of Baltimore city, and State of Maryland, have invented a new and Improved Base-Burning Stove; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a sectional elevation; Fig. 2, a plan view.

The invention will first be fully described, and then pointed out in the claims.

A represents the base or ash-pit of a stove; B, the fire-chamber, and C the intermediate bottom of the latter. This bottom is imperforate, but made in two divisions that conjoin diametrically, and are slid apart or together by rods C', the section *c* being preferably provided with a lower lip or flange, over which slides and fits the other section *c'*. One is operated preferably after the other, while the cohering coals rest in the conical fire-pot E, having inward scalloped projections *e*. D is a circular beveled or sloping plate that surrounds the hearth, and serves to keep the ashes and clinkers from contact with the outer casing of the stove. The fire-pot E projects low down into the fire-chamber, and sustains a supply of coal that is gradually fed forward therefrom by gravity, as the fuel below disappears. A supply of air or oxygen is received through the registering-holes of perforated flange *s* of the draft-chamber F and correspondingly perforated ring G. H is the usual self-feeding coal-tube, placed in the center of draft-chamber F, that has the discharge-pipe *f'*. *h* is one or more holes near the top of tube H, and I a rotary top-flanged tube that fits into tube H and has corresponding holes, the tube I rotating within the tube H to make their respective holes register or otherwise. K is the cap which ordinarily fits over tube H to prevent the exit therefrom and into the room of the coal-gas, being sometimes hinged and sometimes simply removable. L are a series of tubes leading from the outside of smoke-flue F to the lower part of the inside of coal-tube H, for the purpose of supplying oxygen to the unconsumed products of combustion.

The theory and application are as follows: As combustion progresses in all coal-burning apparatus, it is necessary to get rid of the ashes and clinkers; otherwise the supply of air to the fire is soon cut off and the fire goes out. To obviate this, various shapes and styles of grates have been adopted, all of which, however, in order to free the apparatus, must be shaken. This operation, while it removes some of the ashes and makes vents through which air can again, for a brief time, pass to the fire and force combustion, still allows the clinkers (that are too large to pass through the bars) to remain on the grate; and, as it also disturbs all the fuel in the stove, the partially as well as the unignited coals will, of their own gravity, fall below the point of combustion, and, mixing with the ashes and clinkers, will soon collect in such quantities on the grate as to make it necessary to dump the same, when these unconsumed coals pass to the ash-pile and are wasted.

To overcome these serious objections to all shaking grates, I have invented what I call a hearth without grating, slats, or perforations. This hearth is made in two sections, overlapping each other in the center, to each of which is attached a rod protruding through the walls of the base of the stove. When a fire is to be built in the stove, these two sections are slid together and form a close hearth, as near air-tight as possible, the object being to exclude if possible any air from reaching the fire through the base, the object in having the sections slide being to make an opening through which the ashes and clinkers will pass to the ash-pan below, and by using one side at a time, the one remaining in position, together with the inward-curving projections on the fire-pot, will hold up the fuel while the other section is pulled out to dump the ashes and clinkers. If, however, the arched or bridged coals in the fire-pot be not disturbed, both sections may be slid out without fear of dropping the fire from above.

It will be seen that my plan is to burn coals without disturbing them; to build a fire on the hearth, and when ashes and clinkers have accumulated, remove them without any agitation, leaving a clean fire, without any obstruction to the air required to support com-



bustion, and when other ashes and clinkers accumulate remove them in the same way, and in this way sustain a continuous fire and consume all the coal.

Having a solid hearth, it will be seen that other means must be provided for the introduction of air to support and force combustion. This I accomplish by taking in the air through the outer wall of the stove, just below the top of the fire-pot, into a space between the two, the top of the fire-pot forming an air-tight joint where it joins the body of the stove. This air is compelled to seek a passage to the fire down the space above mentioned, and along and over the heated fire-pot to its bottom, where it enters the fire, and being heated before reaching it, the tendency of cold air to chill the fire is obviated, and the heat required to overcome this chill saved and otherwise applied. In order to regulate this draft, I use an annular damper, by the use of which I am enabled to thoroughly control the fire.

It will be noticed that the lower part of the fire-pot is scalloped, with the points curving inward. The object of the inward curve is explained above. The space between these points, together with the space between the lower end of the fire-pot and the hearth, affords space for illumination through the lower tier of mica windows; and as some ashes will probably accumulate outside of the fire-pot, I have placed a sloping plate between the windows and fire-pot, which will tend all the ashes toward the opening between the fire-pot and hearth. By the above-mentioned combination I am enabled to perfectly consume the fuel, and make all the heat possible out of a given amount of coal.

Many have been the devices invented and used for introducing and mixing oxygen with the gases that are disengaged from burning coal, and burning the same. But few of them accomplished the purpose, acting under the reasonable belief that these gases are disengaged where the coals first come in contact with the fire, which place in a magazine-stove

would be at the discharge end of the magazine. I naturally concluded that this was the place to introduce the oxygen, it being a point where ignition must take place. To accomplish this, I tap the wall of the stove at several points, and with tubes carry the oxygen to the lower end of the magazine. I have thus succeeded in making as nearly perfect combustion as it is possible to accomplish—first, by burning all the gas in the coal at the discharge-end of the magazine, and in burning all the coal to ashes in the fire-pot below.

In all base-burning stoves it has been found necessary to get rid of the gas when the top of the magazine was removed to put in coal. Some employ slides, valves, &c., while others perforate the top of the magazine, so that the gas will always find vent into the body of the stove and escape by the pipe. Of course those using the latter mode cannot claim that their stoves are gas-burners, while the former, having no inlet for oxygen, can burn the gas only imperfectly.

It will be noticed that mine is a complete device, being an annular damper placed within the magazine, with a flange resting on the top thereof and covered by the urn. When necessary to feed coal, it is only necessary to push the damper, and in a twinkling the gas is gone and the covering can be removed, and instead of a puff of gas into the room the draft will be inward and down the magazine.

Having thus described my invention, what I claim as new is—

1. A fire-box hearth made of imperforate parts C D, the former made in sliding sections, as and for the purpose described.

2. The described combination of correspondingly-perforated flange *f* and ring G, to admit air to the fuel for supporting combustion between the fire-box and the shell of fire-chamber.

HOWARD GREENTREE.

Witnesses:

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