H. H. McMASTER.

COKING STOVE.

APPLICATION FILED JAN. 28, 1910.

963,631.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

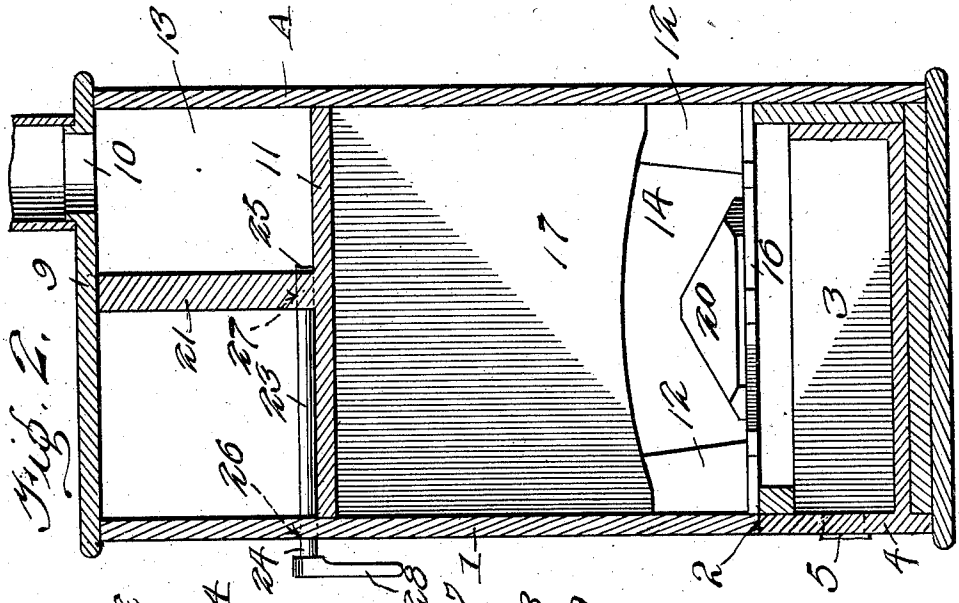

Fig. 2.

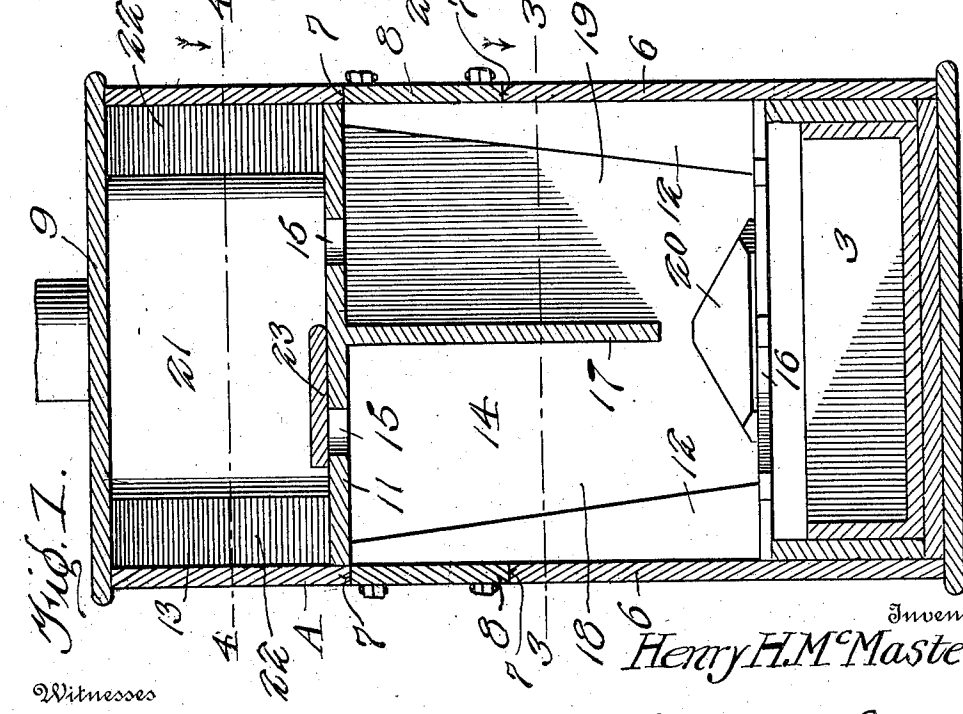

Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

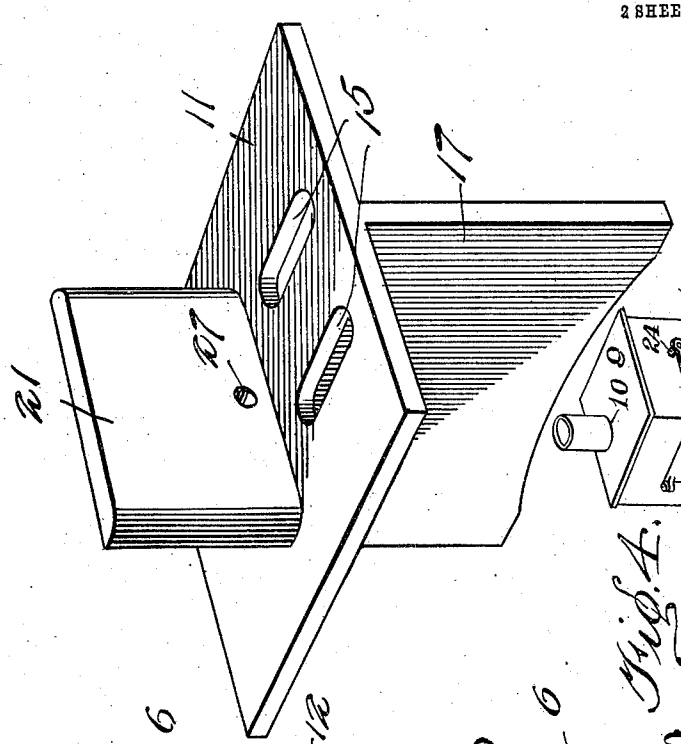


Fig. 6.

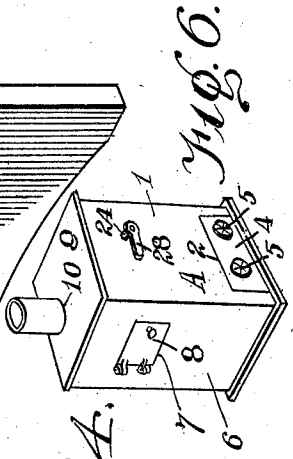


Fig. 4.

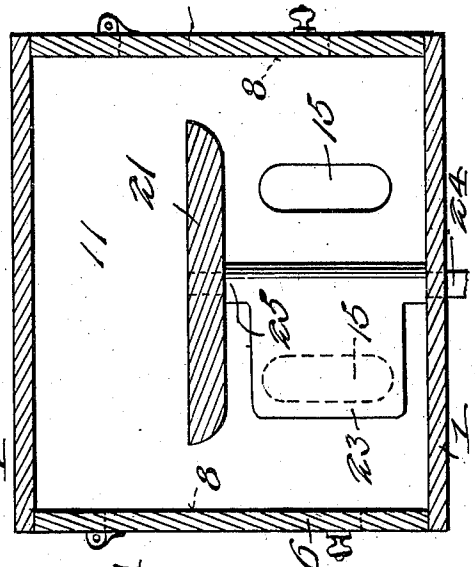
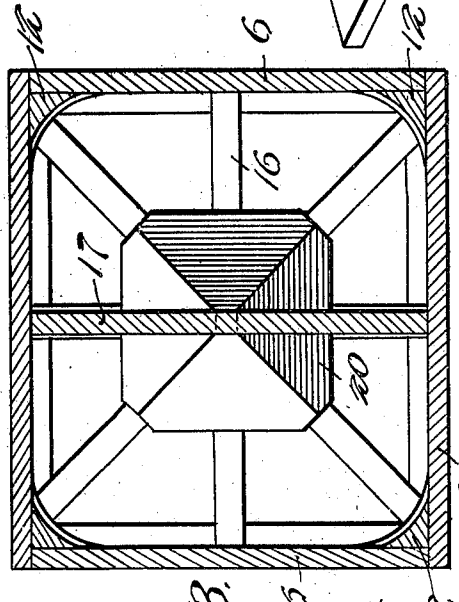


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY H. McMASTER, OF CLAIRTON, PENNSYLVANIA.

COKING-STOVE.

963,631. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed January 28, 1910. Serial No. 540,648.

To all whom it may concern:

Be it known that I, HENRY H. McMASTER, a citizen of the United States, residing at Clairton, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Coking-Stoves, of which the following is a specification.

This invention relates to stoves or furnaces of that type in which a coking action of the coal can be produced, and the principal object of the invention is the provision of a stove or furnace having separate chambers which are used alternately, one for coking coal while combustion takes place in the other compartment, the arrangement of the chambers or compartments being such that an effective coking action, as well as complete combustion of the smoke and gases and fuel can be obtained.

Another object of the invention is to improve and simplify the construction and operation of stoves of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and readily manipulated and managed.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention; Figure 1 is a central vertical section of the stove taken parallel to the front thereof. Fig. 2 is a vertical section taken at right angles to the section of Fig. 1. Fig. 3, is a horizontal section on line 3—3 of Fig. 1, taken through the combustion chambers. Fig. 4 is a horizontal section on line 4—4 of Fig. 1, taken through the smoke box or heating chamber. Fig. 5 is a perspective view of the partitions which divide the stove into combustion and heating chambers, and showing the draft controlling means. Fig. 6 is a perspective view of the stove drawn on a reduced scale.

Similar reference characters are employed to designate corresponding parts throughout the several views.

Referring to the drawings, A designates the body or casing of the stove, which may be of any approved construction, size and design; the stove in the present instance being of rectangular form. The front 1 of the body has an ash pit opening 2 at its bottom for receiving an ash pan 3, the front plate 4 of which is provided with valve controlling draft openings 5. In the side walls 6 of the casing or body A are openings 7, through which the coal is fed to the combustion chambers and these openings are normally closed by doors 8. The top 9 of the casing has adjacent its rear edge an outlet or flue opening 10 which is connected with the flue or pipe for carrying off the products of combustion. Except for the ash pit opening, fuel feeding openings, and flue gas openings, the casing or body is solid or air tight at all other points.

Arranged within the body A is a horizontal partition 11, which is located at a point immediately above the fuel supply openings 7 and this partition rests on upright corner pieces 12, arranged within the body by which the front, rear and side walls are connected together. This partition 11, which divides the body into an upper heating chamber or smoke box 13 and a lower combustion chamber 14, has ports 15, through which the products of combustion rise from the latter to the former chamber, these ports being arranged close to the front wall of the stove.

Between the chamber 14 and ash pit is a grate 16 extending horizontally across the stove. The chamber 14 is divided by a vertical partition 17 into separate compartments 18 and 19, which communicate only at a point between the bottom edge of the partition 17 and the grate, the partition being placed above the latter and extending from the front to the rear wall of the stove and arranged contiguous with the horizontal partition 11. It is also to be noted that the partition 17 is disposed between ports 15 so that each compartment will have an outlet into the chamber 13. The grate 16 is of special construction in that it is provided with a pyramidal or conical center piece 20, which obstructs the draft at the center of the grate and causes the air to feed from the ash pit along the outer walls of the compartments, thus insuring uniform combustion at all points. The bottom edge of the partition 17 is arched to more or less conform to the center piece 20 so that air and gas will pass under the partition more uniformly at all points.

Referring again to the chamber 13, it will be observed that the same is provided with

the vertically disposed baffle plate 21, extending parallel with the front and rear walls and from the horizontal partition 11 to the top of the stove. This baffle plate is of less length than the width of the chamber 13, and the ends of the plate are spaced from the side walls of the stove so as to provide ports 22, through which the products of combustion pass from the ports 15 to the flue opening 10, the baffle plate being located between the ports 15 and flue opening. Arranged between the ports 15 is a damper or valve 23, which has forwardly and rearwardly extending journals 24 and 25, which are disposed in bearings 26 and 27 in the front wall 1 and baffle plate 21, and the journal 24 has a noncircular extremity for receiving an operating crank 28. This valve or damper 23 is adapted to swing through an arc of 180° so as to close one port 15 or the other, depending upon whether combustion is taking place in either compartment 18 or 19, and when the valve is closed, it bears flat against the top surface of the horizontal partition 11.

In operation, a fire is kindled on the grate so as to produce a bed of hot coals under both compartments 18 and 19, it being necessary to place the damper or valve 23 in a mutual position where both ports 15 are open. After combustion has continued a sufficient period, one compartment is filled with coal through the openings 7 thereof, then the damper 23 is moved to close port 15 of that compartment which has been filled, thus allowing no gas or smoke to escape except that which is drawn down under the partition by the upward draft in the compartment in which combustion continues. The coal in the closed compartment will consequently be formed into coke so as to be in condition for perfect combustion when the coal in the other compartment is consumed and at this time the previously closed port 15 will be opened and the previously opened port closed, so that the draft will be reversed and combustion of the coke will take place. A fresh charge of coal is supplied to the other compartment while the coke is being consumed so that the making of coke from the fresh charge of coal will be continued. In this way each compartment is alternately used for first making coke and then consuming it. The device is in effect a double stove in a unitary structure, and the operation is such that a maximum heating effect can be produced since there is always a charge of coke available when combustion in either compartment is completed.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention relates, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative and that such changes may be made when desired as are within the scope of the invention.

What I claim as new and desire to secure by Letters Patent is:

1. A stove of the class described, comprising a casing, a partition in the casing dividing the same into upper and lower heating and combustion chambers, said partition having outlet ports for the products of combustion, a grate in the bottom of the casing, an upright partition extending between the opposite walls of the casing and from the first mentioned partition to a point adjacent to but spaced from the grate to divide the combustion chamber into separate compartments which communicate through the ports with the heating chamber, means for admitting air under the grate, said grate having an imperforate middle portion for causing the air to pass through the grate near the walls of the combustion chamber, means at opposite sides of the casing for charging each compartment with fuel, means for conducting away the products of combustion from the heating chamber, and means for establishing communication between the one compartment and heating chamber but cutting out communication between the other compartment and heating chamber.

2. A stove of the class described, comprising a casing a horizontal partition dividing the same into upper and lower heating and combustion chambers, a vertically disposed partition extending downwardly from the first mentioned partition and disposed contiguous with opposite walls of the casing to provide coking and combustion compartments communicating with each other at a point only below the bottom edge of the vertical partition, said horizontal partition having ports at opposite sides of the vertical partition, means for admitting air to the lower end of either compartment, means at the upper end of each compartment for supplying fuel thereto, means for conducting away the products of combustion from the heating chamber, a baffle plate arranged in the heating chamber between the said ports and last mentioned means, and a valve mounted to close one port or the other to provide an updraft in one compartment while coking of the coal takes place in the other compartment.

3. In a stove of the class described, the combination of a casing having an ash pit in the bottom thereof, a grate above the ash pit having an upwardly tapering imper-

forate center piece whereby the grate is solid at the center, a partition disposed centrally above the center piece and spaced therefrom to form separate compartments communicating with each other only between the bottom edge of the partition and the grate, each compartment having an outlet, means gases of the closed compartment to pass through the grate to either compartment, a draft controlling device arranged to close the outlet of one compartment while leaving the outlet of the other open to cause the gases of the closed compartment to pass under the partition to the other compartment, and means for charging the compartments with fuel.

4. In a stove of the class described, the combination of a casing having an ash pit in the bottom thereof, a grate above the ash pit having an upwardly tapering imperforate center piece whereby the grate is solid at the center, a partition disposed centrally above the center piece and spaced therefrom to form separate compartments communicating with each other only between the bottom edge of the partition and the grate, means for admitting air to the ash pit to pass through the grate to either compartment, the bottom edge of the partition being arched to substantially conform with the contour of the center piece, each compartment having a port at its top to form an outlet for the products of combustion, and a valve for opening one port and closing the other to cause combustion in one compartment while the coal cokes in the other compartment.

5. In a stove of the class described, the combination of a casing divided into separate combined coking and combustion compartments communicating with each other only at their lower ends, means for supplying air to the lower ends of the compartments, a partition in the casing for closing the upper ends of the compartments and providing a heating chamber in the upper portion of the casing, said partition having ports through which the compartments communicate with the chamber above the partition, a baffle plate arranged in the said chamber at one side of the ports, means at the side of the baffle plate opposite from the ports for conducting away the products of combustion, a swinging valve journaled in the baffle plate and in one wall of the casing with its axis disposed between the ports and arranged to bear flat on the partition to close one port or the other, and means exteriorly to the casing for actuating the valve.

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

HENRY H. McMASTER.

Witnesses:
SAMUEL GLICK,
PAUL LUBOS.