

No. 836,046.

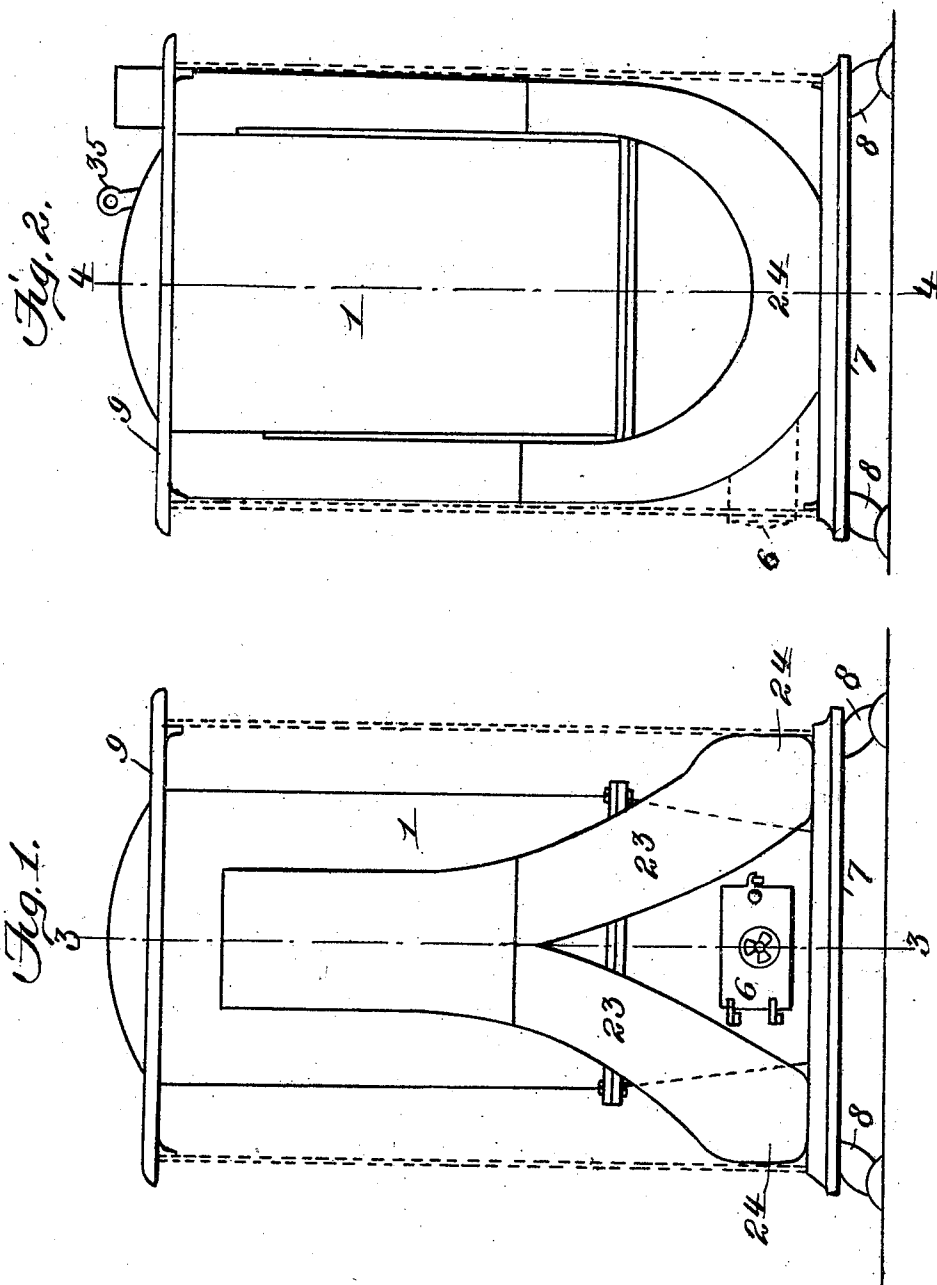
PATENTED NOV. 13, 1906.

J. M. MITCHELL.

STOVE.

APPLICATION FILED OCT. 2, 1906.

2 SHEETS—SHEET 1.



Witnesses:
C. D. Hester
Dennis Dumbly

Inventor
James M. Mitchell
By James L. Norris
Atty.

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2 SHEETS—SHEET 2.

Fig. 4.

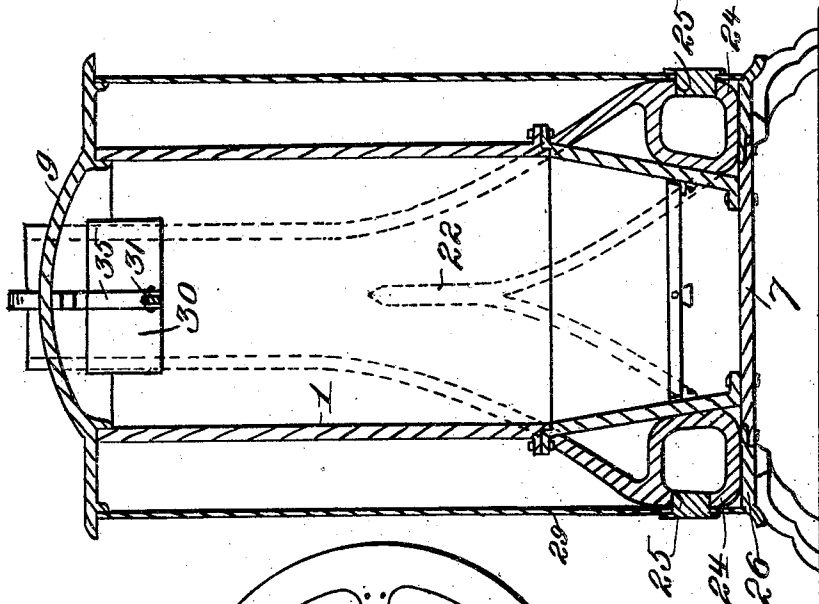


Fig. 5.

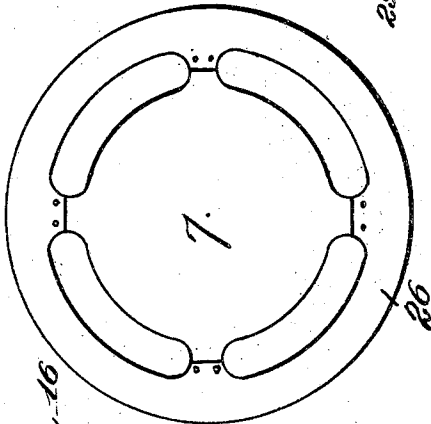
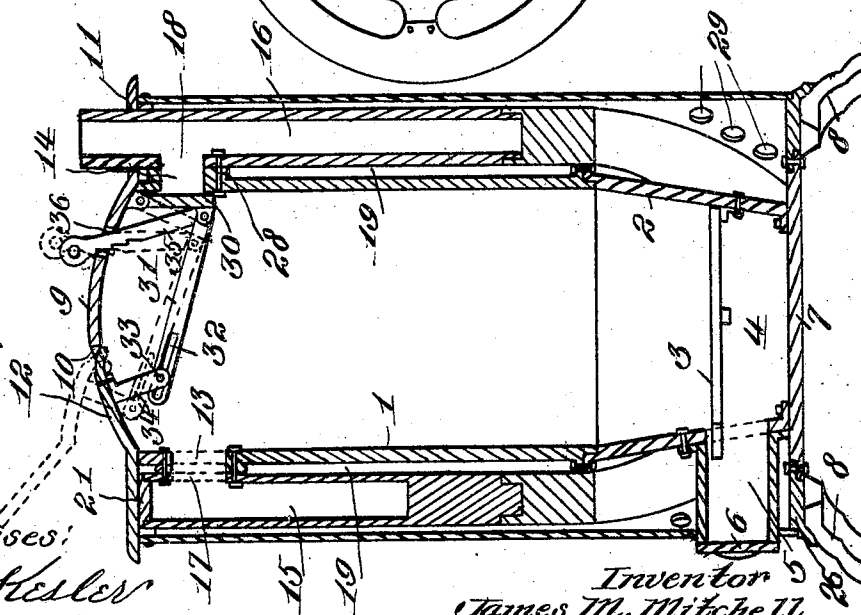


Fig. 3.



Witnesses:
C. D. Keller
Dennis Sumby.

Inventor
James M. Mitchell
By James L. Norris
Atty.

UNITED STATES PATENT OFFICE.

JAMES M. MITCHELL, OF ST. LOUIS, MISSOURI.

STOVE.

No. 836,046.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed October 2, 1905. Serial No. 281,022.

To all whom it may concern:

Be it known that I, JAMES M. MITCHELL, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented new and useful Improvements in Stoves, of which the following is a specification.

This invention relates to stoves of that class having continuous down and up draft flues for heating the lower strata of air and also increasing the general heating characteristics of the stove by fully utilizing the caloric of the products of combustion before permitting the latter to pass off into a smoke-flue or chimney.

The down and up draft flues in the improved stove are attached to the exterior of the stove-body, and the upper terminals thereof respectively communicate with the heat-chamber defined by the stove-body and the smoke flue or pipe at diametrically opposite points and also merge into lower oppositely-disposed divergent auxiliary flues, through which the down and up currents of heat and products of combustion are established by intermediate partitions or analogous dividing means. The flues are rendered accessible at their upper enlarged extremities or main portions and also at the bottom of the auxiliary flues for cleaning purposes. The use of the down and up draft flues not only increases the heat-radiating surface or area by conveying the heat generated from fuel of any character downwardly close to the floor or other base-rest of the stove before discharge into the chimney, but economizes in the consumption of fuel and also beneficially effects a materially greater area of space or volume of air surrounding the stove than is possible by the use of the ordinary direct-draft stove or by other down and up draft stoves now in use.

The improved continuous down and up draft stove also increases the circulation of air in a room or inclosure to be heated and causes the air to become more nearly pure, and thus improve the sanitary condition of the inclosure or building heated by the stove.

The improved stove is also so constructed as to prevent to any possible degree the escape therefrom of smoke, gas, ashes, and soot into the room or building.

A further object of the invention is to construct a stove having continuous down and up draft flues of a comparatively simple and inexpensive nature, capable of being easily

repaired and kept in good order, and readily controlled by inexperienced persons.

It is proposed to form the improved stove in any shape desired, either round, oblong, or square, and such materials will be employed in the construction of the several parts as will best subserve the purpose for which it is intended or to effect a modification in the cost of manufacture in accordance with the grade of the stove embodying the features of the invention.

The improved stove also includes in its organization a damper apparatus to convert it from either a down and up draft flue stove or a direct-heating apparatus or one having communication directly between the fire-bed and heating-chamber with the smoke-pipe or flue, such damper apparatus having an automatic actuation when operated under one condition and also adapted to be manually controlled independent of the automatic movement of the parts thereof.

The stove-body and flues are incased in an open or fret work inclosure, which may be either sheet-steel or cast-iron now in general use, the openings in the casing or inclosure permitting a full heat radiation and also serving to ornament the stove.

Other advantages and important details of construction will be hereinafter more fully set forth.

In the drawings, Figure 1 is a front elevation of a stove embodying the features of the invention and showing the outer casing or inclosure in dotted lines. Fig. 2 is an elevation of the stove at an angle to the position thereof shown by Fig. 1 and also illustrating the outer casing or inclosure in dotted lines. Fig. 3 is a transverse vertical section on the line 3 3, Fig. 1. Fig. 4 is a transverse vertical section on the line 4 4, Fig. 2. Fig. 5 is a detail plan view of the stove-bottom and sectional ring therefor.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a stove-body, which is shown cylindrically straight and comprising a fire-pot or bowl 2, a grate 3 of any preferred construction, an ash-pit 4, and the usual draft-opening 5, having a door or cover 6 for rendering the ash-pit accessible, the door or cover 6 being provided with a suitable damper to control the draft. As before indicated, the grate may be of any pre-

ferred form, such as rotating, slidable, bar-pull, dumping, or any other type. The body 1 is disposed upon a bottom 7, having feet 8 attached thereto, or in some instances said bottom may be directly disposed on a brick or masonry base. When feet are attached to the bottom or base-plate 7, they will be of such height as to bring the plate close enough to the floor to heat the lower stratum of air through the medium of the arrangement of down and up draft flues, which will be more fully hereinafter set forth. A top 9, preferably formed with a central dome, is secured to the upper terminal of the body 1 and has at diametrically opposite points openings 10 and 11, the opening 10 communicating with the heating-chamber defined by the body 1 for the purpose of introduction therein of fuel. The opening 10 is normally closed by a cover or feed-door 12, hinged or otherwise movably connected at its inner terminal to the top 9. In the body 1, immediately below the opening 10, is an outlet-opening 13, and at a diametrically opposite point the body also has a flue-communicating opening 14 formed therein to establish direct communication between the heating-chamber and the escape flue or pipe connection for the products of combustion.

Down and up draft flues 15 and 16 are attached to diametrically opposite portions of the exterior of the body 1 and communicate through the medium of openings 17 and 18 in the inner walls thereof, respectively, with the openings 13 and 14, the flue 15 being at the front and the flue 16 at the rear of the stove-body and completely inclosed, spaces 19 being formed between the inner portions of the flue and the stove-body to increase the heat-radiating surface or area of the stove. The rear up-draft-flue 16 is continued through the opening 11, formed in the top 9, and the upper projecting extremity of said flue 16 is adapted to have a smoke-pipe or other conduit attached thereto. The downdraft-flue 15 at the front of the stove has its upper extremity terminating about equally with the upper end of the stove-body and is closed by a removable cover 21, located directly under the cover or feed-door 12. Normally the lid or cover 21 is fitted in the upper end of the flue 15; but when it is desired to clean said flue this lid or cover is removed after it is rendered accessible by elevating the cover or feed-door 12. The flue 16 may be readily cleaned from the upper end thereof by detaching the smoke pipe or conduit therefrom. The flues 15 and 16 have at their lower portions central partitions or division-walls 22, from which auxiliary flues or branches 23 diverge, the said auxiliary flues being of smaller dimensions than the upper main flues 15 and 16. The lower divergent auxiliary flues or branches 23 merge into and are continuous with lower elbows or regularly-curved bends 24, which have their lower portions in close contact

with the bottom or base-plate 7 of the stove. The flues as an entirety, including the upper enlarged extremities or main flues and the lower auxiliary flues or branches, may be of any suitable form in cross-section and constructed either by casting or from sheet metal, and various methods may be adopted for attaching them to the stove-body and also to the top 9 and the bottom or base-plate 7. By branching the lower portions of the flues or providing auxiliary flues 23 of smaller dimensions the heat-currents and products of combustion are caused to affect a greater area around the lower part of the stove and practically modify or heat the lower stratum of air in a room or compartment in which the stove may be located, and by thus heating the lower stratum of air a more nearly perfect ventilation and heat circulation will be set up with economy in the use of fuel and better results generally. The lower elbows or bends 24 of the auxiliary flues or branches 23 are formed with lower openings 25 of suitable extent and normally closed by any preferred form of flue-stopper or covering-plate. These openings 25 are for the purpose of cleaning and removing any accumulations of soot and ashes. The flues will be so applied to the body that at times they may be detached for cleaning and repairing purposes and capable of being readily reset without disassociating the remaining parts of the stove structure. The bottom or base-plate 7 is rendered effective as a supporting means for the lower auxiliary flues and also to extend the said bottom plate by application thereto of a sectional ring 26, connected in any suitable manner. The opening 18 in the flue 16 communicates or coincides with the opening 14 in the upper rear portion of the stove-body 1 close to the top 9 to provide communication directly between the fire-bed and heating-chamber with the smoke pipe or flue in a manner which will be more fully hereinafter set forth.

Between the flues 15 and 16 at the points where the openings 17 and 18 communicate, respectively, with the openings 13 and 14 suitable space-closing projecting means 28 are interposed and in the form of a flange or bead, which is bolted or otherwise removably secured to the body 1 and as clearly shown by Fig. 3.

Surrounding the body 1 and flues 15 and 16 and the lower branch or auxiliary flues is an open-work casing 29, of either sheet or cast metal, closely engaging at its upper and lower ends the top 9 and the base-plate or bottom 7. This casing gives the stove or heating apparatus an ornamental appearance and hides to some extent the flues set forth without in the least interfering with the heat radiation.

The improved stove is also provided with a novel damper mechanism embodying a de-

pending damper 30, pivoted or hinged at its upper end to the top 9 and depending normally over the inner portion of the opening 14. Pivotally attached to the inner side of the lower extremity of the damper 30 is a transversely-extending bar 31, having a longitudinal slot 32 in its free extremity engaged by a coupling stud or projection 33 on the lower end of a crooked arm 34, depending from the cover or feed-door 12. Attached to the bar 31, adjacent to the damper 30, is a pull rod or bar 35, suitably notched at its inner edge and normally projecting upwardly through an opening 36 in the top 9 for manually operating the damper. The damper 30 can be adjusted or opened to any desired extent by causing the notches in the inner edge of the pull rod or bar 35 to engage the adjacent wall or portion of the said wall of the opening 36. The purpose of this damper organization is to change the stove from a down and up draft flue type to a direct-draft stove, and when the cover or feed-door 12 is raised an upward pull is exerted on the slotted extremity of the bar 31 through the medium of the arm 34, and the damper 30 is by such operation of the cover and slotted arm drawn inwardly away from the opening 14, and hence when the stove is supplied with fuel the draft will be direct from the fire-bed upwardly through the body 1 into the smoke-pipe or other chimney-communicating conduit. When the door 12 is fully opened, the arm 34 and the remaining parts of the damper organization assume the position illustrated by dotted lines in Fig. 3. When the door 12 is closed and it is desired to arrange the stove to have a direct draft, the pull rod or bar 35 is drawn upwardly through the opening 36 and secured in adjusted position to hold the damper 30 open to any extent that may be desired, and under such conditions the bar 31 slips loosely over the coupling device or projection 33. The improved damper mechanism is located in the heat or fire chamber in the upper part of the body, the damper itself swinging inwardly into the heat-chamber, and hence does not obstruct the draft of the flues in contradistinction to other damper arrangements now in use with downdraft-stoves and which swing into and over the top of the flues with many disadvantages in the draft of the said flues.

The entire stove, including the damper organization, will be found very effective in heating an inclosure or compartment without requiring excessive use of fuel. The continuous disposition or arrangement of the down and up draft flues has many advantages aside from those already mentioned and gives strength to the draft and also obviates the cross-currents which occur in dead-air chambers and causes the soot and ash-dust to lodge and choke up the flues in down and up draft stoves as now commonly con-

structed. The improved continuous flue embodied in this stove lessens the number of parts and pieces ordinarily utilized in forming down and up draft flues, thus making the entire structure more durable and less liable to spread at joints and form openings which would destroy the draft, as in structures where a number of joints exist.

Having thus described the invention, what is claimed is—

1. A stove of the class set forth, having a body with openings at the upper portion thereof at diametrically opposite points and both communicating with the interior of the body and one with the smoke-escape, and continuous down and up draft flues attached to the exterior of the body and consisting of upper enlarged main flues merging into lower oppositely-positioned divergent smaller flues.

2. A stove of the class set forth, having a body with openings in the upper portion thereof at diametrically opposite points and both communicating with the interior of the said body and one with the smoke-escape, and continuous down and up draft flues attached to the exterior of the body and consisting of upper enlarged main flues merging into lower oppositely-positioned divergent smaller flues, the latter having their lowest portions at the bottom of the stove.

3. In a stove of the class set forth, a body having a grate and constituting a fire-chamber, and a continuous down and up draft flue means applied to the exterior of the body and comprising upper enlarged main flues and communicating with the interior of the body and the smoke-escape, and lower oppositely-positioned divergent smaller flues also located on the exterior of the body and merging at their upper extremities into the main flues, the said smaller flues having their lower portions located at the bottom of the stove.

4. A stove of the class set forth, having a body forming a fire-chamber, continuous down and up draft flues communicating with the upper portion of the interior of the body and the smoke-escape and consisting of upper main flues and oppositely-positioned divergent lower flues merging into the main flues, the upper end of one of the main flues forming the outlet for products of combustion and the lower flues located on opposite sides of the stove close to the bottom of the latter.

5. A stove of the class set forth, having a body constituting a fire and heating chamber, and continuous down and up draft flues applied to the exterior of the body and communicating with the latter and the smoke-escape means, the said flues having their inner sides spaced from the body against which they are attached, the upper extremities of the flues both having communication with the body and the one flue with the smoke-escape means, the lower portions of the flues

being divided and provided with diverging smaller flues extending over opposite sides of the stove.

6. A stove of the class set forth, having a body constituting a fire and heating chamber and provided with upper openings, one of said openings leading to the smoke-escape and being closed to communication with the body and the other continually in communication with the latter, continuous down and up draft flues applied to the exterior of the body, one of the flue-terminals coinciding with the opening in continual communication with the body, and the other flue terminally connecting with the smoke-escape means, the lower portions of the flues having diverged smaller flues communicating therewith and extending over opposite sides of the stove-body and having their lower portions at the bottom of said body, and damper mechanism coöperating with the opening which leads to the smoke-escape and normally closed with respect to the body and operative to convert the stove from a down and up draft into a direct-draft structure.

7. In a stove of the class set forth, a body constituting a fire and heating chamber, and having a top with diametrically-opposed openings formed therein and respectively communicating with the interior of the body and with the smoke-escape means, continuous down and up draft flues attached to the exterior of the body, one of the flues terminating adjacent to the opening communicating with the interior of the body, and the other flue connecting with the remaining opening which leads to the smoke-escape means, the lower portions of the flues having diverged smaller flues communicating therewith and projected over opposite sides of the stove-body and an inclosing open-work casing surrounding the body and flues fully from the top to the base of the stove.

8. A stove of the class set forth, having a body constituting a fire and heating chamber, and having openings at the upper portion communicating with the interior thereof, and continuous down and up draft flue means attached to the outer side of the body and terminally communicating with said openings and also with the smoke-escape means, the said down and up draft flue means being provided at their lower portions with diverging smaller flues projecting over opposite sides of the stove-body and depending close to the bottom of the stove.

9. In a stove of the class set forth, a body constituting a fire and heating chamber and having a top and a base support, the upper part of the body having diametrically-op-

posed openings communicating with the interior thereof, and continuous down and up draft flues consisting of upper main flues having their upper ends connecting with the said openings and one with the smoke-escape means, and lower oppositely-positioned smaller divergent flues communicating at their upper ends with the lower portions of the main flues, all of the said flues being applied to the exterior of the body and located at opposite points on the latter.

10. In a stove of the class set forth, the combination of a body constituting a fire and heating chamber, a top having a movable cover or feed-door and smoke-escape means, the upper part of the body having a flue-opening communicating therewith and also a diametrically opposite opening leading to the smoke-escape means, a continuous down and up draft flue means attached to the exterior of the body and comprising upper main flues communicating with the said openings of the body, and one of the flues with the smoke-escape means, and lower divergent smaller flues connected to the main flues and disposed on opposite sides of the stove-body, and a damper located within the body and adapted to be operated by the movement of the said top to establish communication between the interior of the stove-body and the smoke-escape means.

11. In a stove of the class set forth, the combination of a body having continuous down and up draft flues applied thereto and communicating therewith, a lid removably disposed in the upper end of one flue, a top and bottom for the body, the top having a feed-opening therein, and a cover for the feed-opening which also normally closes over the lid in the upper end of the one flue.

12. In a stove of the class set forth, the combination of a body having continuous down and up draft flues applied thereto and communicating therewith and with the smoke-flue means and merging into lower divergent smaller flues passing over opposite sides of the stove-body, a top for the body having a feed-opening provided with a lid or cover, and a bottom having a sectional ring applied therearound to diametrically extend the same, the lower portions of the divergent flues of the down and up draft flues resting against the bottom.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES M. MITCHELL.

Witnesses:

WILL C. VAWTER,
ALBERT L. COMSTOCK.