C. K. MARSHALL.

Heating Stove.

No. 79,844. Patented July 14, 1868.

Fig. 1.

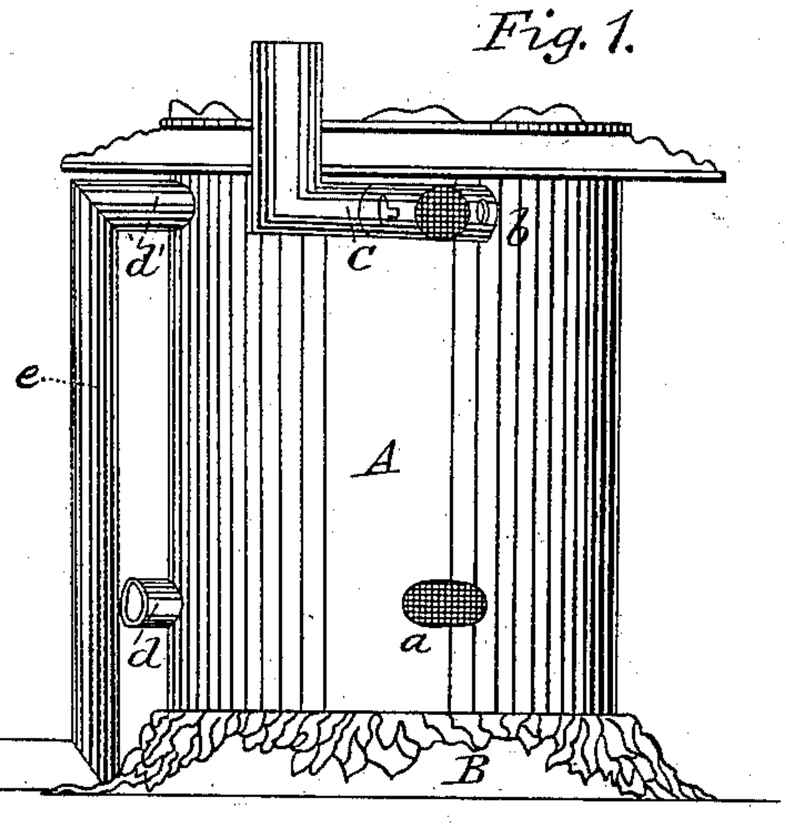


Fig. 2.

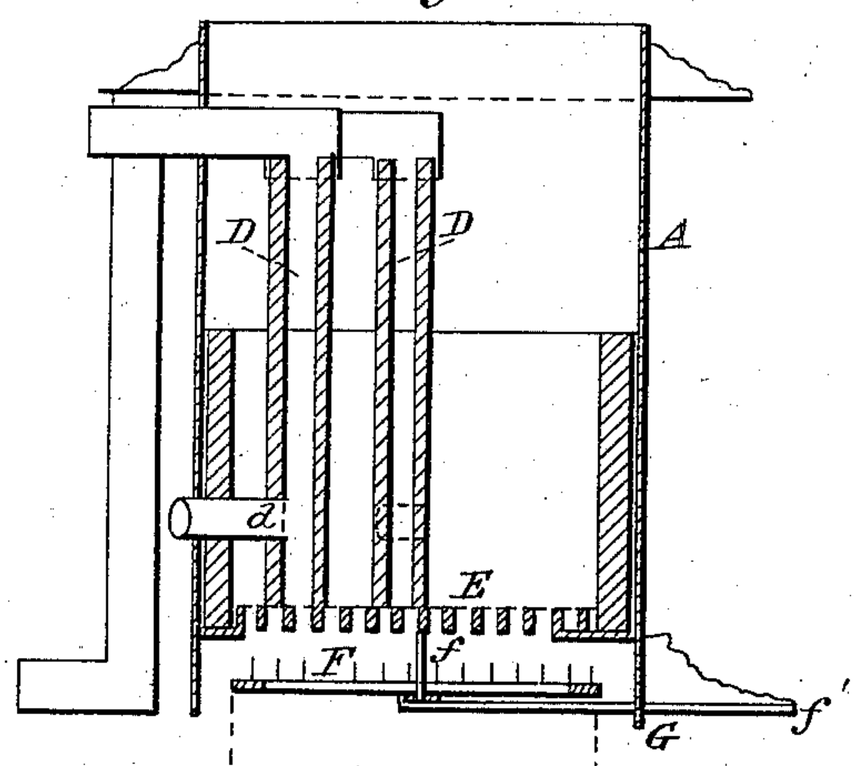


Fig. 3.

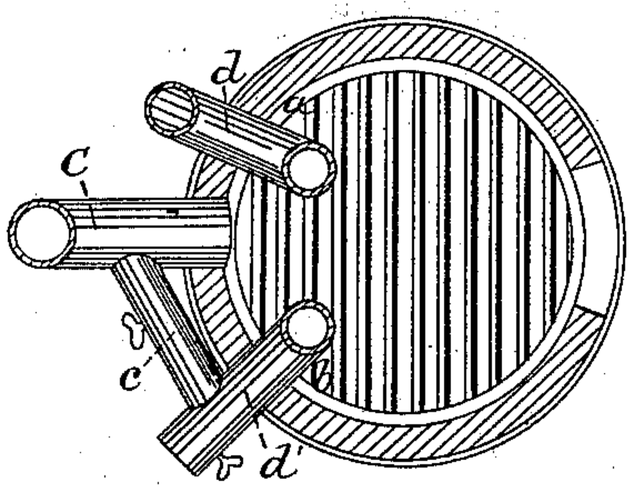


Fig. 4.

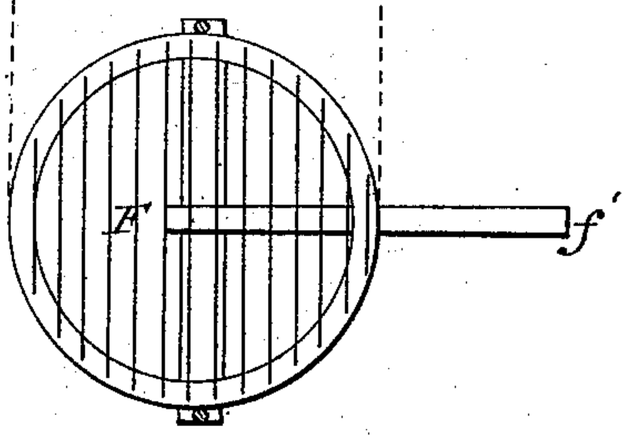
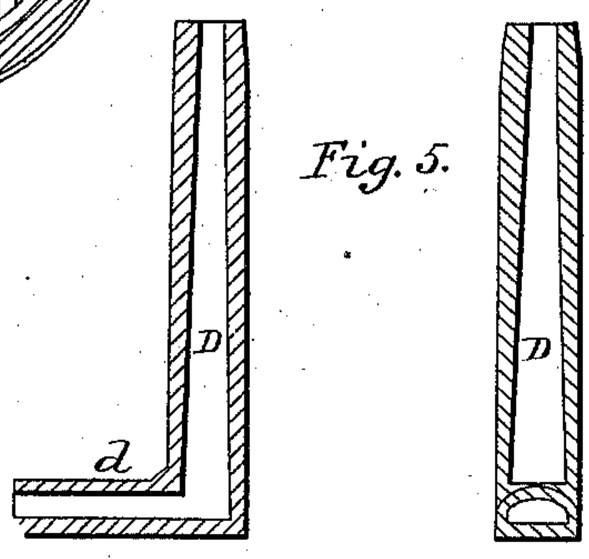


Fig. 5.



WITNESSES

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C. K. MARSHALL, OF NEW ORLEANS, LOUISIANA.

Letters Patent No. 79,844, *dated July* 14, 1868; *antedated July* 4, 1868.

IMPROVEMENT IN HOT-AIR FLUES IN STOVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, C. K. MARSHALL, of New Orleans, parish of Orleans, and State of Louisiana, have invented certain new and useful Improvements in Stoves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, and to the letters of reference marked thereon, and making part of this specification, and in which—

Figure 1 is a side view of a stove, showing the openings through which pass the elbow of the interior pipe.

Figure 2 is a sectional view, showing the internal arrangement of pipes.

Figure 3 is a plan view.

Figure 4 is a detached view of the supplemental grate.

Figure 5 are sectional views of the interior pipe, showing its tapering flue.

It it a well-known and admitted fact that, in all stoves now in general use, but a small portion of the heat caused by the combustion of the fuel is ever received into the room or apartment that it is desired to heat. Various reasons might be advanced by which, on philosophical principles, the cause might be assigned why this is so. Perhaps the most prominent cause is found in this fact: The opening for the pipe, which connects the stove with the chimney, is invariably placed in the upper portion of the stove, and, as heated air naturally ascends, the heat caused by the combustion of the fuel is necessarily thrown into the upper portion of the cylinder or drum of the stove, and, coming in contact with the opening for the pipe, a large portion of the warm air is borne through to the pipe, and escapes by the chimney-flue, while but a small portion of the heat is radiated from the stove to aid in warming the apartment. Various attempts have been made to remedy this evil, but they all, more or less, interfere with the freedom of the draught, which it is absolutely necessary should be left open and unobstructed, otherwise it is impossible that the fuel can be properly ignited, or kept burning with the required freedom.

The object of my invention consists in a simple and practical method whereby, by means of one or more pipes properly introduced and arranged in an ordinary stove, the heating properties of the same are more than doubled.

The nature of my invention consists in constructing a pipe of fire-clay, soapstone, or other equivalent material, said pipe being provided with two short elbows, extending at right angles therefrom, and which are intended to project through suitable openings arranged in the stove, one immediately above the grate, and the other in the upper portion of the stove. The lower elbow, which forms the base of the pipe, is intended to rest on the grate. Through this elbow, a constant current of fresh air is introduced from the apartment, and being heated in its transit through the main pipe, which is arranged sufficiently far from the side of the stove to allow of its being completely embedded in the burning fuel, is discharged by the upper elbow into the room.

In hall and other stoves of that class, which are provided with drums, the upper elbow, and consequently the upper opening in the stove, may be dispensed with, and the pipe be continued through a suitable aperture arranged in the top of the stove, causing the current of air to be conveyed immediately into the drum, from which it may be discharged, by means of appropriate registers, or other equivalent devices, at pleasure, or as the temperature of the room may require.

Another most important feature of my invention consists in constructing this interior pipe with a tapering flue, that is, one which is of much greater diameter or capacity at its base than at the point where the air is discharged. The great advantage of this tapering flue is this: the volume of air which is introduced is not permitted to rush through the pipe, as would be the case were the flue straight, and its sides perfectly parallel throughout their entire length. The volume is retarded sufficiently in its passage through the flue to insure the same being properly heated before being thrown into the apartment or discharged into the room.

My invention also consists in attaching, by means of suitable guide and bearing-rods, or equivalent devices, immediately below an ordinary grate, a supplemental grate. The bars of the lower or supplemental grate, instead of being round, are flat, and much deeper than are those of the ordinary grate now in general use.

The bars of the lower grate are so arranged that, when the same is worked by a lever or other suitable device, the bars of the lower enter between the bars of the upper grate, and thus, when the stove is raked, the entire mass of coal is agitated at one and the same time, and all the violent shock, which is so destructive to the inner tiling of the stove, when raked by any of the means now in general use, is entirely avoided.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is an ordinary stove, and rests on a suitable base, B. C is a flanged opening, to which the stove-pipe is attached. D is an interior pipe, and is made of fire-clay, soapstone, or other like material. *d* and *d'* are two elbows, extending at right angles from the pipe D, and pass out at suitable openings *a b* in the side of the stove.

The base of the elbow *d* is flattened, and rests on the grate. Through this elbow *d*, a constant current of fresh air is introduced to the pipe D, which being completely encircled by the burning fuel, or in a gas-stove, in immediate contact with the blaze, is thoroughly heated in its passage, and discharged into the room by means of the elbow *d'*. When the stove has a drum or upper chamber, the elbow *d'* may be dispensed with, and the pipe D continued through the top of the stove, causing the current of heated air to be poured into the drum or chamber, from which it can be conveyed to the apartment through the agency of the registers or other equivalent devices.

This elbow *d'* may be connected with the stove-pipe C by a short pipe, *c*, provided with a damper. The object of this pipe is to allow of the course of the heated air being changed, when the room becomes uncomfortably warm; instead of being thrown into the same, it can be caused to pass through the pipe *c* to the stove-pipe C, and thence escape through the chimney-flue.

The discharge-elbow *d'* may have attached to it an outer pipe, *e*, as shown in fig. 1, by means of which the heated air can be conveyed to a position near the floor, or to any other part of the apartment desired.

E is the grate, and is constructed in the usual manner. F is a supplemental grate, and has its bearing in suitable guide-rods *f f*, which are firmly secured to the bottom of the stove A. *f'* is a lever, attached to the supplemental grate F, and by which it is operated. G is an ash-pan, having a recess, *g*, and which serves as a fulcrum for the lever *f'* to work on.

The bars of the supplemental grate F are flat, and much deeper than are the bars of the ordinary grate. These bars are so arranged that they enter and work between the bars of the upper grate E.

By working the lever *f* with the foot or hand, the entire mass of fuel can readily and uniformly be raked at one and the same time.

It will be observed that the pipe D is shown in fig. 2 with a straight flue, the diameter of the upper and lower sections being the same; while in fig. 5 the pipe D is shown with a tapering flue, the diameter being much greater at its contact with the elbow *d*, through which the fresh air enters, than it is at its point of contact with the elbow *d'*, through which the heated air is discharged.

In some stoves, the straight flue will do, for instance, where the height of the stove is very great, but, in a majority of cases, practical experience demonstrates that the air enters through the elbow *d* with such force that, when the flue is straight, it rushes through the pipe D, and is discharged by the elbow *d'* with such rapidity that time has not been allowed the air in its passage to become thoroughly heated. This defect is entirely remedied by constructing the pipe D with a tapering flue.

The volume of air that is introduced by the elbow *d* does not pour in one continuous stream, but, in consequence of the fact that the capacity of the flue is much greater in its lower than in its upper section, the passage of the air is of necessity retarded longer than would be the case where the flue is straight and its sides parallel. This detention is sufficiently long to insure that the air will be properly heated when discharged at the mouth of the elbow *d'*.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent of the United States, is—

1. Constructing the pipe D of fire-clay, soapstone, or other like material, with a tapering flue, substantially as described, and for the purpose specified.

2. Constructing the stove A with openings *a b*, in combination with the pipe, having elbows *d* and *d'*, when the same are constructed of fire-clay, soapstone, or other like material, and arranged so as to operate substantially as described, and for the purpose specified.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

C. K. MARSHALL.

Witnesses:

JOHN D. BLOOR,

JOHN S. HOLLINGSHEAD.