

C. TRUESDALE.
Magazine Stoves.

No. 150,634.

Patented May 5, 1874.

FIG. 1.

FIG. 2.

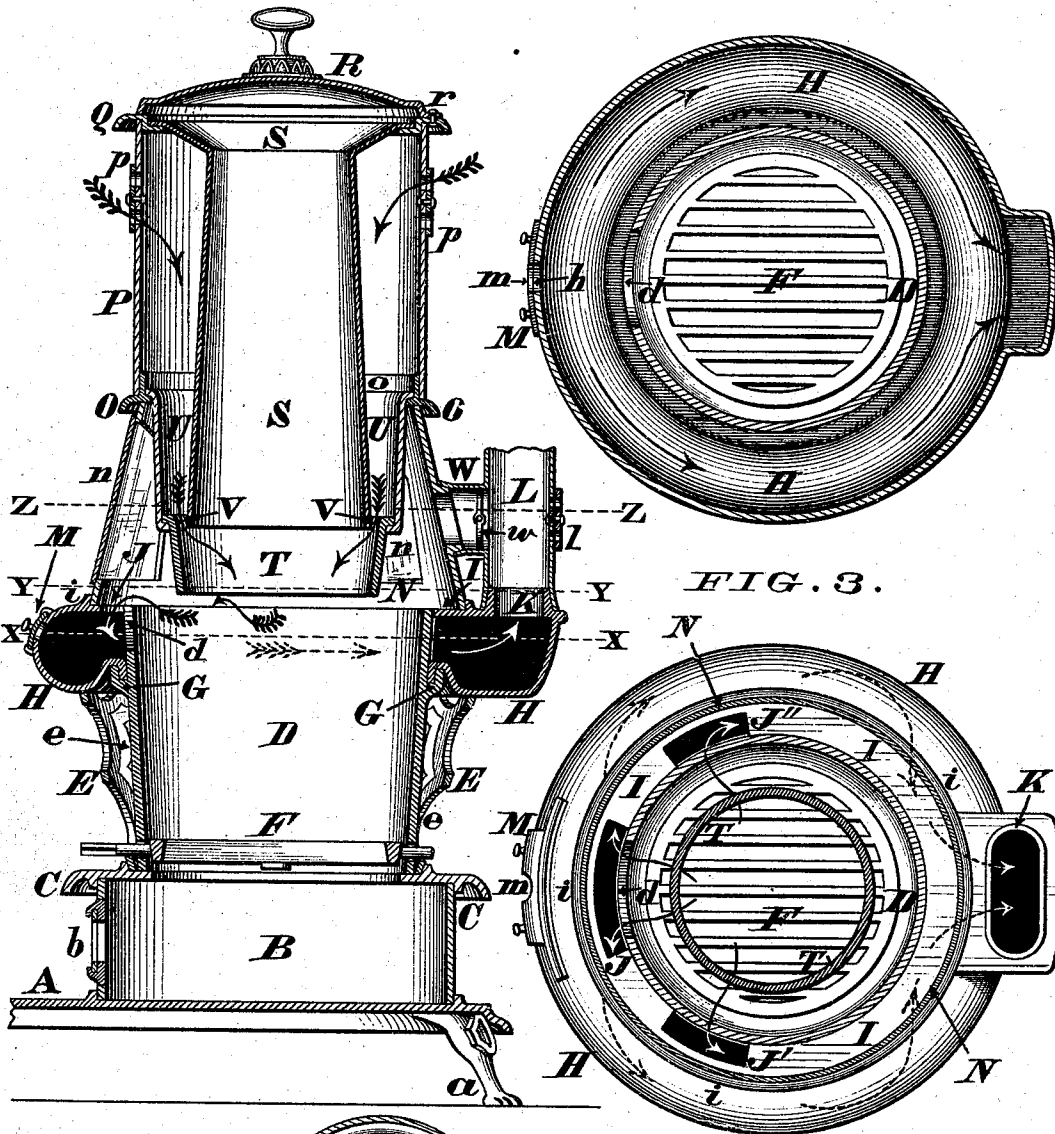
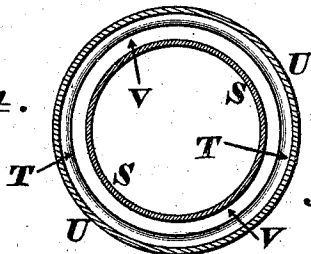


FIG. 4.



Attest.
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CHARLES TRUESDALE, OF CINCINNATI, OHIO.

IMPROVEMENT IN MAGAZINE-STOVES.

Specification forming part of Letters Patent No. **150,634**, dated May 5, 1874; application filed March 21, 1874.

To all whom it may concern:

Be it known that I, CHARLES TRUESDALE, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Magazine-Stove, of which the following is a specification:

This invention relates to that class of magazine-stoves which is designed more especially for consuming soft or bituminous coals; and the object of my improvement is to overcome one of the most serious and annoying objections to the use of such heating apparatus.

The defect alluded to is the heating of the magazine or receptacle that contains the coal, which latter soon becomes converted into coke, and expands and consolidates so much as to completely choke or clog up said magazine, and thereby render the stove inoperative.

Attempts have been made to overcome this difficulty, by drawing off the products of combustion at the top of the fire-pot and conducting them down to the base of the stove, and then allowing the smoke and unconsumed gases to escape into the exit-pipe.

This arrangement, however, is even more objectionable than the heating of the magazine, for the following reasons: In the first place, it exactly reverses the natural tendency of heated gases to ascend, and the descent of the products of combustion from the top of the stove to its base cannot be maintained unless the draft is very strong, and, therefore, in damp and heavy weather, such stoves are liable to smoke. Moreover, such circuitous passages, when employed for discharge of the smoke from bituminous coal, are liable to become choked by the deposition of soot. In the second place, this down-draft of the products of combustion necessitates an arrangement of the flues and jackets or shells around the fire-pot, and consequently there can be no direct radiation from the highly-heated sides of the aforesaid fire-pot.

It is therefore evident that if some plan could be devised to prevent heating the magazine, and at the same time to overcome these objections to the down-draft, a soft-coal stove would be produced that would soon become as popular as magazine-stoves for consuming hard coals.

My stove, which is the subject of this application, is arranged in such a manner as to

effectually obviate all these difficulties; and I accomplish this desirable result by a peculiarly-constructed flue, which carries off the products of combustion almost horizontally from the top of the fire-pot. This flue takes the shape of a hollow ring or annulus, that may be cast with the fire-pot, or in a single or in two or more separate pieces, and is constructed in such a manner as to receive the products of combustion at or near the front of the stove, when the fire and smoke are divided into two currents that flow around within said flue to the discharge-pipe, the latter being, preferably, situated diametrically opposite the receiving opening or openings of the annulus. The flue is arranged upon the stove as near the top of the fire-pot as practicable, and has the illuminating or mica section resting upon it, the receiving opening or openings of said flue being situated in a horizontal plane but a slight distance below the lower or discharging end of the magazine or its protecting shoe. By thus locating the flue as near the top of the fire-pot as practicable, the latter is exposed on all sides, and thereby becomes effective in radiating heat directly into the room in which the stove is situated, which result cannot be accomplished when the fire-pot is surrounded by a jacket or shell, as is usually done.

Having thus briefly indicated the prominent features of my improvement, I will now proceed to give a detailed description of the same.

Figure 1 is an axial section of a magazine-stove embodying my improvements, a portion of the hearth-plate being broken away and the "poker-hole" of the annular flue being shown closed. Fig. 2 is a horizontal section through the stove at the line X X, the poker-hole of the flue being open. Fig. 3 is another horizontal section at the line Y Y, and Fig. 4 is a section at the line Z Z.

A represents the hearth or base plate of the stove, which is supported upon feet *a*, in the usual manner. Resting upon this base is the ash-pit B, surmounted with a ring, C, that supports the fire-pot D, and also a perforated casting, E, which surrounds said fire-pot. The perforations or openings *e* in this casting may be of any desired ornamental shape or configuration, the object of said apertures being to allow the rays of heat to pass, with as

little obstruction as possible, from the fire-pot D directly into the room in which the stove is situated. This casting also serves as a screen to prevent anything coming in actual contact with the highly-heated fire-pot. F may represent any approved form of shaking and dumping grates.

Cast with or otherwise secured to the exterior of the fire-pot, and near the upper end of the same, is a collar or grooved ring, G, that supports and maintains in its proper position a hollow annular casting, H, which constitutes the flue proper of the stove. This flue may be cast with the fire-pot, or in one, two, or more sections, and should have an approximately-circular shape in its vertical section, so as to afford a symmetrical external appearance, while, at the same time, its internal construction is such as to present the least possible impediment to the passage of the products of combustion through it. Although this circular shape is preferred, yet said flue may be of any other approved form in its vertical section. The top of this flue is composed of a flat or horizontal plate, I, that is about flush with the upper end of the fire-pot, and said plate projects inwardly, so as to fit up snugly against the periphery of the member D of the stove. This plate is pierced with one or more slots or elongated openings, J J' J'', which may be of any suitable size and shape, the object of said openings being to allow the entrance of the products of combustion into the flue H. Located diametrically opposite the opening J is the collar K, to which an ordinary smoke-pipe, L, is applied, the latter being furnished with a register, *l*, for regulating the draft of the stove. The flue H is provided with a poker-hole, *h*, which can be exposed or concealed by properly shifting a perforated slide, M *m*, circumferentially of said flue. In order to allow the thorough stirring of the fuel in the fire-pot, the latter is notched or recessed at *d*. This recess permits the insertion of the poker within the fire-pot after the sliding shutter or scutcheon M has been shifted, so as to bring its perforation *m* in line with the hole *h* of the flue. A bead, molding, or flange, *i*, upon the exposed surface of plate I maintains in its proper position the illuminating-section N, which may be furnished with mica or other transparent windows *n*. Resting upon the aforesaid illuminating-section is a ring, O, around whose upturned flange *o* the jacket P is fitted, the latter being provided with one or more registers, *p*, wherewith to control the down-draft of the stove. Surmounting the jacket P is the cap or top plate Q, to which is pivoted or hinged at *r* the lid R, which, when swung aside or elevated, allows the magazine S to be filled with coal. This magazine depends from the cap Q, occupies an axial position within the stove, and is preferably larger at bottom than at top, as shown in Fig. 1.

By thus increasing the area of the magazine in proportion as it is projected downwardly, there is less tendency of the fuel to choke or

clog up within said receptacle than if the sides of the magazine were parallel or flared upward.

In order to form an air-passage and to prevent the lower portion of the magazine being burned out by the intense heat generated in the fire-pot, said magazine is protected by a heavy casting, constituting a downwardly-converging or funnel-formed shoe, T, which is suspended from a suitable bearer, U. The bearer is a cylindrical casting, somewhat wider at top than at bottom, and it depends from a flange or from lugs that project inwardly from the ring O.

When the various members S, T, and D are properly fitted within the stove, an annular passage or channel, V, is formed between the lower portion of the magazine and the upper part of the shoe T, through which passage the draft-air flows in the direction indicated by the descending arrows.

By referring to Fig. 1, it will be seen that the shoe T is somewhat less in diameter at bottom than at top, which construction is preferred, in order that the delivery end of said shoe may be about equal in area to the discharging end of the magazine, so as to insure a uniform flow of fuel through these two members of the stove, and so as to co-operate with the downward and inward direction of the vent-age V in projecting the draft downward into the center of the fire-pot.

In constructing this heating apparatus, care should be taken to avoid elevating the delivery end of shoe T too far above the top of fire-pot D; otherwise the fuel would have a tendency to flow down from the magazine S into the openings J J' J'', and thereby choke up the flue H, and the draft-air to escape over the rim of the fire-pot directly into the annular flue. It is therefore evident that the location of the shoe may be varied according to the kind of coal that is to be consumed; and when the stove is constructed especially for burning large lumps, two or three inches of space may intervene between the top of fire-pot D and the delivery end of said shoe.

When the stove is to be employed exclusively for burning slack coal or screenings, this intervening space may, in some cases, be reduced to half or three-quarters of an inch.

W is a branch pipe, which affords a communication between the main smoke-pipe L and the illuminating-section N *n*. A damper, *w*, regulates the flow or completely cuts off the passage of the products of combustion through the branch pipe W.

The ring G may be cast permanently to the exterior of the fire-pot D, or form a separate casting, secured by rivets or bolts, and said ring may be made in two or more segments.

The operation of my stove is as follows: A sufficient quantity of kindling is first laid upon the grate F, and coal poured into the stove until the fire-pot D is about full, after which the register *b* and damper *w* are opened, and the registers *lp* closed. The fire is then started

in the stove, the products of combustion escaping directly from the pot D, through branch pipe W, into the chimney L, and as soon as the contents of said pot have become thoroughly ignited the magazine S is then charged with coal, the register *b* and damper *w* closed, and the upper registers *p* opened. These manipulations exactly reverse the former actions of the stove, and the products of combustion, being no longer allowed to make a direct exit into the chimney L, are compelled to take the indirect course shown by the arrows in Figs. 1 and 3. By referring to these illustrations, it will be seen that the flame and smoke produced by the combustion of the fuel are first drawn into the openings J, to accomplish which they descend a distance of but one or two inches. After entering these apertures the products of combustion flow around through the flue H in two distinct currents to the exit K, and thence up the smoke-pipe L, the register *l* of the latter being adjusted so as to regulate the draft of the stove.

As the most active combustion occurs at the place where fresh coal from magazine S mingles with the incandescent fuel at top of pot D, and as this meeting-point is about on a level with the top of flue H, it will be seen that the fire, smoke, and unconsumed gases are dispersed and drawn off in a horizontal plane. By thus drawing off the products of combustion about in the same horizontal plane with the one in which said products are generated, the fire and smoke are not compelled to take a down draft toward the ash-pit of the stove, and I am thereby enabled to expose almost the entire surface of the pot D, the heat from which is radiated through the openings in the screen E directly into the room. This complete radiation of heat from the fire-pot cannot be obtained when said member of the stove is surrounded with a flue and shell, as is usually done; and as the hollow ring A also affords considerable radiating-surface, it will be seen that the heating capacity of my stove is considerably in excess of ordinary magazine-stoves.

It will be seen that the magazine S is at all times surrounded with cool air that flows in through the registers *p*.

The discharging end of shoe T being about equal in area to the delivery end of magazine S, the flow of coal down through these two

members is perfectly uniform, and consequently a regular fire is maintained in the stove, no matter how inferior the fuel may be. It is evident that the flue H may be located much nearer the plate C than is shown in the drawing; but the efficiency of the apparatus will be impaired in proportion as this lowering of said flue takes place, as the further it is carried down the less the amount of radiating-surface that can be exposed.

In the drawing but three openings, J J' J'', are shown, leading into the flue H; but a greater number can be employed, if preferred, and they may be circular, elliptical, or of any other suitable shape; or the central one, J, may be omitted, and the two side ones, J' J'', employed alone.

The illuminating-section N *n*, instead of being supported upon the flue H I, may rest on feet or brackets projecting from or attached to the pot D or other secure member of the stove. Whenever the shoe T becomes burnt out it can be readily removed and a new one substituted for it, to do which it is only necessary to lift out the magazines S and drop in a new shoe. A new bearer can be substituted for the one U in the same expeditious manner.

An inferior modification of my stove may be constructed by omitting the apertures J J' J'' in plate I, and piercing the fire-pot D with suitable perforations, so as to allow the products of combustion to enter the flue H in a perfectly direct or horizontal manner. It is evident, however, that such an arrangement of perforations would conceal all the flames arising from the combustion of the fuel, and on this account the stove would have a very cheerless appearance, and the illuminating-section N would be superfluous.

I claim as my invention—

In a magazine-stove, the external flue H, surrounding and contiguous to the upper margin of the fire-pot, having one or more inlets, J, remote from the exit K, substantially at the level of said margin, as and for the purposes set forth.

In testimony of which invention I hereunto set my hand.

CHARLES TRUESDALE.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.