D. C. PROCTOR.

COAL-STOVE.

No. 176,999. Patented May 2, 1876.

Fig. 1.

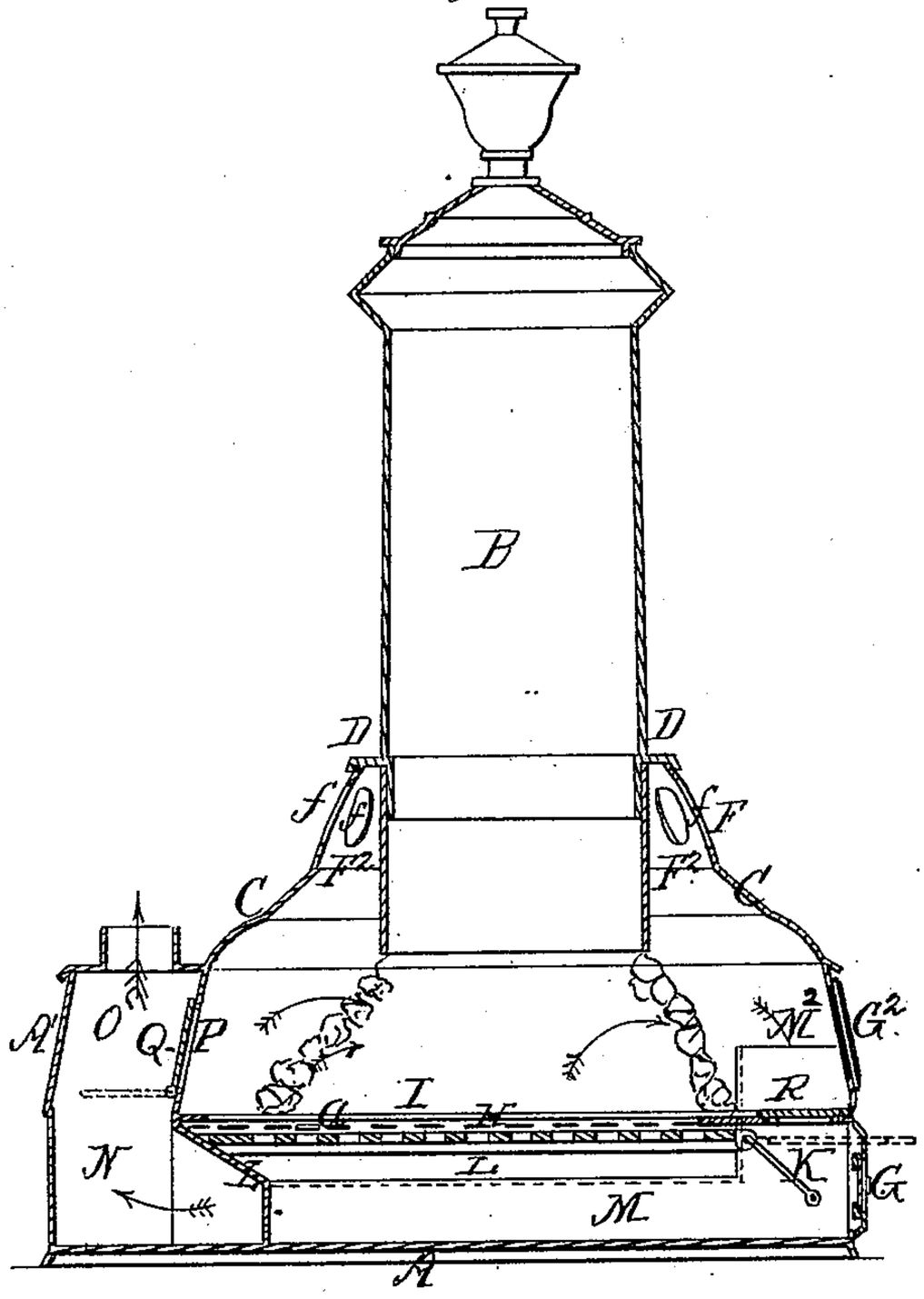


Fig. 2.

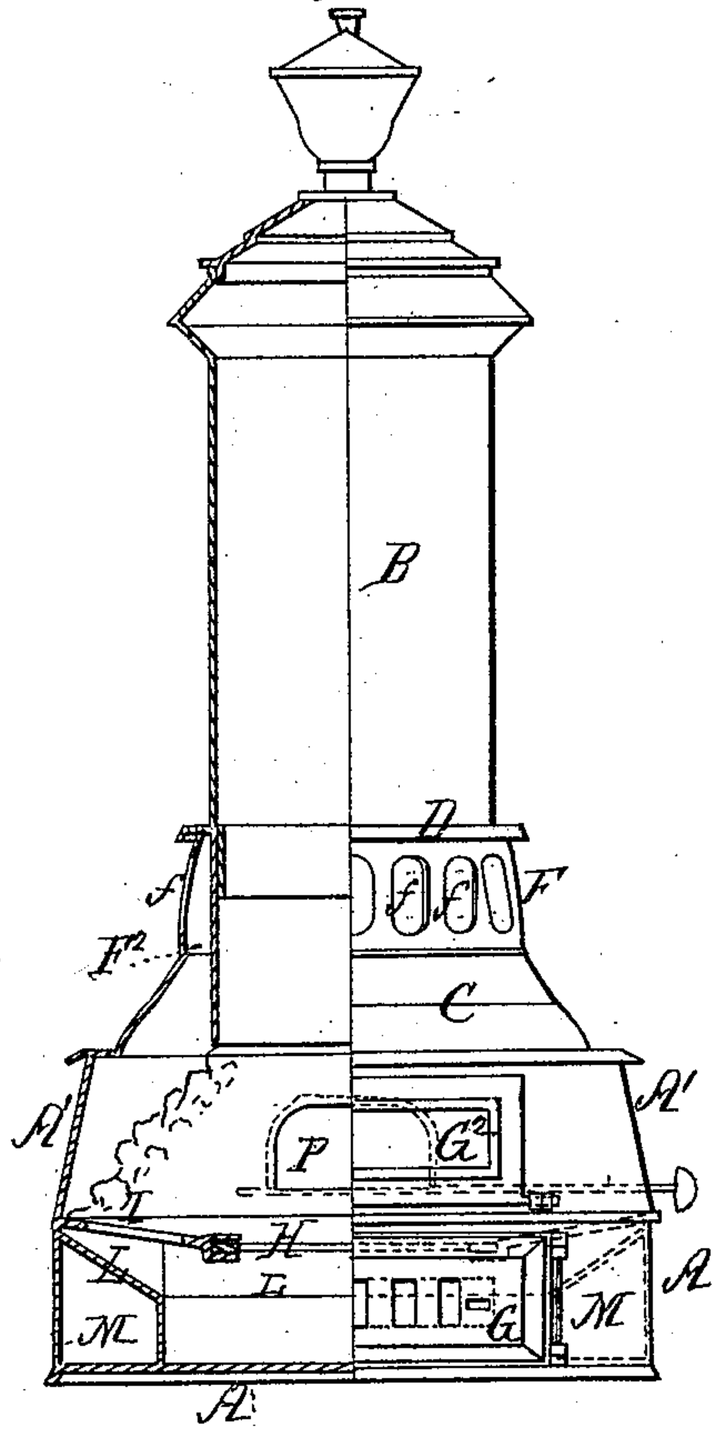


Fig. 3.

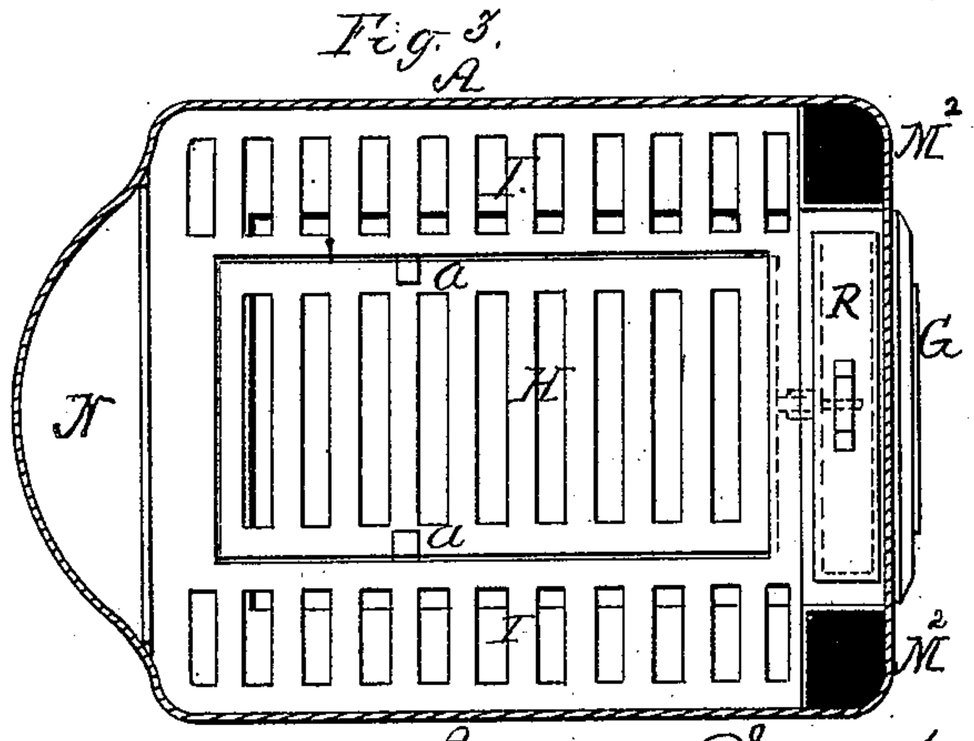


Fig. 5.

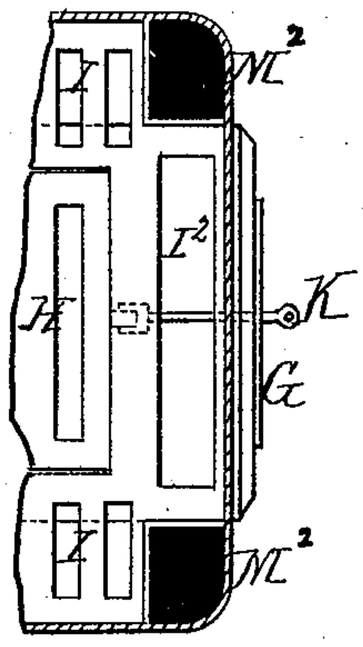


Fig. 6.

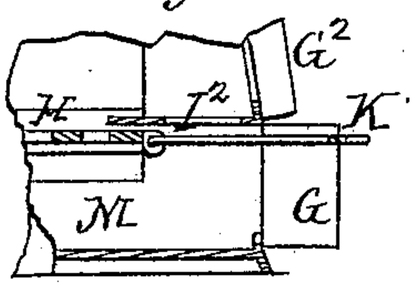
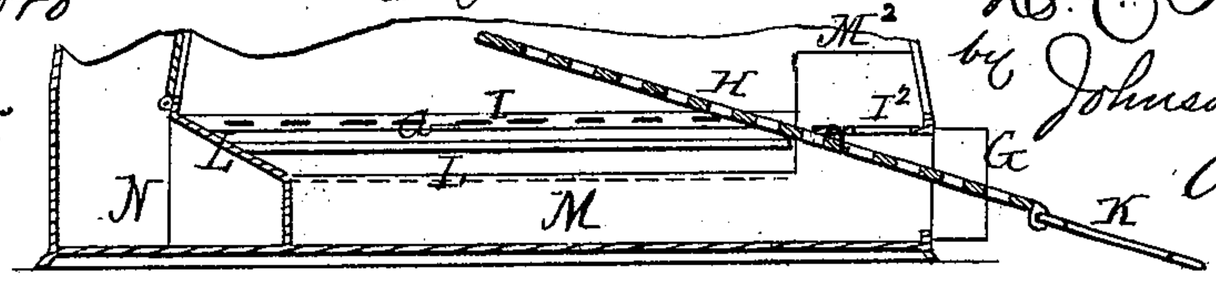


Fig. 4.



Witnesses:
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J. West Wagner.

Inventor:
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by Johnson and Johnson,
Attys.

UNITED STATES PATENT OFFICE.

DAVID C. PROCTOR, OF PEORIA, ILLINOIS.

IMPROVEMENT IN COAL-STOVES.

Specification forming part of Letters Patent No. **176,999**, dated May 2, 1876; application filed March 4, 1876.

To all whom it may concern:

Be it known that I, DAVID C. PROCTOR, of Peoria, in the county of Peoria and State of Illinois, have invented new and useful Improvements in Coal-Stoves, of which the following is a specification:

My improvements relate particularly to that class of coal-stoves in which the fuel is stored in a magazine located above the fire-chamber, and fed therefrom to the fire by force of gravity as fast as consumed; and it consists in certain novel features of construction, combination, and arrangement, hereinafter more fully described and explained, whereby I am enabled to adapt the stove for burning hard as well as soft coal, in which, however, the advantages of burning soft coal are the greatest, for with this coal great difficulty has been experienced in preventing it from burning up in the magazine, as it becomes coked, and will not feed down. This is due to the construction of stoves in which the draft is generally upward and around the magazine, or in which the draft is taken out at so high a point that the coal in the magazine becomes heated, and expands to such a degree as to prevent any feed, and, the coal becoming coked, all the combustion possible is in the magazine, and the results are unsatisfactory.

It is to avoid these difficulties that I have devised the broad flat-surface grate in connection with the down-draft flues, the effect of which is a comparatively cool magazine at all times, within a few inches of the fire, the heat being taken directly away from the magazine, and at the same time carried around in such manner as will render it effective, as the draft is taken out on a line with the fire, and is not permitted to ascend, but is held down to near the floor until most of the heat is exhausted, and making a base-burner as well as a base-heater, reference being had in the description to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation taken through the middle of a stove embodying my improvements; Fig. 2, a partial transverse section, showing the arrangement of the base-flues and the grate; Fig. 3, a horizontal section taken above the grate; Fig. 4, a vertical section, showing the manner of dumping the grate by partially withdrawing it; Fig. 5, a detail, showing the front opening, through which the cinders, &c., are raked from the grate without withdrawing the latter; and Fig. 6, a section of the same.

A A is the main body or stove proper; B, the magazine, of cylindrical, oval, or other suitable form, superimposed thereon and communicating freely therewith. This magazine is of simple construction, consisting, essentially, of an upright hollow barrel of cast or heavy sheet metal, closed at the top, so as to completely cut off the air, and thus preclude combustion of the contained fuel. For this purpose the ordinary sliding valve and laterally-swinging top (surmounted with a vessel for water, or an appropriate ornament) may be used. The lower portion of cylinder B extends to within a proper distance of the surface, upon which is delivered the fuel fed to the fire. The cylinder B is supported upon the top C of the stove by a ring or flange, D, cast in one piece with, or otherwise rigidly secured upon, the barrel B, and projecting outwardly therefrom, and resting upon a base, F, projecting upwardly from and rigidly secured to the top C, and of greater diameter than the barrel, to which it corresponds in form, to make the space F^2 between it and the cylinder. This base F has formed in it numerous openings, *f f*, for receiving panes of mica or isinglass, commonly so called. This series of openings extends completely around the base F, and the light of the fire within, coming up into the space F^2 between the lower portion of the barrel B and the base F, adds to the cheerful and attractive appearance of the stove, and serves to indicate the condition of the fire.

The base A I prefer to make of a square or oblong form, and it is of much greater area horizontally than the barrel or magazine B. With the view, however, of preventing the heat from coming in contact with the magazine, I make the portion A′ above the plane of the grate of an upwardly receding or tapering form, and the top C also to rise from the edges inwardly to the base F of the barrel or magazine, and may be formed with appropriate ornaments, to improve its appearance and extend the radiating-surface.

G is the door of the ash-pit, formed in its base, at one end thereof, below the plane of

the grate H, while the upper draft G^2 is above the door and the plane of the grate. The lower draft may be made in any manner that will suit the purpose.

The grate is made in three sections, H I I, the middle one being made removable, and sliding longitudinally in guides or grooves, and capable of being shaken in that line, to separate ashes and clinkers, and provided for this purpose with a link, K, accessible through the door, or which may project through the door, and the grate be drawn out far enough to be dumped.

As the section H, or grate proper, runs from end to end of the stove, its motion causes fresh coal to descend upon the fire, and spreads the fire over the whole surface of the grate; but it can be removed without difficulty, and cleaned of adhering products of combustion, by drawing it out wholly or dumping it forward.

The side sections I I need not be removable. They may, however, be so constructed, if preferred, but do not receive any shaking motion to clear them, as they are of small area, and the coal resting thereon will be sufficiently disturbed by the shaking of grate H. The ashes and other matters which fall through the bars of the sections I I fall upon the inclined sheds L L of the base-flues M, now to be described.

In order that as much of the heat as possible may be conducted away from the smoke, gases, &c., arising from the burning fuel, and radiated through the outer walls of the stove, and thus utilized, I form upon the interior of the base, at each side thereof, and in the angle formed by the walls and bottom, a base-flue, M, formed at the end next the forward end of the stove with an upright section or diving-flue, M^2, reaching a suitable distance above the plane of the grate H I I, and fire thereon, and communicating at the other with the chamber N, whence the currents ascend through the flue O. This chamber also communicates directly with the fire-chamber, through an opening, P, in the rear partition-wall, which is adjusted by means of a damper, Q, to be opened when direct draft is needed.

When the fire is burning well, the damper may be closed and the current directed through the diving-flues, the external walls receiving heat from it during its passage, and radiating it to the air of the apartment in which the stove is placed. This is of much importance.

In rooms heated by base-burning stoves in general the lower stratum of air, for a foot or more above the floor, tends to remain cold. The tendency of heated currents of air to rise prevents the displacement of this cold stratum. The base of the stove itself remains cold, except when the fire is at its height. An arrangement of devices for deflecting the currents to the base not only extends the radiating-surface thereof, and consequently its economy in the consumption of fuel, but heats the lower portion of the room, preventing dampness, and permitting the occupants to conveniently warm their feet.

At the forward end of the stove, within convenient reach of the hand, is an opening, I^2, formed in a fixed front portion of the grate, closed by a removable lid, R, for permitting the convenient removal of coal, clinkers, stones, and other matters, and so arranged as not to interfere with the reciprocation or removal of the grate H. A removable drawer (not shown) in the base of the stove, between the base-flues, receives the ashes and cinders.

The advantages of my invention are the simplicity and convenience of the devices for producing at will the direct and indirect draft, the heat being generated and retained near the floor until it passes into the pipe, and of the arrangement of the removable grate H and removable lid R, for permitting the easy cleaning out of the stove when necessary. The use of a fire-pot is, moreover, dispensed with, as I design it more particularly for the consumption of soft coal.

In Fig. 4 is shown the method of dumping the grate, to effect which, it will be seen, the cover R is removed from its position in front of the grate, and the latter drawn forward through the lower doorway sufficient to clear the guide-plate *a*, when it is tilted down in the opening at the front, and brings the cinders in line with the openings I^2, formed at the front, in line and on a level with the grate H, in which position the grate forms an upward incline from this opening, and the cinders and ashes are raked from the grate and fall through such opening. This clearing of the grate is effected through the upper door G^2 by means of a rod or scraper. Generally, however, it is only necessary to clean the grate by shaking it, and then drawing the cinders and ashes over the grate to the front opening, and in which case the grate is not drawn out beneath said opening; but the grate may be withdrawn from its guideways through the front door, if desired, and when so withdrawn the side grates can be readily cleaned into the ash-pan.

The long side grates I I incline to their junction with the long middle grate H.

The specific construction of the grate herein described forms the subject of a separate patent to me, bearing even date herewith.

I claim—

1. The combination of the oblong base A, provided with a grate of fixed and movable sections, of length and width equal to the base, with the top C, base F, and the magazine B, constructed and arranged substantially as herein set forth.

2. The base F, secured upon the top C, and serving as a support for the barrel or magazine B, said base F being made of greater diameter than the magazine, and having between it and the magazine the space F^2, and provided with the window-lights *f f*, and combined with the oblong broad grate H I I, substantially as and for the purpose set forth.

3. The combination, with the base A, provided with an elevated longitudinally-reciprocating grate, H, and fixed side grates I, of the side base-flues M, immediately beneath the side grates, and having their diving ends M^2 above the plane of the grate, substantially as herein set forth.

4. The combination, with the front-side diving-flue M^2 and the rear direct-draft opening P, both arranged above the grate, with the magazine arranged between and above these direct and indirect draft openings, as herein set forth.

5. The combination, with a longitudinally-reciprocating grate, H, and the opening I^2 in front of and in line therewith, of the front door G, as and for the purpose set forth.

In testimony whereof I have affixed my signature in the presence of two witnesses.

DAVID C. PROCTOR.

Witnesses:
JNO. E. HUNTER,
FRANK F. PROCTOR.