

117006

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Improvement in Stoves.

PATENTED JUL 11 1871

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Fig. 1.

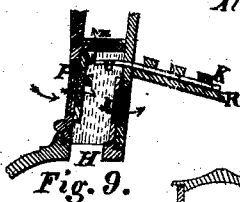
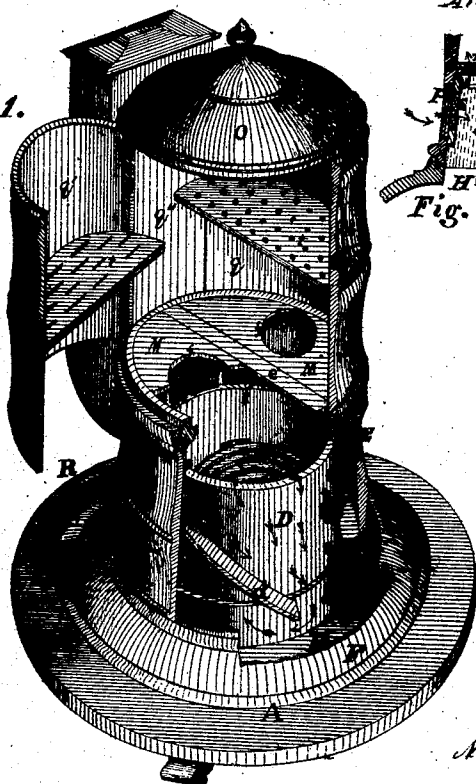


Fig. 2.

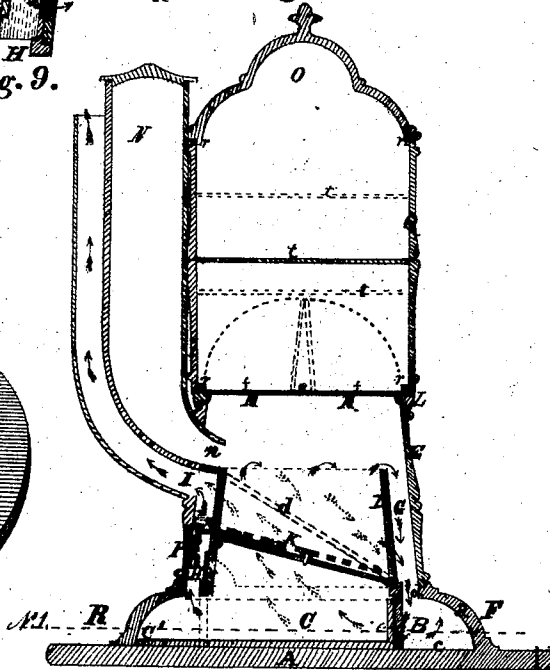


Fig. 3.

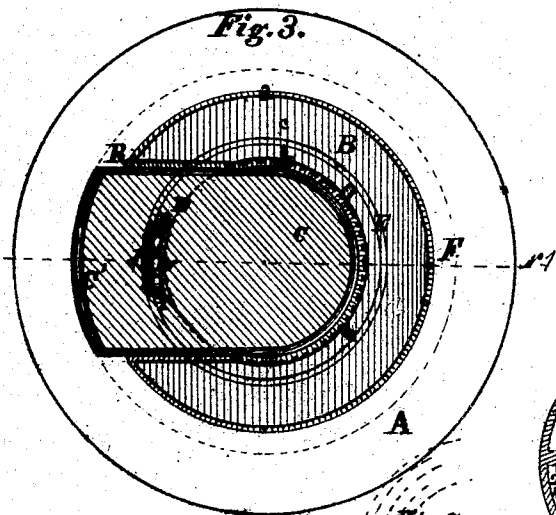


Fig. 4.

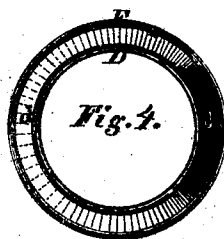


Fig. 5.

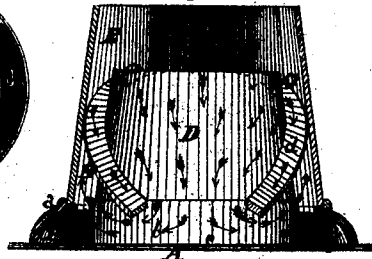


Fig. 6.

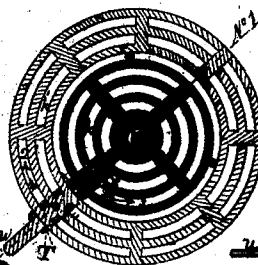


Fig. 8.



Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

DAVID SMITH, OF ALBANY, NEW YORK.

IMPROVEMENT IN BASE-BURNING STOVES.

Specification forming part of Letters Patent No. 117,006, dated July 11, 1871.

To all whom it may concern:

Be it known that I, DAVID SMITH, of the city and county of Albany, State of New York, have invented certain new and useful Improvements in Stoves; and I do hereby declare that the following is a description thereof, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 represents a perspective view of a stove with parts broken away, and illustrating the principal parts of this invention. Fig. 2 is a side elevation of the stove, as improved, through line No. 1, Fig. 3. Fig. 3 is a vertical view of the stove at line No. 1, Fig. 2. Fig. 4 is a vertical view from above of the fire-pot and outer cylinder. Fig. 5 is a perspective view of the fire-box and wall of the ash-pit, as they stand within the outer cylinder and the base. Fig. 6 is a vertical view of the grate from above, on an enlarged scale. Fig. 7 is a cross-section of the grate through line No. 1, Fig. 6, on scale as Fig. 6. Fig. 8 is a vertical view of the operating lever of the grate and sections of grate in dotted lines. Fig. 9 is a sectional view of draught-door and dampers, and a section of the rear of the stove, on an enlarged scale.

Several parts of this invention relate to certain means whereby the front and the sides of the stove are made to be effective to heat or warm the main body of the room in front and at the sides of the stove, while that portion of the room back of the stove and between the wall or fire-place and the stove will not be as greatly heated as with stoves heretofore constructed; while other parts of this invention relate to certain improvements by which certain conveniences are secured, which are most desirable and also will enable a housekeeper to economize both fuel and labor in the management and attention to the same.

To enable others skilled in the art to make and use my invention, I will proceed to describe it in reference to the drawing and the letters of reference marked thereon, the same letters indicating like or similar parts.

In the drawing, A represents the base of a stove, into which base A I make the flue B, Figs. 1, 2, 3, and 5. The said flue B, if the stove be of round or oval form, I make horseshoe-shape, as in Fig. 3, or if the stove be of square or angular form I would make the said flue in form to

correspond with such forms, and in all cases I would have the mid-part of the said flue B to be in the front of the stove at F, as in Figs. 1 and 3, while the ends of the said flue would terminate back near in a line with the rear R of the stove. The said flue B is formed by the sloping wall *a* of the base, and the wall *b* which surrounds the ash-pit C, and the bottom-plate *c*, as shown in Figs. 1, 2, 3, and 5. The object of thus forming and locating the said flue B is to bring the said flue so as to face the room-front of the stove, so that the heat radiated from the said flue will heat the principal and larger part of the room instead of that portion of the room back of the stove and between it and the wall or fire-place, as is done in stoves, as heretofore constructed, with annular or base flues. C is the ash-pit, made in any of the usual forms, and is constructed to receive from the rear R of the stove the ash-pan C', which is inserted and withdrawn from the said rear of the stove, as shown in Figs. 1, 2, and 3, the object of thus constructing the said ash-pit C being to secure a cut-off or a termination of the flue B before it reaches the rear R, and thus prevent any excessive heating of the back of the said ash-draw, and also to transfer the place for the removal of the ashes and using of the material for kindling a fire from the front of the stove (which is most conspicuous) to the rear (which is most obscure.) D is the fire-box or pot, which I prefer to make of larger diameter at its base than its top, which fire-pot I set over the wall *b* surrounding the ash-pit C, as shown in Figs. 1, 2, 3, and 5. The said fire-pot I inclose with an outer cylinder, E, of a form on its inner side to correspond with the outer side of the fire-pot D. The said cylinder E is supported by the sloping wall *a*, and is of such a diameter as will insure a space between it, the cylinder E, and the fire-pot D—say of about one and one-half inch (more or less) in width. Between the said fire-pot D and the said cylinder E, and filling the said space, I place a diaphragm or division-plate, *d*, which encircles both sides of the fire-pot and the back of the same, and, commencing at the top of the said fire-pot and at its back, inclines downward to the base of the same, as shown in Figs. 1, 4, and 5, and by dotted lines in Fig. 2, until its ends terminate into or at the opening *d'*, Figs. 2 and 4, communicating with the flue B. The said divis-

ion-plate *d* is to correspond in form to the form of the fire-pot and the outer cylinder, whether they be round, square, or of other form, and may be either cast to the fire-pot or to the outer cylinder, or may be a separate plate laid between and secured in a workmanlike manner. When thus placed the said division-plate *d* forms, between the fire-pot and the outer cylinder, two chambers or flues, *G* and *H*. The flue *G*, commencing largest at the top of the fire-pot, having the whole area of the space between the said fire-pot and outer cylinder, contracts as it approaches the opening *d'* communicating with the flue *B*, while the flue *H* will be the reverse, having a greater area of space below at the flue *B* and a more contracted area above at its opening into the pipe *I*; the object of this part of my invention being to give a direction to the draught, as indicated by arrows in Figs. 1, 2, and 5, that will tend to concentrate toward the front the whole products of the combustion until the said products reach the flue *B*, and thus increase the heat in the front of the stove, when the draught will be divided and will pass back and up the sides, as shown by arrows, to its exit into the pipe *I*, thus enabling the main portion of the room in front of the stove to be better warmed and the portion back less heated than with stoves as now constructed. I also place the grate *K* in an inclined position, as shown in Figs. 1 and 2, in which the back part of the said grate will be elevated above a line with its front part; the object of this part of my invention being to secure opportunity for a greater body of fuel on the front of the grate than on the back of the same, and thus insure a greater combustion of fuel in the front of the fire-box than in its rear, whereby the room in front of the stove will by radiation be more warmed than that portion back of the same. On the top of the cylinder *E* I place a ring, *L*, Figs. 1 and 2, which ring can be revolved on the top of the said cylinder. To the said ring *L*, I make a cross-bar, *e*, with which bar *I* hinge (preferred) or otherwise connect the plates *M*, which plates are furnished with pot-holes *f f*. If the said plates *M* are hinged they can be thrown up, as in Fig. 2, or if they are permitted to rest on flanges they may be lifted off when desired, when the heat by radiation will rise up into the upper drum of the stove; the object of this part of my invention being to combine accommodations for cooking with a parlor or office-stove, which will at the same time not interfere with the warming of the room. *N* is a reservoir, of any suitable form, for fuel, which reservoir I place at the rear of the stove and out of a vertical line with the fire-pot *D*. The said reservoir feeds into the fire-pot *D* from a sloping bottom *n*, Figs. 1 and 2. To the top of the said reservoir I attach securely a projecting cover or dome, *O*, in such a manner that the said dome will stand over the ring *L* supporting the plates *M*, as shown in Figs. 1 and 2; the object of thus placing the reservoir and combining with it the said dome *O* being to secure an unobstructed radiation of the heat upward into the drum above when the plates *M* are thrown up or removed, and also to give per-

mission for the proper attachment of the upper drum *Q* and the operation of its parts, to be hereafter described. *I* is the smoke-flue or pipe which communicates to the chamber or flue *H* just below the top of the rear of the division-plate *d'*. The said flue can have given to it any form or direction that may be desired and the usual pipes connecting may be attached to the said flue either in a vertical direction or at any angle.

I make in the rear of the stove, above the ashpan *C'*, and into the outer cylinder *E*, a door, *P*, Figs. 2, 3, and 9, to communicate with the space between the fire-pot and the said cylinder. By means of the said door *P* access is given to the handle *u* for operating the grate *K*. The door *P* is provided with a damper, *S*, which can be opened to admit air within the stove, or closed to cut off the supply of the same. An opening is also made in the rear of the fire-pot *D*, below the grate, and provided with a damper, *V*, Fig. 9, which damper, when opened, (together with the damper *S*), will admit air to the fire-box from beneath; the object of this part of my invention being to admit air into the stove from the rear of the same, that the air used for combustion will not be drawn directly from that portion of the room in front of the stove, but will draw from that portion of the room back of the stove and tend to promote a lower temperature at that part of the room, and not materially reduce the temperature of the room front of the stove, and thus produce results quite contrary to those produced by front-draught stoves. The sides of the door *P*, within the outer cylinder *E*, are cased to the fire-box *D* by the casing *Z' Z'*, Figs. 3 and 9, and a third damper, *Z*, is placed above the door *P*, between the outer cylinder and the fire-pot, and communicates with the chamber *H* and flue *I*, which damper *Z*, when opened, will permit a passage of the air into the said chamber *H* and flue *I*. When the damper *S* in the door *P* is opened, and the dampers *V* and *Z* are also opened, air will be admitted into both the fire-pot and the chamber *H* and flue *I*, while the closing of the damper *Z* will cause all the air to pass through the fire-pot, and the closing of the damper *V* and opening of the damper *Z* will cause the draught to be wholly into the chamber *H* and flue *I*; the object of this part of my invention being to afford means for regulating the supply of air for combustion to the fire-box, and also to the flue *I* and chamber *H*, to check or damp the fire, as may be desired. The cylinder or drum *Q* of this stove is formed of sections *q* and *q'*, which are hinged to a fixed section, *q''*, (or may be hinged to the back of the reservoir *N*), in any proper manner. The said sections *q* and *q'* are to be made in form to correspond with the form of the dome *O* and the ring *L* so as to close nicely on the projecting rims *r* of the same, as in Fig. 2. In the said sections *q* and *q'* I place shelves *t*, one or more in each, which shelves I prefer to be perforated, as shown in Fig. 1, (though they may be made tight;) plates perforated to correspond may be placed over the said shelves and be used as dampers for such perforated shelves when

desired; the object of this part of my invention being that, while opportunity is afforded for cooking on the plates M below, the drum Q may have accommodations for cooking, baking, or warming food or articles in the said drum, as may be required; and also, when the plates M are thrown up (as in dotted lines in Fig. 2) to heat the said drum, that it may aid to warm those portions of the room front of the stove, and also on the sides of the same by radiation. The same results could be secured by a drum, Q, made continuous, instead of in sections q q' q'' , and hinging the same to one side or corner of the reservoir L, and providing it with shelves t and doors to communicate within for the same purpose. Such a drum, so constructed and arranged, would be an equivalent, as a continuous drum could be turned out from over the plates M when it was desired to use the said plates for cooking. The grate K I construct circular and in two or more concentric groups of connected rings or bars, as groups k and k' in Figs. 6 and 7. When made with two such groups, as k and k' , the central group k is pivoted to the roller-bar R. On one portion of the said roller-bar I lay a lever, T, Figs. 6, 7, and 8, which lever is pivoted to the roller-bar near midway between its ends, (the lever,) as at x . The group k is provided at some point with a pin, x' , which passes down and works into the crotch y of one end of the lever T, Fig. 8, while the group k' encircling the group k is provided with a pin, x'' , at some suitable point, which pin x'' passes down into the crotch y' . A handle, u , is cast on or made to the outer group k' , by which the grate is to be operated. When the handle u is moved in the direction indicated by arrow 1, Fig. 6, the outer group k' will be moved in the same direction as arrow 2, while the inner group will be revolved in the opposite direction, as indicated by arrow 3. A reverse movement of the handle u will operate the several parts in reverse directions. Two or more such concentric groups can be used, and each additional group would require an additional lever similar to the lever T, arranged to operate each two immediate groups of the number used. When the pin x' operating in the crotch y of the lever T is placed at a greater distance from the pivot x than the pin x'' of the group k' , the group k , when operated, would have a greater throw round than the outer group k' , and would operate more effectually to work out the ashes and cinders which accumulate over the grate; the object of this part of my invention being to secure reverse movements of the several groups forming the grate, which

movements would be simultaneous, and would be more effective to disturb the ashes and cinders, and tend to grind them out to below the grate.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a stove, the flue B constructed and arranged within the base A in front, and terminating at the sides of the ash-pit C at the rear, substantially as and for the purpose set forth.

2. In a stove, giving entrance to the ash-pit C from the rear of the same, substantially as and for the purposes set forth.

3. In a stove, the flue G running obliquely from the rear and top of the fire-box D to the bottom and front of the same, and converging in the opening d' communicating with the flue B, substantially as and for the purpose set forth.

4. In a stove, the sloping division-plate d , when placed between the cylinder E and fire-box D in a manner to produce the chambers or flues G and H, having reverse directions of draught to and from the front of the stove, substantially as and for the purpose set forth.

5. Giving the grate K an inclination in the fire-pot from an elevated point back to a depressed point front, substantially in the manner set forth, for the purpose specified.

6. The plates M, in combination with the ring L, and both in combination with the cylinder E, substantially as and for the purpose set forth.

7. The combination of the dome O with the reservoir N, when arranged substantially as and for the purpose set forth.

8. Feeding air from the rear of the stove to the under side of the grate K, substantially in the manner and for the purpose set forth.

9. The dampers s , v , and z' , in combination with the door P, when arranged substantially as and for the purpose set forth.

10. Constructing the drum Q in sections q , q' , and q'' , or in an equivalent manner, whereby the said drum may be turned from over the plates M, substantially as and for the purpose set forth.

11. In combination with the drum Q, constructed as described, the shelves t , substantially as and for the purpose set forth.

12. Operating two or more concentric groups of rings or bars in a grate, K, in opposite directions to each other by means of the lever T operating the several groups k k' , substantially as and for the purpose set forth.

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Witnesses:

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