Sept. 26, 1939. D. B. CARD 2,174,347

STOVE

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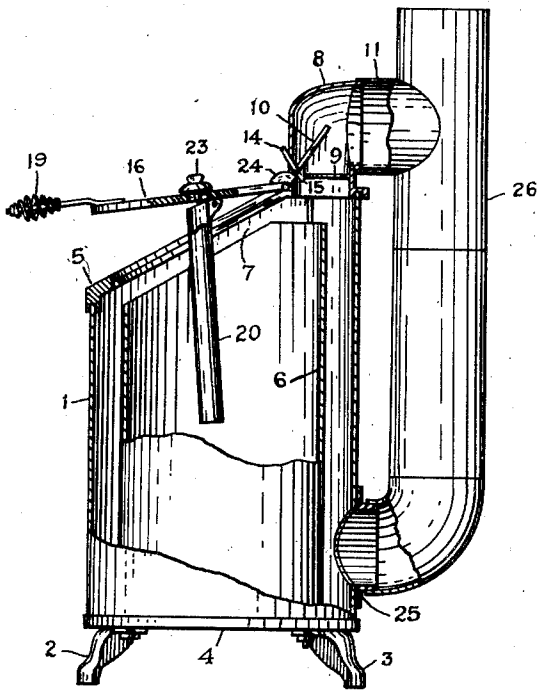
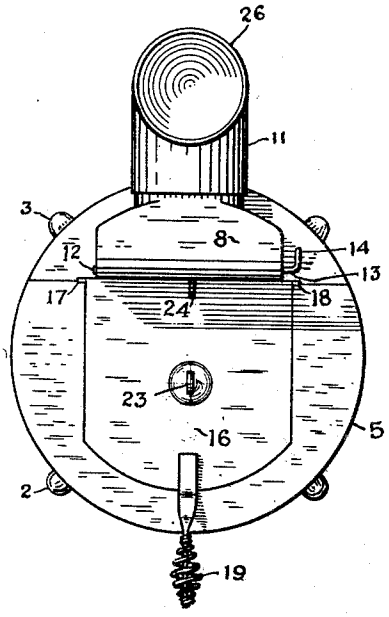


Fig. 1.

Fig. 2.



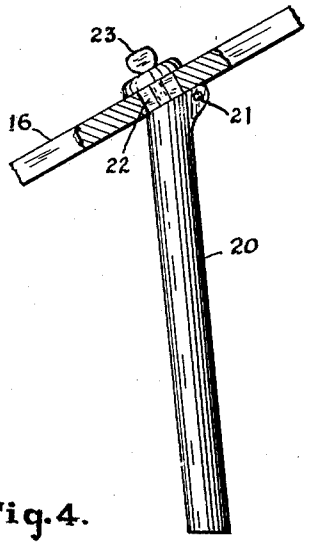


Fig. 4.

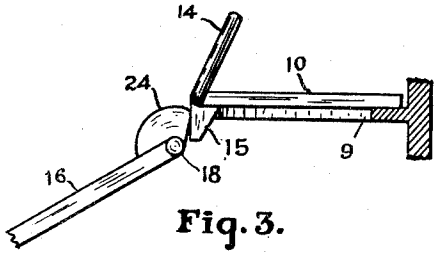


Fig. 3.

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STOVE

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7 Claims. (Cl. 126—75)

My invention relates to stoves of the general type wherein a damper is employed to direct the flow of the products of combustion.

The principal object of my invention is the provision of a stove of high efficiency combined with ease and safety of operation.

Other objects and advantages of my invention will be apparent in the following discourse wherein the significance of the reference numerals in the accompanying drawing, details of construction and operation of a stove embodying my invention, and the particular advantages thereof are explained.

Figure 1 represents a view of the entire stove with connected smoke-pipe partly in elevation and partly in section.

Figure 2 represents a view of the top of the stove.

Figure 3 represents a view of fragments of the damper-chamber and stove-door particularly illustrating the actuating mechanism of the damper shown in the closed position.

Figure 4 represents a view of a fragment of the stove-door partly in section to reveal the draft control devices attached thereto.

The numeral 1 indicates a cylindrical steel shell supported upon legs as 2 and 3 attached to the bottom 4 and formed in detail at the upper end thereof with horizontal and inclined sections to accommodate the top 5 formed to effect a closure of the upper end.

A second cylindrical chamber 6 forms the fire-box and is disposed in concentric relationship within the shell 1. It is so formed at its upper end as to provide a spaced relationship between the upper extremities of the fire-box 6 and the top 5 as shown at 7.

The top 5 is formed with a damper-chamber 8 fashioned interiorly with a damper seat 9 and exteriorly to provide a place of attachment for the smoke-pipe 11.

A damper 10 is formed with lateral shaft portions 12 and 13 upon which the damper swings in suitable journals in the said damper-chamber 8 upon an horizontal axis. One of the said shaft portions 13 is extended and formed into a handle 14. Extending downwardly from the said horizontal axis upon which the said damper 10 swings is a lug 15 formed upon the under side of the damper 10.

A door 16 is journaled in the top 5 at 17 and 18 and is provided with a handle 19 for raising to attend the fire. Depending from the under side of the door 16 is a draft-pipe 20 pivotally attached at 21 and communicating at it upper end with a suitable aperture 22 in the door 16. A screw-adjusted draft-control 23 is mounted to cover the aperture 22.

Extending upwardly from the horizontal axis upon which the door swings is a cam 24 formed integrally upon the door 16.

A second smoke outlet is provided at the bottom of the shell 1 by means of a pipe connection 25 which provides unobstructed communication between the lower part of the shell 1 and the smoke-pipe 26 to which the upper smoke-pipe 11 is also attached.

On starting a fire the kindling is laid in the usual manner in the fire-box 6, the damper 10 is opened by means of the handle 14 and the draft-control 23 opened. As soon as the chimney draft is established the damper 10 is lowered to its closed position as illustrated in Figure 3 when the products of combustion are drawn downwardly around the fire-box 6 to the lower part of the shell 1 from where they flow out through the lower smoke-pipe connection 25 and smoke-pipe 26, thus providing a high kindling temperature within the fire-box 6 and a relatively great radiating surface afforded by the exterior surface of the shell 1 extending nearly to the floor.

My invention contemplates this high operating efficiency combined with certain novel advantages accruing out of the special arrangement and forms of the door 16, draft-pipe 20, damper 10, and inclined top 5 coacting to provide new effects of great value.

When it is necessary to attend the fire, the door 16 is raised by means of the handle 19 to the approximate position shown in Figure 1 or slightly higher when the fire box may be examined or fuel added. In this upward movement of the door 16, the damper 10 is automatically opened by the operation of the cam 24 engaging the lug 15 as shown in Figure 3. It is to be observed that the full opening of the damper 10 is attained with only a slight movement of the door 16 and the damper 10 is held in the open position as the door 16 is further raised to the limit of its swing. This is accomplished by the arcuate form of the cam 24 in the manner well understood. This upward movement of the damper 10 of relatively great celerity provides for the impulsion upwardy of the gases contained in the damper chamfer 8 and the consequent immediate establishment of the flow of the products of combustion out through the smoke-pipe 26 to the end that no smoke will be emitted from the door opening. This effect is further enhanced by the inclined position of the

door 16 as illustrated in Figure 1 where the upward flow of gases from the fire-box will be diverted toward the damper-chamber 8.

At the same time the influx of fresh air normally flowing downwardly through the draft-pipe 20 is broken by reason of the admission of atmospheric pressure to the fire-box.

When the door is in the open position as shown in Figure 1 the connection between the upper end of the draft-pipe 20 and the aperture 22 in the door 16 is broken and a large proportion of the gases naturally tending to rise in the draft-pipe 20 at this juncture is directed rearwardly toward to the normal smoke outlet. Indeed, by judicious handling of the door, escape of smoke through the aperture 22 may be entirely avoided.

Should it be necessary to gain greater access to the fire-box 6 as for putting in large pieces of fuel, or cleaning out of ashes, the door 16 may be swung past the vertical where it will remain by force of gravity. When the door is thus opened to its fullest extent the draft-pipe 20 will thus be removed from the center of the fire-box 6 toward the rear thereof and at the same time raised sufficiently to permit easy access to the most remote portions.

Upon closing the door 16 the draft-control 23 is automatically reconnected in its operative position, the lower end of the draft-pipe is replaced over the center of the fire at the proper level, and the damper 10 is automatically lowered to its closed position and the flow of gases once more directed to the lower smoke outlet as at first described.

Having described my invention what I claim is:

1. In a stove of the type described, a door and a damper pivotally mounted to swing in opposite directions upon parallel axes and formed respectively with an arcuate cam extending upwardly from the axis of said door mounting and a lug engaged by said cam extending downwardly from the axis of said damper mounting to provide for the simultaneous and unequal movement of both said door and said damper when the former is opened and for the independent manual operation of the latter.

2. In a stove having upper and lower smoke outlets, a damper to direct the products of combustion through one or the other of said smoke outlets pivotally mounted and formed with a lug depending from the axis of said pivotal mounting, in combination with a door pivotally mounted in proximity to said damper and formed with a cam to engage said damper lug to lift said damper when the door is opened and to allow of the disengagement of said lug and cam when the said damper is operated manually.

3. A stove comprising, a fire-box, a shell surrounding said fire-box in spaced relationship thereto, an upper smoke outlet communicating with both said fire-box and said shell, a lower smoke outlet communicating with the lower portion of said shell, a damper closed by gravity disposed in said upper smoke outlet formed with a lug, and a door affording access to said fire-box formed with a cam to engage said damper lug to open said damper, wherein said cam and said lug are so formed and arranged to provide for the simultaneous lifting and opening of said damper and said door when the latter is opened.

4. A stove comprising, a fire-box, a shell surrounding said fire-box in spaced relationship thereto, a top affixed to said shell above the upper extremity of said fire-box, an upper smoke outlet communicating with both said fire-box and said shell, a lower smoke outlet communicating with the lower portion of said shell, a damper disposed in said upper smoke outlet formed with a lug, a door fitted to said top formed with a cam to engage said damper lug, an aperture in said door fitted with a device for closing the same, a draft-pipe pivotally suspended from the under side of said door communicating with said aperture when said door is closed to conduct fresh air to the fire and disconnected therefrom when said door is opened, and suitable handles attached to said door and said damper for manual operation.

5. A stove comprising, a fire-box, a shell surrounding said fire-box in spaced relationship thereto, a top affixed to said shell to provide intercommunication between said fire-box and said shell, an upper smoke outlet formed in said top and communicating with both said fire-box and said shell, a lower smoke outlet communicating with the lower portion of said shell, a pivotally mounted damper disposed in said upper smoke outlet and formed with a lug, a door fitted to said top and pivotally attached thereto to swing upon an axis parallel with that of said pivotal damper-mounting formed with a cam to engage said damper lug, an aperture in said door fitted with a closing device, and a draft-pipe pivotally suspended from the under side of said door communicating with said aperture when said door is closed to conduct fresh air to the fire and disconnected therefrom when said door is opened, and suitable handles attached to said door and said damper for manual operation.

6. A stove comprising, a fire-box, a shell surrounding said fire-box in spaced relationship thereto, and inclined top affixed to said shell to provide intercommunication between said fire-box and said shell, an upper smoke outlet formed in said top communicating with both said fire-box and said shell, a lower smoke outlet communicating with the lower portion of said shell, a pivotally mounted damper disposed in said upper smoke outlet and formed with a lug, a door fitted to said top and pivotally attached thereto to swing upon an axis parallel with that of said pivotal damper-mounting formed with a cam to engage said damper-lug, an aperture in said door fitted with a closing device, and a draft-pipe pivotally suspended from the under side of said door communicating with said aperture when said door is closed to conduct fresh air to the fire and disconnected therefrom when said door is opened.

7. In a stove of the kind described, the combination of an inclined top fitted with a pivoted door, a pivotally suspended draft-pipe communicating with an aperture in said door, and a damper actuated by a cam moving with said door, the parts being arranged to provide for the opening of said damper and the deflection of said draft-pipe when said said door is opened.

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