May 9, 1939. D. J. HOWARD 2,157,413

WINDOW FOR STOVES

Filed July 14, 1938

Fig. 2

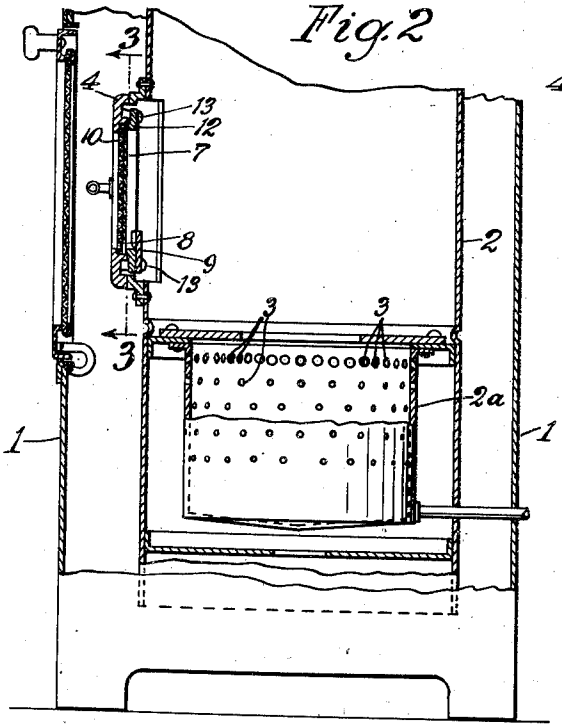


Fig. 4

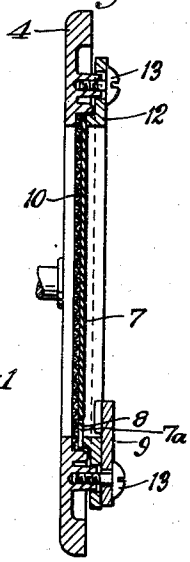


Fig. 5

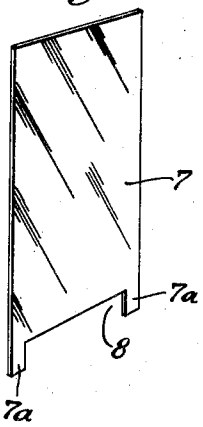


Fig. 1

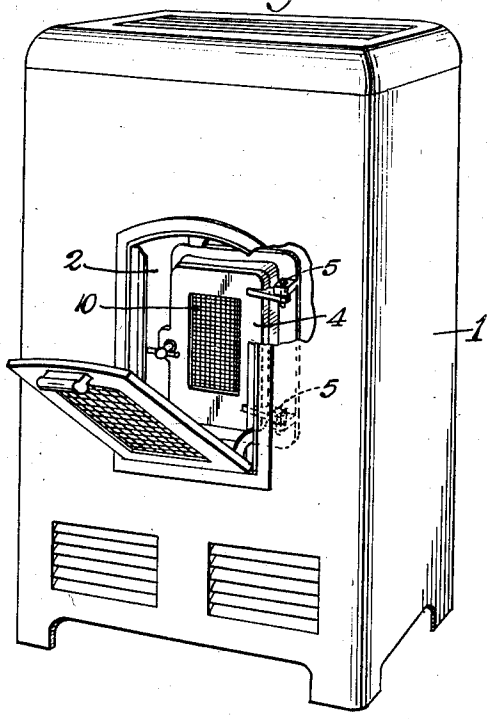
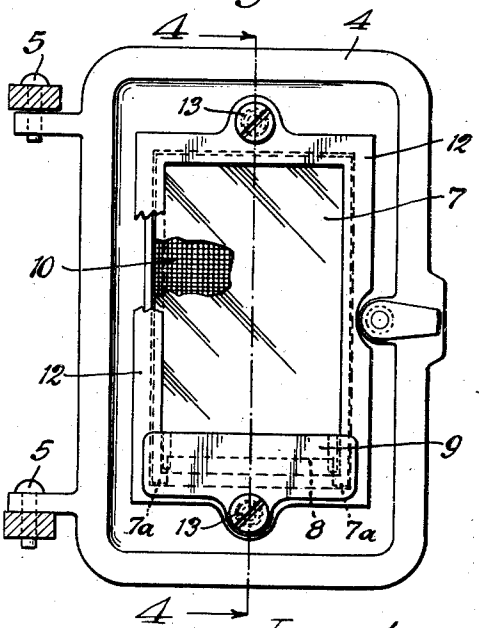


Fig. 3



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2,157,413

WINDOW FOR STOVES

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Application July 14, 1938, Serial No. 219,114

10 Claims. (Cl. 126—193)

My invention relates to an improvement in stove windows, and particularly to observation windows for use with heaters such as liquid hydrocarbon burners.

One purpose is the provision of an observation window which shall include a transparent member and means for preventing the deposit of carbon on said member.

Another purpose is the provision of a window in which air is admitted from outside in relatively small volume in order to prevent the deposit of carbon on the interior of the window.

Another purpose is the provision of means for admitting such outside air without danger of explosion because of the presence in said outside air of inflammable gases, vapors, and the like.

Other purposes will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawing wherein:

Figure 1 is a perspective;

Figure 2 is a partial vertical section;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a section on the line 4—4 of Figure 3; and

Figure 5 is a perspective view of the transparent pane.

Referring to the drawing, 1 generally indicates an outer heater housing in which may be located any suitable inner heater body or drum 2, having in the lower portion a mixing or burner chamber generally indicated at 2*a*, the details of which do not of themselves form part of the present invention. It will be understood, however, that a liquid hydrocarbon is admitted to the bottom of the pot or member 2*a* and mixed with air flowing in through apertures 3 in order to maintain a heating fire located primarily above the upper lip of the member 2*a* and within the drum 2.

Whereas in an efficient hydrocarbon burner there is a minimum deposit of free carbon, none the less under practical operating conditions a certain amount of carbon deposit within the drum 2 at various points therein is inevitable.

4 indicates a window frame which may be hinged as at 5 to provide a door closure for an aperture in the wall of the drum 2. Located in the door is a transparent pane 7 of mica or the like which is of such length as to leave a slot or opening 8 across the bottom thereof. This opening preferably extends entirely across the bottom of the exposed portion of the mica member or pane and is herein shown as being merely a gap within the frame or aperture in which the mica pane is located. To support it in proper position, the pane may have legs 7*a*.

9 is any suitable interior baffle adapted to direct the air flowing inwardly through said gap 8 upwardly across the inner face of the entire pane 7. For purposes of appearance and safety, I provide a layer of mesh, wire cloth or the like 10 which overlies the front of the pane 7 and also the aperture 8, thus masking the aperture from the outside so far as the appearance of the element is concerned. The mesh 10 serves to protect the mica from breakage. It also permits a ready flow of air through the gap 8 into the interior of the burner. Since there is a possibility that there may be inflammable vapors, gases and the like in such air, the mesh 10 provides an important safety element since, if inflammable vapors do flow through the mesh and into the interior of the burner and become ignited, the flame will not pass through the mesh and ignite the vapors outside. It also adds to the sightliness of the device. Since these stoves are prevailingly sold for home use, if the pane of mica were not masked by a sheet of mesh the gap at the bottom of the mica would be apparent and unsightly.

As illustrated in Figures 3 and 4, the mesh 10 and the pane 7 may be secured to the window frame 4 by an inner supplemental frame 12 and fastening screws 13. The frame 12 further serves as a spacer for the baffle 9.

In the normal operation of the device, the flame and hot products of combustion flow or circulate upwardly through the interior of the drum 2. Any carbon would, therefore, be carried upwardly and generally vertically and would be deposited on the inner faces of the walls of the drum 2. In the structure herein described, a constant circulation of outside air passes through the slot 8 and is directed by the baffle 9 directly upwardly across the inner face of the mica pane 7. The effect of this circulation of outside air is positively to prevent the deposit of free carbon on the mica pane. Tests under practical conditions indicate that whereas, if such circulation of air is prevented, the inner face of the mica pane frequently becomes clouded or entirely obscured by carbon or soot, the constant flow of air through the air gap 8 and upwardly across the inner face of the mica pane 7 keeps the pane entirely free from carbon and prevents any difficulty in observing the interior of the burner. It is important that the operator be able to in-

spect flame conditions within the burner in connection with controlling the feed of fuel to the pot 2a, controlling the draft and the liquid. Furthermore, in addition to making it more difficult efficiently to operate the burner, the deposit of carbon on the interior of the observation window is unsightly and unpleasant to the user.

It will be realized that whereas I have described and shown a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts. I therefore wish my description and drawing to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to the details therein described and shown.

For example, while I find it preferable to have a single gap or slot 8 across the bottom of the mica pane 7, I might employ a series of holes spaced sufficiently closely to maintain a substantially continuous flow of air across the inner face of the member 7. It will be understood also that any other suitable means for directing a generally continuous flow of air across the inner face of the member 7 may be employed.

Under some circumstances it may be practical to direct the air laterally from one or both sides of the pane 7 but I find it preferable and more efficient to employ the bottom slot or gap since the air which passes through such slot and is directed by the baffle 9 flows in the general direction of circulation of the heated gases of combustion, which is of course upwardly from the pot 2a toward the top of the burner, for escape through any suitable flue not herein shown.

Whereas I have described the pane 7 as being of mica, it will be understood that it may be formed of any suitable transparent material, for example of heat resisting glass or the like. It will be understood also that the form of the pane can be widely varied and it might be of irregular shape or even round. Any suitable air admission aperture may be employed, either at the bottom or sides or all around the pane 7, with means for directing or baffling the air across the face and preferably upwardly across the face of the pane in order to prevent the deposit of soot, smoke or carbon. It will be understood that where I employ the term "soot" I wish it to be understood as broad enough to cover any soot, carbon particles or substances which are deposited by smoke or the by-products of combustion, and which would tend to fog, dirty or obscure the pane 7.

An additional effect of the passage of air across the inner face of the pane 7 is to act as an insulating medium for keeping the pane cool and for preventing the opposite sides of the pane from being subjected to too widely different temperatures. Where the temperature differential is too great, condensation of the hot gases is likely to take place on the inner side of the pane, with resultant deposit of smoke, soot or dirt particles.

I claim:

1. In a stove, a combustion chamber and an observation window in the wall thereof, said window including an outer air pervious member and an inner transparent air impervious member, said transparent member terminating short of the bottom of said pervious member, whereby an air admission aperture underlies substantially the entire width of said transparent member, and baffle means for directing the air admitted through said aperture upwardly across the inner surface of the transparent member in the general direction of movement of the heated gases and by-products of combustion within the combustion chamber.

2. In a stove, a combustion chamber and an observation window in the wall thereof, said window including an outer layer of mesh and an inner transparent member, said inner transparent member terminating at its bottom above the bottom of the mesh, whereby an air admission aperture is provided underlying substantially the entire width of said transparent member, and baffle means for directing air admitted through said aperture upwardly across the inner surface of the transparent member in the general direction of movement of the heated gases and by-products of combustion within the combustion chamber.

3. In a stove, a combustion chamber and an observation window in the wall thereof, said window including a pane of transparent material having a recess extending across a substantial part of the lower edge thereof, said recess being bounded at each end by a downwardly extending supporting leg integral with the pane, a frame adapted to mask the edge of said frame, including said legs, a body of mesh positioned forwardly of and masking said pane and the aperture so formed at the bottom thereof, and baffle means within said frame adapted to direct the inflowing air directly across the inner face of said pane.

4. In a stove, a combustion chamber and an observation window in the wall thereof, said window including a transparent pane, said wall having an air inlet aperture adjacent said pane, means for directing a flow of air from said aperture across the inner face of the pane, and for thereby preventing the deposit of soot on the pane, and means for preventing the ignition through said aperture of inflammable gases located outside of the stove, said means including a member of mesh associated with said pane and intercepting said aperture, said mesh member being adapted simultaneously to protect the transparent pane and to mask said aperture and render it substantially invisible to the observer.

5. In a stove, a combustion chamber and an observation window in the wall thereof, said window including a transparent pane, an air inlet aperture formed in and adjacent the bottom of said pane, and baffling means adapted positively to direct a flow of air upwardly across and in general parallelism with the inner face of the pane, and for thereby preventing the deposit of soot thereon.

6. In a stove, a combustion chamber and an observation window in the wall thereof, said window including a transparent pane, an air inlet aperture formed in and adjacent the bottom of said pane, baffling means adapted positively to direct a flow of air upwardly across and in general parallelism with the inner face of the pane, and for thereby preventing the deposit of soot thereon, and an air pervious netting positioned forwardly of and in close proximity to the transparent pane, said netting overlying and being adapted to mask the entire effective surface of said pane and said air aperture.

7. In a stove, a combustion chamber having an opening for an observation window in a side wall thereof, said window including a transparent pane mounted to cover the opening except for an air inlet extending transversely adjacent the lower edge of the pane, and a transversely extending baffle member supported behind the air inlet and having a portion projecting upwardly substantially parallel to the pane and overlap-

ping a lower portion thereof but spaced rearwardly therefrom to provide a narrow vertical passage through which air entering through the inlet is directed upwardly in contact with the inner face of the pane.

8. In a stove, a combustion chamber having an opening for an observation window in a side wall thereof, said window including a transparent pane mounted to cover the opening except for an air inlet extending transversely adjacent the lower edge of the pane, and a sheet of air pervious mesh material positioned in front of the pane and covering both the pane and air inlet, and a transversely extending baffle member supported behind the air inlet and having a portion projecting upwardly substantially parallel to the pane and overlapping a lower portion thereof but spaced rearwardly therefrom to provide a narrow vertical passage through which air entering through the inlet is directed upwardly in contact with the inner face of the pane.

9. In a stove, a combustion chamber having an opening for an observation window in a side wall thereof, said window including a transparent pane apertured adjacent its lower edge portion to form an air inlet, the pane being mounted to cover the opening except for the air inlet, and a baffle member supported behind the air inlet and having a portion projecting upwardly substantially parallel to the pane and overlapping a lower portion thereof but spaced rearwardly therefrom to provide a narrow vertical passage through which air entering through the inlet is directed upwardly in contact with the inner face of the pane.

10. In a stove, a combustion chamber having an opening for an observation window in a side wall thereof, said window including a transparent pane apertured adjacent its lower edge portion to form an air inlet, the pane being mounted to cover the opening except for the air inlet, and a sheet of air pervious mesh material positioned in front of the pane and covering both the pane and air inlet, and a baffle member supported behind the air inlet and having a portion projecting upwardly substantially parallel to the pane and overlapping a lower portion thereof but spaced rearwardly therefrom to provide a narrow vertical passage through which air entering through the inlet is directed upwardly in contact with the inner face of the pane.

DAVID J. HOWARD.