954,354

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Liquid Fuel Burners

We, KARMA (NEW MALDEN) LIMITED of 6, Woodlands Avenue, Coombe Lane, New Malden, Surrey, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a burner of the type described in our Patent Number 839,587 and has as an object to provide improvements or modifications to the invention described and claimed therein.

In Patent Number 839,587 there is described and claimed a liquid fuel stove comprising a burner element and surrounding the burner element and extending upwardly therefrom an upper air shield of which a lower end having a lower edge extends downwardly at least substantially to the level of the burner element wherein the burner element is enclosed from below by a lower air shield located below the burner element and there is provided an upstanding peripheral air shielding wall which is effectively continuous with the lower air shield at the edge thereof and of which an upper end having an upper edge extends upwardly at least substantially to the level of the said lower edge of the said upper air shield, the upper edge of the said peripheral wall being wholly spaced from the burner element at a greater distance from the burner element than is the lower edge of the said upper air shield.

According to one aspect of the present invention there is provided in the pot formed by the upstanding peripheral air shielding wall and the lower air shield described and claimed in Patent Number 839,587 a plurality of partitions in at least the lower interior part of the pot to divide the pot into a plurality of sections so that the air entering downwardly into the pot is substantially confined to its section to be deflected upwardly into the burner and is prevented from swirling in or gathering to one side of the interior of the pot.

It is preferred that the upstanding peripheral air shielding wall is concentrically arranged about the upper air shield of the burner. The height of this shielding wall above the lower edge of the upper air shield will depend upon the size of burner, the rate of burning, and the other characteristics of the stove.

Conveniently the inside of the pot may be contoured so as to provide a smooth flow of air first downwardly into the pot and then upwardly into the burner.

According to a further aspect of the invention there may be provided a central upstand extending from the floor of the pot towards the trough of the burner which serves to deflect air entering downwardly into the pot upwardly into the shells of the burner.

In yet a further aspect of the invention the peripheral upstanding air shielding wall extends upwardly to at least the inner face of any reflector provided on the burner.

The invention will now be described with reference to the accompanying drawings in which:—

Figure 1 shows diagrammatically in section a construction of burner in accordance with the invention described and claimed in the parent Patent Number 839,587;

Figure 2 shows a construction of burner broadly in accordance with the aforesaid parent Patent and incorporating an improvement or modification of the said parent Patent;

Figure 3 shows the invention of the parent Patent Number 839,587 applied to a stove which incorporates a reflector;

Figure 4 shows partly in section a detail of the stove shown in Figure 3; and

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Figure 5 shows a plan view of the stove shown in Figure 3.

Referring to Figure 1, the burner itself is constructed in accordance with known practice and comprises an outer imperforate casing 1, a pair of inner perforated shells 2 and 3, and an inner imperforate air tube 10, the assembly being held together conveniently by a pair of rods at right angles, one of which 16 is shown. The shell construction stands on the top of a trough 5 which contains the wick 4, oil being fed to the trough in known manner by the feed pipe 6. The upper end of the burner is usually covered by a mantle 7 and a spreader plate 17 is located at the upper end of the air tube 10 to deflect air across the tops of the shells 2 and 3. This general construction and manner of operation is well known.

Heretofore the air for the burning oil has been allowed to enter the burner from underneath through any convenient air holes provided in the side or bottom of the casing in the stove and on the creation of a down draught in the space between the shells 2 and 3, for example by a draught being deflected from the reflector of the stove down into the burner, the flame is either suppressed momentarily and then flares up beyond the confines of the burner and reflector or the flame may even be deflected around the outside of the casing of the burner and may reach the fuel supply cup to ignite the paraffin or other fuel in the cup.

According to the invention of Patent No. 839,587 there is provided around the base and outer wall of the burner assembly a screen which, in accordance with the embodiment shown in Figure 1, comprises an imperforate cylindrical wall 13 provided with an imperforate base 14. The height of the cylindrical wall 13 should be such that any down draught is directed into the pot formed by the wall 13 and the base 14 to create an increased upward pressure inside the burner which balances out any down draught created at the same time in the burner.

The pot in addition to serving to counteract and balance out any down draught in the burner also controls the entry of air to the burner since the only access for air to the burner is through the space 15 between the outer casing 1 of the burner and the cylindrical wall 13.

Figure 2 shows a burner of the same general construction surrounded by a pot of similar shape although in this case the cylindrical wall 13 extends higher up the burner. The base 14 is provided with a central upstand 18 to act as an upward deflector for the air entering into the pot. Furthermore there is aranged around the floor 14 a number of equally spaced fins or partitions 19 which divide the circular floor and the lower part of the pot into a number of equal sections so that air entering the pot is prevented, when it reaches the base of the pot, from swirling around in the base and gathering to one side or the other. The fins or partitions 19 restrict the air entering that sector to that sector and direct and deflect it upwardly into the burner assembly. The floor 14 is conveniently arranged so as to allow the main feed pipe 6 to lie outside the pot and so to remain cool and to keep the temperature of the fuel in the pipe down to below boiling point.

If desired the inside of the pot may be contoured so as to give a smooth flow of air downwardly into the pot and so as to deflect the air in a curved path upwardly into the burner. Conveniently and to ensure that any air entering the burner assembly is flowing in a truly upward direction the outer shell 1 extends somewhat below the lower edge of the shells 2 and 3.

Figure 3 shows a front view of a stove incorporating a feature of the present invention in which the burner is supported within a casing 20 which is provided with a reflector 21 of substantially spherical curvature. The burner assembly shown in chain line projects into the reflector 21 so that the radiant mantle 7 is situated approximately in the focal point of the reflector. The cylindrical wall 13 may project any desired extent into the reflector and for example may have its upper edge coincident with the edge of the hole in the reflector 21 through which the burner projects. This is shown in Figure 4 in full line 22. Alternatively, the cylindrical wall 13 may extend above the level of the reflector, for example as shown in dotted line 13. If desired the wall 13 may project above the surface of the reflector at the back and may be contoured downwardly to the front. Again the aperture in the reflector may fit closely around the cylindrical wall 13 or if desired there may be an annular space formed so that any excess down draught is allowed to escape outside the wall 13 and to escape harmlessly away through the casing 20 of the stove.

It will be realised that the invention is not limited to the construction shown in the drawings and, for example, the radial fins or partitions 19 may be of any desired number and may extend for any desired height within the pot and up the annular passage between the wall 13 and the outer casing 1 of the burner. If desired other baffles may be inserted either in this annular space or in the body of the pot to direct the air in any desired and beneficial direction. In addition perforated baffles 25 (see Figure 1) may be inserted in or between one or more of the shells of the burner assembly in order to smooth out the air currents or in the pot or in the annular space.

As a further alternative, there may be pro-

vided in the place of the central upstand 18, which may extend any desired distance into the burner assembly, a central tube leading from beneath the floor 14 of the pot into the central tube 10 of the burner.

Whilst in most cases the burner assembly and the cylindrical surrounding wall 13 of the pot is concentric therewith, it will be realised that the cross section of the pot may be of any desired shape and may be provided with means for adjustment of its height with respect to the burner, the extent of the space between the cylindrical wall of the pot and the outer casing of the burner and its height being determined by the size of the burner, the rate of burning, and the amount of down draught likely to be encountered and the minimum draught conditions which the burner has to encounter.

WHAT WE CLAIM IS:—

1. An improvement in or modification of the liquid fuel stove as claimed in Patent Number 839,587 wherein there is provided in at least the lower interior part of the pot formed by the upstanding peripheral air shielding wall and the lower air shield a plurality of partitions to form a plurality of sections so that air entering downwardly into the pot is substantially confined to its particular section to be deflected upwardly into the burner and is prevented from swirling in and gathering to one side of the interior of the pot.

2. An improvement in or modification of the invention claimed in Patent Number 839,587 in which a central upstand is provided extending from the floor of the pot formed by the upstanding peripheral air shielding wall and the lower air shield towards the trough of the burner so as to deflect air entering downwardly into the pot from outside the burner upwardly into the shells of the burner.

3. An improvement in or modification of the invention claimed in Patent Number 839,587 in which there is provided a reflector and in which the upstanding peripheral air shielding wall extends at least to the wall of the reflector.

4. A liquid fuel stove substantially as described with reference to the accompanying drawings.

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