

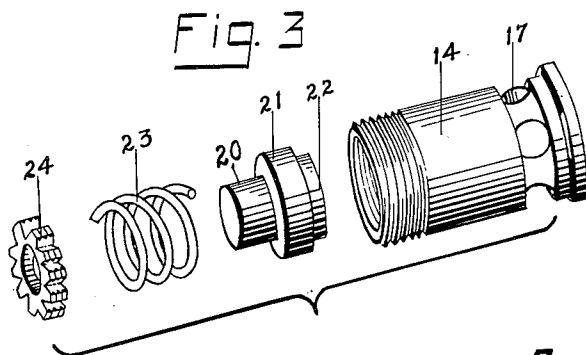
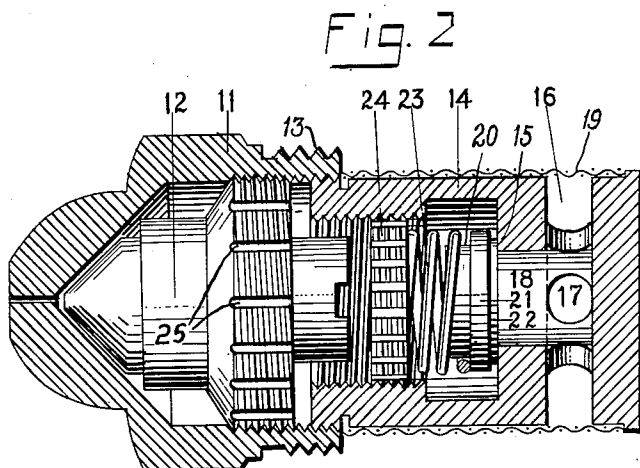
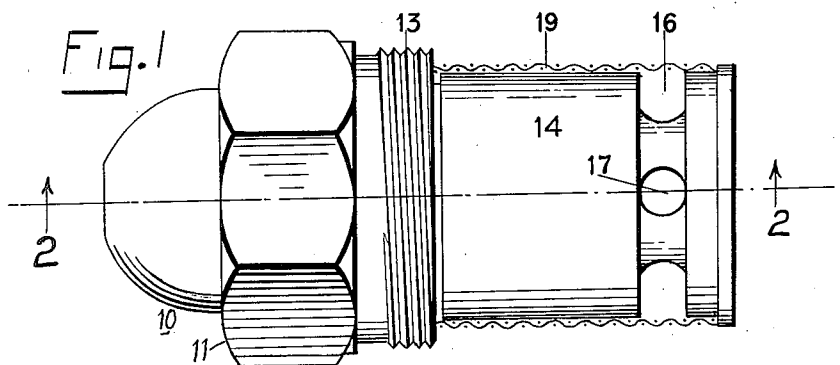
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B. PIERONI

2,621,077

CHECK VALVED NOZZLE

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BRUNO PIERONI
INVENTOR.

BY *Frank G. Brabham*
Attorney

UNITED STATES PATENT OFFICE

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CHECK VALVED NOZZLE

Bruno Pieroni, New York, N. Y.

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2 Claims. (Cl. 299—150)

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This invention relates to domestic oil burning heating units, and more particularly to means for curing the faults found in many of the presently installed units.

As is well known many of the presently installed domestic oil burning heating units comprise, a blower, a bellows valve, and a discharge nozzle. In operation, the blower is automatically rendered operative in response to a drop in temperature in a room to be heated to a predetermined value. When the blower is thus rendered operative it builds up pressure sufficient to force the bellows valve open and to force oil from a suitable source of supply through the valve into the nozzle from whence it is discharged in the form of a spray into a combustion chamber where it is ignited by means of an electric spark. Thereafter, when the temperature in the room increases to a predetermined value the blower is automatically rendered inoperative at which time the bellows valve closes to prevent further feed of oil into the combustion chamber.

While in general, such heating units are satisfactory, they are open to the objection that when the blower stops and the bellows valve closes, the oil in the line between the bellows valve and the nozzle instead of being discharged into the combustion chamber in the form of a spray which is needed to insure combustion thereof simply drips into the combustion chamber and remains unburned. This unburned fuel, due to the residual heat in the chamber, vaporizes and so creates gases with the result that when the blower is again rendered operative and the spark created an explosion frequently results.

Still another objection to such units is the fact that frequently, the bellows valve fails to completely shut off the flow of oil to the nozzle with the result that a slow leak of oil into the combustion chamber takes place. As explained above, this oil vaporizes and creates gases which frequently explode when the blower is rendered operative and the ignition spark is created.

In accordance with the present invention, the above noted as well as other objections are obviated by means of a check valve which is adapted and arranged to be coupled to the discharge nozzle without any modification thereof. This valve is set so that when the blower starts, it, as well as the bellows valve, opens to admit the inflow of oil to the discharge nozzle and closes to prevent the inflow of oil to the nozzle when the blower stops and the pressure created thereby drops to a predetermined value. The check valve being coupled to the discharge nozzle serves to

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trap the oil in the feed line between the bellows valve and the discharge nozzle and so prevents it from dripping into the combustion chamber. Also, it serves to prevent the inflow of oil into the combustion chamber in the event the bellows valve fails to completely shut off the supply of oil to the feed pipe leading to the discharge nozzle.

For a clear understanding of the invention reference may be made to the accompanying drawing wherein the invention has been shown merely by way of example and in preferred form. Obviously, however, many variations and modifications may be made therein which will still be comprised within its spirit. It is to be understood, therefore, that the invention is not to be limited to any specific form or embodiment except in so far as such limitations are specified in the appended claims.

Referring to the drawings—

Fig. 1 is a plan view of a discharge nozzle having a check valve operatively connected thereto; Fig. 2 is a sectional view taken along line 2—2 of Fig. 1; and

Fig. 3 is an exploded view of the check valve showing its component parts.

Referring to the drawings 10 represents a discharge nozzle of the type commonly used in connection with a domestic oil burning heating unit. As is well known, such nozzles, in general, comprise a housing 11 having a valve member 12 threaded therein. As usual, the housing 11 is provided with an externally threaded portion 13 by means of which it may be coupled to the feed line (not shown) leading from a bellows valve (not shown).

In accordance with the present invention, the nozzle 10 is provided with a check valve which in the present embodiment of the invention comprises a housing member 14 threaded externally at one end to enable it to be coupled to the housing 11 behind the stem of the valve member 12. Adjacent its other end, the housing member 14 is provided with an annular groove 16. A plurality of input ports 17 leads from the annular groove 16 to an inlet chamber 18 which opens into an outlet chamber 14a through the shoulder 15. The input ports 17 are protected against the inflow of solid matter by means of a screen filter 19 positioned about the housing member 14.

A valve 20 is positioned in the housing member 14. Preferably, the valve 20 is made by securing to a suitable holder 21 a facing 22 of non-metallic material such as any one of the commercial synthetics (neoprene) which is re-

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sistant to the corrosive action of oil. It is to be understood, however, that the valve 20 may be made entirely of oil resistant material. Normally, the valve 20 is maintained pressed against the shoulder 15 so as to maintain the inlet chamber 18 closed by means of a spring 23 positioned between the valve 20 and an apertured disk 24 threaded into the tubular member 14. Alternatively, the disk 24 may be dispensed with and the spring 23 positioned between the valve 20 and the stem of the valve member 12 threaded into the housing 11.

In operation, when the blower starts in response to a drop in temperature in a room to be heated to a predetermined value and the bellows valve opens, oil is forced through the feed line, through the filter 19, through the input ports 17 which lead from the annular groove 16 and into the inlet chamber 18 which, as stated heretofore, is normally maintained closed by the valve 20 being pressed against the shoulder 15 by means of the spring 23. The pressure exerted by the spring 23, however, is so adjusted by means of the disk 24 that it yields at or slightly below the pressure exerted by the blower. Under these conditions, the valve 20 opens and so permits the oil to be forced through the housing member 14 into the discharge nozzle through radial slots 25 in the threaded portion of the adjustable valve from whence it is discharged into the combustion chamber and ignited in the usual manner. Thereafter, when the blower stops in response to an increase in temperature in the room to be heated and the pressure drops, both the bellows valve and the check valve close to prevent further feed of oil into the discharge nozzle. Under these conditions, the oil in the feed pipe between the bellows valve and the discharge nozzle which heretofore used to drip into the combustion chamber is trapped between the two valves. In addition, in the event the bellows valve fails to function in the manner intended, the check valve serves to prevent discharge of oil which leaks therethrough into the combustion chamber.

Having thus described my invention, I claim:

1. A discharge nozzle comprising a forward housing member, an apertured adjustable discharge valve internally threaded to said forward housing member, a rearwardly disposed housing adapted to be coupled to said forward

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housing and having therein a plurality of inlet ports leading radially into said housing, a valve seat formed within said housing, a valve adapted to seat against said valve seat, a spring to exert pressure against said valve, a disk threadably coupled downstream of said spring to maintain pressure exerted by said spring upon said valve, said disk being apertured to permit flow between the chamber upstream of said disk and the chamber downstream of said disk.

2. A discharge nozzle comprising a discharge element, said discharge element being composed of a housing having an opening for the discharge of fuel, and an internal threadably coupled valve having apertures through its threaded portion, a check valve element coupled with said first housing, an annular recess provided therein, openings in said recess to provide ingress for fuel, a passage, a valve seat formed at the downstream end of said passage, said check valve element being further provided with a valve normally seating in said valve seat, a spring maintaining closing pressure against said valve, a disk, threadably coupled downstream with respect to said spring and abutting it, and apertured about its periphery to permit passage of fuel between the chambers upstream of said disk and downstream of said disk, said disk providing an adjustable means whereby the closing force of said spring upon said valve may be altered.

BRUNO PIERONI.

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