Nov. 28, 1933. R. C. OLSON 1,937,204

REGULATING VALVE FOR LIQUID FUEL AND THE LIKE

Filed Dec. 3, 1931

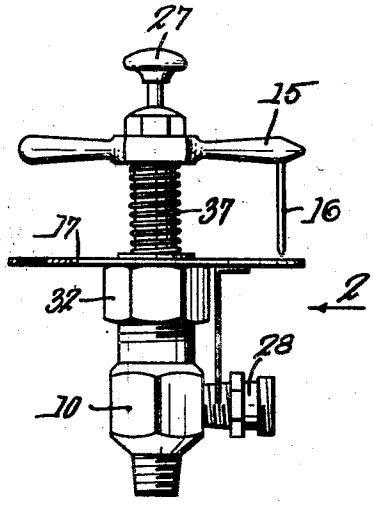


Fig. 1.

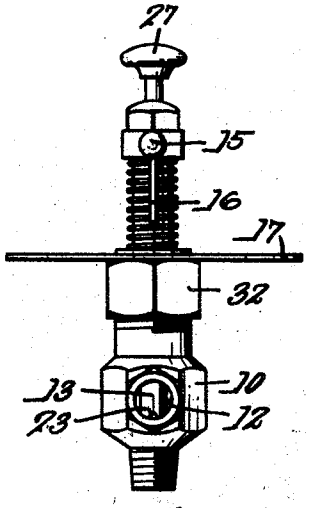


Fig. 2.

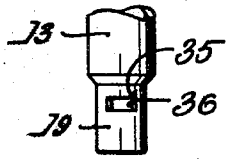


Fig. 7.

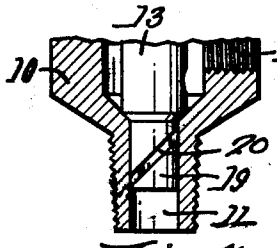


Fig. 4.

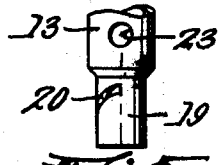


Fig. 5.

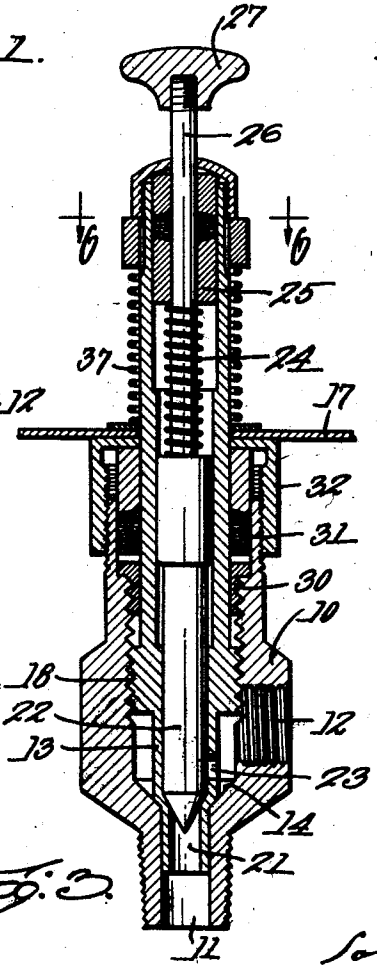


Fig. 3.

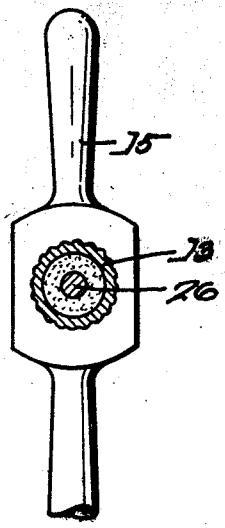


Fig. 6.

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REGULATING VALVE FOR LIQUID FUEL AND THE LIKE

Robert C. Olson, Worcester, Mass.

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6 Claims. (Cl. 277—29)

This invention relates to a valve, capable of other uses, but particularly adapted for regulating the flow of liquid fuel to a burner or furnace.

The principal objects of the invention are to provide a valve having a positive shut-off for all fuel with means cooperating therewith for opening an angular slot to allow the fluid to flow through a very minute aperture thus concentrating the flow and creating a maximum velocity to prevent the adherence of grit and foreign substances to the surfaces of this opening; to provide means whereby the positive closing part of the valve may be opened considerably before the fluid starts to flow through the small orifice; to provide a construction in which, by a very simple motion, a rapid flow of the liquid fuel can be provided, while the valve is closed, for the purpose of priming the burner, and to provide a burner of this character adapted to be used for domestic single or double burners and for furnaces for house heating purposes.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a side elevation of a burner constructed in accordance with this invention;

Fig. 2 is a side elevation at right angles thereto as indicated by the arrow 2 in Fig. 1;

Fig. 3 is a diametrical sectional view of a burner on enlarged scale;

Fig. 4 is a sectional view showing the slit through which the liquid is admitted to the burner for ordinary burning purposes;

Fig. 5 is an outside view of the same, taken at right angles to Fig. 4;

Fig. 6 is a sectional view on the line 6—6 of Fig. 3, and

Fig. 7 is an elevation of the valve showing a modification.

The main part of the valve comprises a valve casing 10 having an inlet 11 and an outlet 12, the inlet being shown as central and longitudinal and the outlet lateral. In the inlet opening 11 is located the main valve 13 which is provided with a conical surface at the bottom to fit a conical valve seat 14 and constitutes positive means for closing the burner. This valve is provided with a handle 15 for operating it and a pointer 16 is shown for measuring on any usual stationary scale 17.

The valve is provided with screw threads at 18 whereby, when the handle 15 is turned, the valve will be raised or lowered. It is shown in closed position. Below the conical valve surface of the valve is a cylindrical extension 19, which is provided with a slanting slit 20 and is traversed throughout the length of this portion by a cylindrical passage 21 into which the slit 20 is cut.

It will be seen that, when the valve is closed, as shown, on the conical seat, no liquid can pass through and that it is only after the valve has been raised materially by turning that the small upper end of the slit 20 is exposed to allow the liquid fuel to flow. This opening can be adjusted by the operation of the handle very minutely and allows the liquid to flow through a very restricted triangular orifice into the outlet 12. For this reason particles and deposits in the liquid are prevented from stopping up the opening through which the liquid passes and, if any should get into it, the valve can be opened still further to allow the liquid to flow.

Screwed into the casing 10 is a stop screw 30 which provides a positive seat for a packing 31. The latter is held in place by a screw cap 32. The screw 30 comes up against a square shoulder and is so proportioned as to stop the opening of the valve at the end of a complete rotation thereof. The scale on which the pointer 16 travels is a complete circle and indicates the whole distance that the valve can be turned.

Another feature of this invention consists in a means for priming the burner when first starting it by introducing the liquid fuel for a short period of time at a high rate of speed. For this purpose the cylindrical passage 21 can be continued up into the valve 13. This passage is filled by a plunger 22 and there is a side passage 23 by which, when the plunger 22 is raised the liquid fuel will be directed through it into the outlet 12. This plunger fits the passage in which it is located and under normal conditions positively closes it by the action of a spring 24 bearing on the top of the plunger and also on the bottom of a metallic packing ring 25. The plunger has a stem 26 on which the spring is located and a handle 27, which is located outside the valve. The operation of this part of the device consists simply in the pulling up of the handle 27 to allow liquid fuel to pass to the burner through a pipe 28. This serves to supply an excess of fuel for the purpose of starting the burner. As soon as it is started the handle 27 is released and the valve 22 is closed. The main valve 13 is then operated as above described.

It will be understood that the angular slot 20 can be made at any desired angle so as to vary the amount of fluid passing through the triangu-

lar part of it that is exposed at the top. Its main feature is the small triangular passage that is provided for the oil when the valve is only slightly opened, thus restricting the flow under high velocity. The same object can be accomplished by a slot of the shape shown in Fig. 7. The small outlet is provided at first through the top 35 of the slot and then full flow is provided through the horizontal part 36 of the same slot. Then the housewife will not keep trying to increase the flow and perhaps turn it the wrong way, which causes trouble in domestic oil burners.

On the plate provided with the circular scale 17 is a spring 37 for two functions. It holds the plate down and holds the stem steady in the presence of vibration or fluctuation and takes up any looseness in the thread on the valve stem.

The screw 30 enters the same screw thread as the thread 18. This introduces an economy in manufacture as only one internal thread has to be made for both. On account of placing the packing above the screw 30, any seepage of oil past the screw threads will be stopped by the packing. There is no outside means for stopping it. As these parts are all built inside the valve economy is effected and a unitary construction is provided.

Although I have illustrated and described only two forms of the invention I am aware of the fact that other modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in this respect but what I do claim is:—

1. As an article of manufacture, a liquid fuel regulating device comprising a valve casing having a seat and provided with an inlet and an outlet, and a valve adapted to close said seat and provided with a hollow extension projecting into the inlet, said extension having a slit through its wall, extending diagonally and substantially throughout the length of the extension and located entirely on one side of the axis thereof and extending into the passage therethrough, whereby when the valve is raised no liquid can pass through it until said slot is exposed beyond the valve seat.

2. As an article of manufacture, a liquid fuel regulating device comprising a casing having a longitudinal inlet at the end thereof and a lateral outlet, and a screw-operated valve having a portion adapted to close the inlet and a hollow extension beyond the valve seat, the extension having a slit extending through to the passage inside, diagonally from bottom to top of substantially half the circumference of said extension, to present a sharp upper end and provide triangular orifices when the valve is opened slightly, and having its end located at a distance from the valve seat, whereby when the valve is raised from the seat liquid will flow as soon as the top of the said slanting slit is exposed above the seat and the size of the opening can be regulated by the amount the valve is opened.

3. As an article of manufacture, a valve comprising a casing having an internal threaded passage, a valve having a thread fitting the internal thread, and a stop screw in the casing fitting said internal threaded passage against which the valve abuts to limit the opening of the valve.

4. As an article of manufacture, a valve comprising a casing having an internal threaded passage, a valve having a thread fitting the internal thread, a stop screw fitting the same thread, to limit the opening of the valve, and a packing beyond said screw, for the purpose described.

5. In a valve for liquid fuel and the like, the combination of a valve casing having an inlet at the end and an outlet, the casing having a valve seat, a screw-operated valve fitting the valve seat and having an extension beyond it, fitting the inlet, and having an axial passage therein, a slot through the wall of said extension for the purpose described, said slot extending diagonally and substantially throughout the length of the extension and located entirely on one side of the axis thereof, said valve being hollow and having a priming outlet through the wall thereof, a second valve normally closing the priming outlet against the passage of liquid through to the last-named outlet but capable of being moved to allow free flow of liquid for priming purposes, a scale plate at the top of the valve casing, an operating handle for the second valve beyond said scale plate.

6. As an article of manufacture, a valve comprising a casing having an internal passage, a valve having a thread fitting a thread in said internal passage and a stop screw within the casing fitting an internal thread in said passage for limiting the opening of the valve, and a packing beyond the stop screw and in the casing for preventing leakage past the stop screw from getting out of the casing.

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