

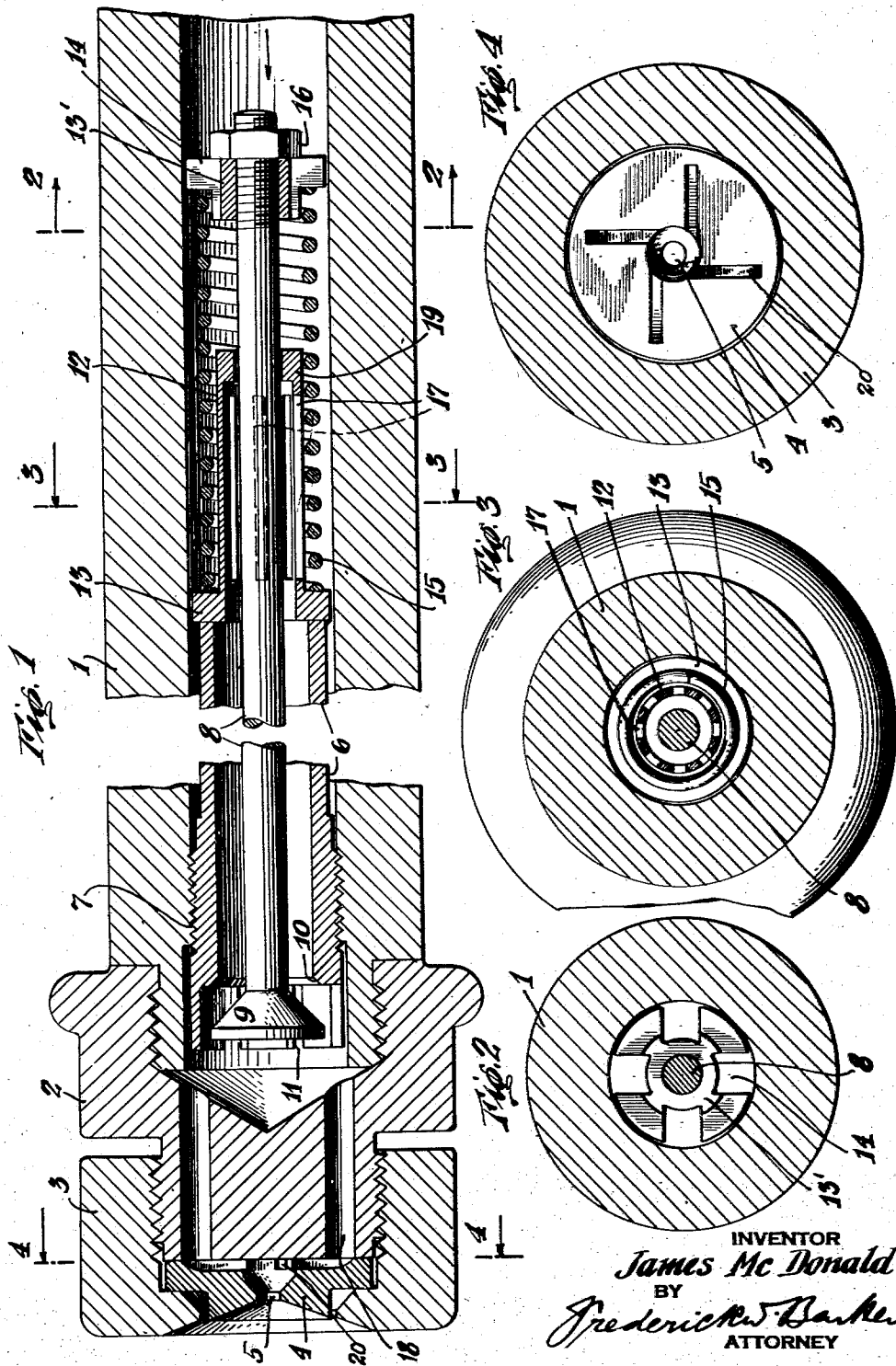
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SHUT-OFF VALVE FOR LIQUID FUEL BURNERS

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SHUT-OFF VALVE FOR LIQUID FUEL
BURNERS

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2 Claims. (Cl. 251-145)

In the operation of liquid fuel burners, when the fuel supply is shut off at its source, the oil remaining in the burner usually drips from the burner end and if allowed to accumulate in the air duct, creates a serious fire hazard. Further, the air register parts become inoperative, resulting in lowered combustion efficiency.

In view of this condition now prevalent with liquid fuel burners my invention is directed to the provision of a shut-off valve including moderate pressure means located in the burner for holding said burner normally closed at a point near its emission means until fuel supply under working pressure is admitted, such working pressure overcoming the normal closing pressure and permitting discharge of the fuel supply from the burner tip.

While not limited in my invention to its use with any particular type of burner I have applied it efficiently with the Todd type of mechanical atomizing burner in which the liquid fuel is forced through the burner at a working pressure of from 80 to 300 pounds, and I have fitted in the burner a valve which is spring held to its seat at a pressure of about 15 pounds, to normally prevent outflow from the burner, which pressure is overcome when liquid fuel is admitted under working pressure, causing the valve to open. Thus the action of fuel stoppage in the burner is automatic with the shutting off the working pressure supply and also the closure or check means is released automatically as liquid fuel is introduced to the burner under working pressure.

A particular feature of invention comprised in this application consists in the assembly of all the elements of the shut-off device so that the same may be placed within and removed from the burner barrel as a unit.

Another feature consists in the positioning of the spring, which holds the valve normally closed, remote from the burner tip, to be distant from the major heat zone, so that it may retain its resiliency, while positioning the closure valve more nearly adjacent the burner tip, to prevent delivery of fuel remaining in the burner when the liquid fuel supply to the burner has been shut off. The unitary assemblage of elements comprising the shut-off device is inclusive of the foregoing feature.

Other features and advantages of my invention will hereinafter appear.

In the drawing:

Figure 1 is a partial, side sectional view, of a liquid fuel burner in which is incorporated my improved shut-off valve.

Fig. 2 is a section on the line 2-2 of Fig. 1.

Fig. 3 is a section on the line 3-3 of Fig. 1, and

Fig. 4 is a section on the line 4-4 of Fig. 1.

In the example of my invention illustrated I have shown the barrel or jacket 1 of a Todd type mechanical atomizing burner, the nozzle body 2, sprayer plate nut 3 and sprayer plate 4 with its atomizing orifice 5, these elements forming no part of the present invention. The usual handle and housing therefor, with liquid fuel admission means, are well known and do not appear in the drawing.

Removably fitting within barrel 1 is a sleeve member 6, threaded toward its rearward end so that it may be screwed into said barrel, as at 7.

Extending through sleeve 6 is a valve stem 8, of considerable length, carrying at its rear end a valve 9 that is adapted to co-act with a valve seat 10 provided at the adjacent end of sleeve 6, a castellar extension 11 of sleeve 6 serving as a cage for the valve.

Sleeve 6 is reduced in diameter at its forward portion 12 and said sleeve is provided at the junction of its rearward and forward portions with a collar or annular shoulder 13 that fits slidably but closely within the bore of barrel 1.

The forward end of valve stem 8 is threaded into a washer 13' that is provided with ports 14 for the passage of liquid fuel, which, as is well understood, enters the burner barrel in the direction of the arrow. A coiled spring 15 is placed about sleeve portion 12 and stem 8, being tensioned between shoulder 13 and washer 13' to hold valve 9 normally against its seat 10. The considerable length of stem 8 enables the spring to be positioned sufficiently distant from the burner tip to be remote from the major heat zone. A nut 16 secures washer 13' in its spring tensioned, adjusted position on stem 8.

It will be noted that ample clearance exists between sleeve 12 and the inner surface of barrel 1 for the flow of liquid fuel entering through ports 14 in washer 13', and the liquid fuel thus introduced is caused to enter sleeve 12 through a series of longitudinal slots 17 that are provided in said sleeve. Since a substantial clearance also exists between stem 8 and the inner surface of sleeve portion 12 a free passageway is provided for the flow of liquid fuel to valve 9, so that when the liquid fuel is under working or atomizing pressure said valve will open and admit the fuel to the passageways 18 in nozzle body 2 and thence to the grooves 20 in sprayer plate 4, for issue at the atomizing orifice 5.

Sleeve 12 is shown as provided with an inter-

riorly thickened forward end portion 19 that serves as a concentric guide bearing for valve stem.

The unitary assemblage of elements constituting my improved shut-off device for use with liquid fuel burners has the attribute of quick placement within and removal from the burner barrel. By simply taking off the nozzle body 2 and applying a suitable tool to the adjacent castellar end of the sleeve said sleeve may be unscrewed and drawn outwardly with the contained complementary elements composing the device. In this way, cleansing, repair and renewal of the shut-off device may be expeditiously performed.

From the foregoing description it will be apparent that I have devised a self contained or unitary apparatus wherein (1) the valve arrangement effectively prevents dripping of liquid fuel from the burner end when the burner flame has been extinguished due to the closing of the pressure supply of fuel; (2) that no undue restriction is set up to the liquid fuel on its passage through the burner; (3) that the arrangement is fully automatic, and (4) that the spring is located away from the excessively hot burner end.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

I claim:

1. A unitary assembly of elements comprising automatic shut-off means to prevent dripping of liquid fuel from burners when the supply source is closed, the same including a sleeve adapted to be removably fitted within a burner barrel and provided with a forward, slotted portion of reduced diameter having its forward end thickened inwardly, said sleeve having a valve seat at its rearward end portion and a castellar extension rearwardly of the valve seat, an annular shoulder defining the juncture between the

sleeve portions of different diameters, a valve stem, a valve carried thereby to coact with said seat, a ported member on the forward end portion of said stem, a coiled spring of moderate tension surrounding said reduced sleeve portion and stem, lying between said shoulder and ported member, to hold said valve normally closed until operating pressure is applied, said castellar extension at the rearward end of the sleeve and said inwardly thickened forward end portion of the sleeve slidably engaging the valve and the stem, respectively, to limit lateral movement of the valve stem when the valve is open and when mounted in the bore of the burner barrel.

2. A unitary assembly of elements comprising automatic shut-off means to prevent dripping of liquid fuel from burners when the supply source is closed, the same including a threaded sleeve adapted to be removably fitted within a burner barrel and provided with a forward, slotted portion of reduced diameter having its forward end thickened inwardly, said sleeve having a valve seat at its rearward end portion and a castellar extension rearwardly of the valve seat, an annular shoulder defining the juncture between the sleeve portions of different diameters, a valve stem, a valve carried thereby to coact with said seat, a ported washer on the forward end portion of said stem, a coiled spring of moderate tension surrounding said reduced sleeve portion and stem, lying between said shoulder and washer, to hold said valve normally closed until operating pressure is applied, said castellar extension at the rearward end of the sleeve and said inwardly thickened forward end portion of the sleeve slidably engaging the valve and the stem, respectively, to limit lateral movement of the valve stem when the valve is open and when mounted in the bore of the burner barrel.

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