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AUTOMATIC SAFETY VALVE

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Fig. 1.

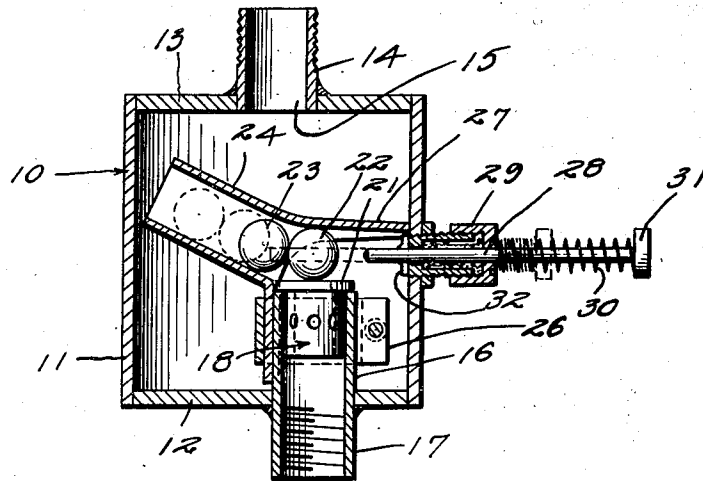
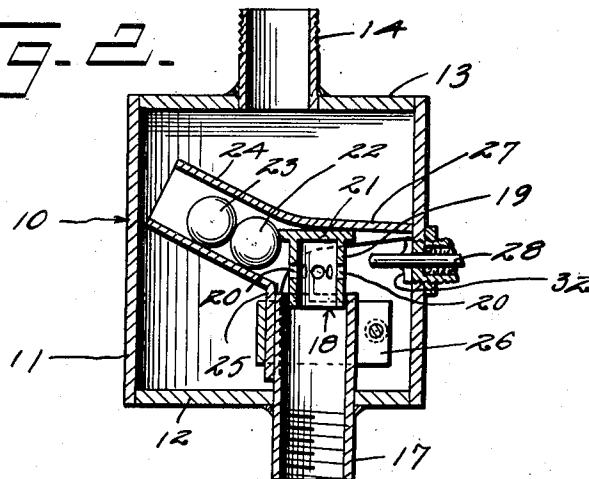


Fig. 2.



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AUTOMATIC SAFETY VALVE

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1 Claim. (Cl. 137-153)

This invention relates to safety valves and more particularly to a safety valve for use with fuel such as gas or the like.

An object of this invention is to provide a safety valve of exceedingly simple construction which is operated by the rise and fall of pressure in the fuel supply line.

Another object of this invention is to provide a safety valve which embodies relatively few moving parts and which, upon failure of the fuel supply or reduction in the pressure in the supply line below a predetermined point, will cut off the flow of fuel and maintain the fuel line closed until the valve has been manually opened or operated, thereby preventing the passage of fuel after the burner has been extinguished and when the supply has been re-established.

The above and various other objects and advantages of this invention will in part be described and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein:—

Figure 1 is a vertical section taken substantially through the center of a device constructed according to the preferred embodiment of this invention, showing the device in locked position.

Figure 2 is a fragmentary vertical section showing the device in open position.

Referring to the drawing wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a housing comprising a cylindrical body 11 provided with a bottom wall 12 and a top wall 13. The top wall 13 has a nipple 14 secured thereto, which communicates with the discharge or outlet port 15 in the top 13. A cylinder 16 is secured to the bottom wall 12, and this cylinder 16 is open at each end and at the lower end has a threaded nipple 17 formed therewith, which extends below the bottom 12 and to which may be connected one portion of a fuel supply line.

A piston or plunger, generally designated as 18, is slidable in the cylinder 16, and this piston or plunger 18 comprises a cylindrical body 19 which is provided with a plurality of radially arranged discharge ports 20, and this cylinder 19 is open at the lower end and closed at the upper end by means of a plate or top member 21. This plate 21 has the marginal edge portion thereof extending beyond the periphery of the plunger cylinder 19 and the extended portions of the top 21 constitute a valve which is adapted to engage the top

of the cylinder 16, which top comprises a valve seat.

The plunger or piston 18 is of a weight such that when the pressure is normal in the fuel supply line attached to the nipple 17, the pressure of the fuel will be sufficient to raise the piston into the open position shown in Figure 2 and the fuel will float the piston during the entire time that the pressure is normal.

In order to close the supply line when the fuel pressure is below normal or has been reduced to a predetermined degree or cut off entirely, I have provided a pair of spherical valve locking members 22 and 23. These valve locking members, in the present instance, are constructed of steel or kindred metal, and a substantially cylindrical guide member 24 extends laterally and upwardly from the side of the piston 18, and these balls 22 and 23 are adapted to loosely engage the guide 24.

The guide 24 is provided with a depending arm 25 engaging the periphery of the cylinder 16, and this depending arm 25 is held into engagement with the cylinder 16 by means of a split clamp or band 26. A hood 27 is formed with the guide member 24 and extends across the path of the piston or valve member 18, and the top of this valve member 18 is adapted to engage the hood or stop member 27 when the valve is in open position. This hood 27 is disposed on a downward inclination, and when the valve 18 is in closed position as where the fuel supply fails entirely or has dropped to a predetermined point, the ball or valve locking member 22 will roll down the guide 24 and will be forced onto the top 21 of the valve 18 by means of the ball 23. The diameter of the ball 22 is such that it will be wedged between the hood 27 and the top 21 of the valve 18, as shown in Figure 1 when the valve is closed.

By providing two of these balls 22 and 23, the first or innermost ball acts as a valve locking member while the second or outermost ball acts to gravitatingly force the first or locking ball into locking position.

A releasing or unlocking rod 28 is slidable through the cylindrical wall 11 of the housing and is slidably mounted in a gland 29 and is constantly urged into inoperative position by means of a spring 30 which engages at one end against the gland 29 and at the other end against a nut or head 31 carried by the outer end of the releasing member 28. This releasing rod 28 is disposed in a position between the top of the cylinder 18 and the hood 27, and when this member 28 is moved inwardly, as shown in dotted

lines in Figure 1, the locking ball 22 will be forced out of the path of the piston 18. If the pressure in the fuel supply line is normal, the pressure will raise the piston 18 as soon as the ball 22 is moved to one side and into the guide member 24. The fuel pressure will thereafter maintain the plunger or piston 18 in open position and the plunger or piston 18 will hold the balls 22 and 23 in the guide member 24, as shown in Figure 2.

The device herein disclosed, as will be noted from the drawing, is exceedingly simple in construction so that it can be manufactured at a relatively small cost, and due to the simplicity of its construction it can be manufactured in various sizes so that it can be placed in any desired fuel supply line and at any point within the line where a valve opens the supply line to an outlet such as a burner or the like. The device is particularly adapted for use with stoves, heating elements or the like so that when the fuel supply fails or the pressure is below normal, the fuel will be cut off to the burner and when the fuel pressure again becomes normal, the fuel will not be delivered to the burner until the safety valve herein disclosed has been manually moved into open position.

In the use and operation of this device, the housing 10 is adapted to be interposed in the fuel supply line and is preferably mounted in a vertical position so that the valve or plunger 18 will gravitatingly fall into closed position when the fuel pressure is below normal and so that the valve locking member 22 will gravitatingly move into locked position upon lowering of the plunger 18. The weight of the valve 18 is such that the normal pressure in the supply line will hold this valve in uppermost or open position, as shown in Figure 2, and in this position, the valve locking member 22 is disposed at one side of the valve and in the guide member 24.

When the pressure in the supply line fails or falls below normal, the plunger 18 will gravitatingly fall into closed position so that the marginal portions of the plate or top 21 will rest on the valve seat constituting the upper end of the cyl-

inder 18. At the same time the valve 18 drops into closed position, the valve locking member 22, under the force of the ball 23, will be moved across the top 21 of the valve and wedged between this top and the hood 27. After this locking member 22 has been moved into locked position, should the fuel pressure be brought to normal again, the fuel will be prevented from passing the valve 18 by the locking member 22.

In order to permit the fuel to pass through the housing, the releasing member 28 is moved inwardly so that the ball 22 will be manually forced to one side of the plunger 18, whereupon the spring 30 will force the releasing member 28 outwardly to the limit provided by the stop 32 on the member 28.

What is claimed is:—

A safety valve, comprising a housing having an intake port and an outlet port, a cylinder communicating with the intake port and having a valve seat at the upper end thereof, a hollow valve slidable in the cylinder and maintained in open position by the normal pressure of the fuel supply line, said valve having a plurality of discharge ports therein, a guide member supported above the cylinder and inclined to the top of the valve, a hood disposed above the cylinder and inclined to the top thereof, a locking member movable in said guide member and adapted to gravitatingly move downwardly into wedging engagement between the hood and the top of the valve upon reduction of the fuel pressure in the cylinder, means movable in said guide member for gravitatingly forcing the lock and member across the top of the valve and wedging the locking member between the hood and the valve, and means disposed intermediate the top of the cylinder and said hood to manually move said locking member into released position, said locking member engaging the periphery of the valve when the pressure is normal and the valve is in fully opened position and being held in released position by said valve.

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