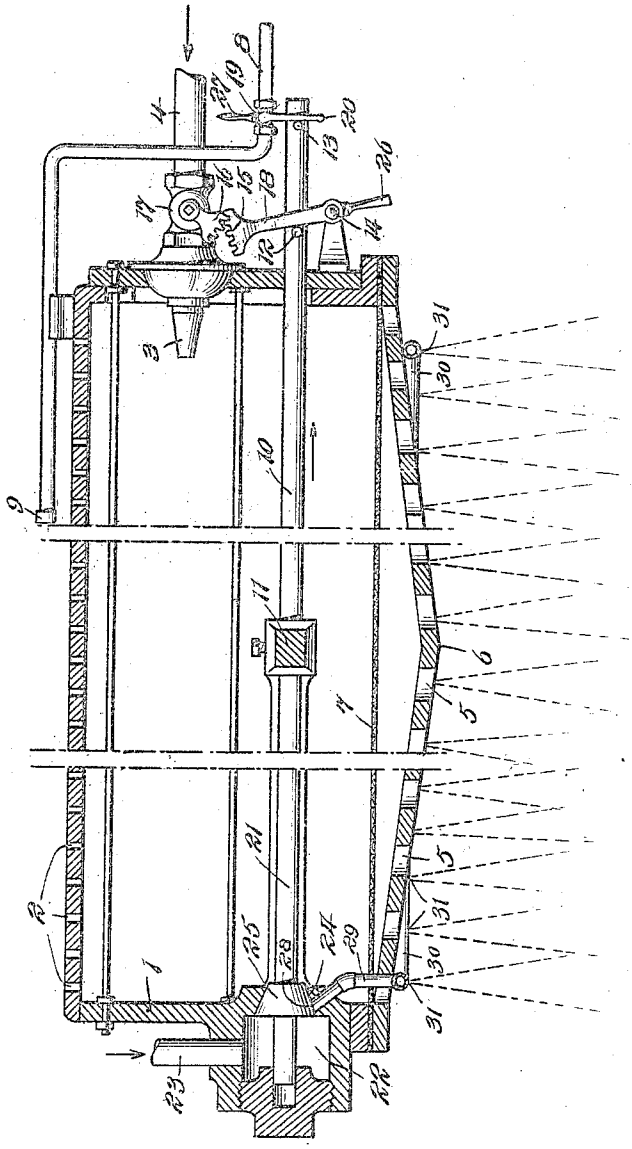
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SAFETY DEVICE FOR HYDROCARBON BURNERS.

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1,377,873.

Patented May 10, 1921.



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SAFETY DEVICE FOR HYDROCARBON-BURNERS.

1,377,873. Specification of Letters Patent. Patented May 10, 1921.

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To all whom it may concern:

Be it known that I, WILLIAM H. CHADICK, a citizen of the United States, residing at Suffern, county of Rockland, and State of New York, have invented certain new and useful Improvements in Safety Devices for Hydrocarbon-Burners, of which the following is a full and clear specification illustrated in the annexed drawings. The particular novel features of my invention are more fully pointed out in the annexed claims.

My invention relates to a safety device for extinguishing accidental fires which may occur in hydro-carbon burners, due to leakage of the fuel nozzle at times when the burner is not in use. This device is of particular importance in hydrocarbon burners such as are used in steam propelled vehicles or water craft, whereby the frequent stopping of the engine and the shutting off of the fuel, incidental thereto, small amounts of liquid fuel are likely to drip from the fuel nozzle, such wastage being likely to be ignited by the pilot light.

In the accompanying drawing is illustrated, in longitudinal vertical section, a burner for liquid hydrocarbon such as is used for instance in steam propelled vehicles. The two ideas involved in my invention are: to automatically shut off the fuel supply close to the mouth of the fuel jet when an accidental fire occurs; and further to automatically operate means for extinguishing such accidental fire, both automatic means to be actuated by occurrence of the fire itself. These ideas are reduced to practice in the following manner:

In the drawings, 1 represents the housing of a hydrocarbon burner which is provided at its upper side with orifices 2 on which the flames are formed during the normal operation of the burner. The liquid fuel is supplied into this housing by the nozzle 3 fed with fuel from the supply pipe 4. Air is supplied through the bottom 6 of the housing which for this purpose is provided with air holes 5. The bottom 6 is dipped toward the center of the burner for the purpose to be described presently. From an auxiliary supply pipe 8 a pilot burner 9 is supplied with fuel, the pilot burner being arranged above the top of the burner as shown in the drawings. The aforementioned construction of the burner is merely conventional and not part of the present invention. If now for instance, the vehicle is stopped and the fuel supply is shut off from nozzle 3 by a valve, not shown here, in order to extinguish the burner, it usually occurs that some of the fuel remaining in the nozzle, leaks out and in passing through the hot burner casing is ignited by the pilot light. It frequently will also drip through air holes 5 in burning condition, on to the ground or into the pan usually arranged underneath the burner. To prevent, in the first place, this co-called spill fuel from conveniently escaping through the bottom of the burner, I have stretched across the inclined bottom 6 a fine mesh wire screen 7 on which the spill fuel lands. The upwardly directed draft is then likely to arrest the downward escape of the fuel, so that it will burn on the screen 7 inside of the burner casing. Now, in order to prevent the nozzle from further spilling any fuel, I have arranged inside of the burner casing, a thermostat rod 10 which is anchored at one end in a cross bar 11 suitably arranged in housing 1. The free end of rod 10 protrudes through one side of housing 1 and is provided at this outer end with two cross pins 12 and 13. Pin 12 abuts against the lever 18, suitably fulcrumed at 14 and whose upper end carries a toothed segment 15 which meshes with a toothed segment 16 fastened to a cock 17 placed into fuel supply line 4 closely adjacent to nozzle 3. So long as thermostat rod 10 is cold and contracted, lever 18 stands in the position shown, and cock 17 is open. If now, fuel should be spilled on to screen 7 and be accidentally ignited the flames will heat rod 10 and cause its expansion, by which pin 12 pushes lever 18 to the right and causes cock 17 to close and prevent further spilling of the contents of fuel supply pipe 4.

It is of course to be understood that the specific means herein described is merely illustrative. For example while the screen 7 is described as the means for catching the spilled fuel, it is apparent that other or no means may be provided, the invention relating to the prevention of danger from an accidental fire, whatever be the object upon which the fuel lodges, which might cause danger.

Similar means are provided for simultaneously preventing the spilling of fuel from pilot burner 9 for which purpose a

cock 19 is provided in auxiliary fuel pipe 8 which has a downwardly extending lever 20 abutting against pin 13 of the thermostat rod 10. Thus, when cock 17 of the main fuel pipe 4 is closed by the expansion of the thermostat rod 10, cock 19 is also closed.

The means for extinguishing a fire accidentally started on screen 7 by the spilled fuel are as follows: On cross bar 11 is anchored a similar thermostat rod 21 substantially extending in opposite direction, but in axial alinement with rod 10. The outer end of rod 21 extends into the steam chest 22 supplied with live steam from the boiler or any other suitable means through pipe 23. Chest 22 communicates with the interior of the burner housing through an opening 24 controlled by valve 25 mounted on the thermostat rod 21. So long as rod 21 is contracted, valve 25 is seated and thus prevents steam from escaping into the interior of burner housing 1. If, however, through an accidental fire on screen 7, rod 21 is expanded, valve 25 is opened and permits live steam to escape into the burner housing where it smothers the flames therein. In order to also insure the smothering of any flames that might emanate from spilled fuel which has escaped through screen 7 and air holes 5 and which may be burning on the ground, I have provided piping 30 extending along the underside of bottom 6, as shown. This piping is connected through branch 29 with the steam supply from chest 22 in such manner that branch 29 is supplied with steam as soon as valve 25 is moved from its seat as described before. For this purpose branch 29 may for instance terminate at the valve seat 24 so that it is normally closed when the valve is seated as shown in the drawings, and connected to chest 22 when the valve opens. Piping 30 is provided with a series of holes 31 at its underside, so that the steam escaping from these holes is directed downward to smother accidental fire started by the spill fuel on the ground.

As soon as the fire is extinguished in the burner housing, rod 21 contracts and the steam is automatically shut off, but rod 10 also contracting cannot open again cocks 17 and 19. This is not desirable, because otherwise fuel might again be spilled unintentionally into the burner casing and be accidentally ignited. Cocks 17 and 18 should only be opened by special means under independent control of the operator when he desires to again start the vehicle. For simplicity, I have indicated a handle 26 for lever 18 and a handle 27 for cock 19, by which means the operator may open these cocks at will so long as rod 10 is contracted.

It will be readily understood that during the normal operation of the burner the heat in the vicinity of thermostat rods 10 and 21 is not sufficient to expand these rods enough to perform the functions described above, because the air supplied to the burner through its bottom is sufficient to keep the two thermostat rods cool.

I claim:

1. Means for extinguishing accidental fires in liquid fuel burners, comprising a steam chest adapted to admit live steam to the interior of and about the burner, a valve in the chest for controlling such admission, and means exposed to the heat of the accidental fire for thermostatically operating said valve to direct live steam against the fire.

2. Means for extinguishing accidental fires in liquid fuel burners comprising a steam chest adapted to admit live steam to the interior of and about the burner, a valve in the chest for controlling such admission, and a thermostat rod automatically actuated by the heat of the accidental fire to apply the force of thermostatic expansion to said valve to open said valve and thereby direct live steam against the fire.

3. Means for extinguishing accidental fires in liquid fuel burners, comprising a steam chest adapted to admit live steam to the interior of and about the burner, a valve in the chest for controlling such admission, and a thermostat rod automatically actuated by the heat of the accidental fire for opening said valve by expansion, to direct live steam against the fire, said rod automatically closing said valve when the fire is extinguished and the rod contracts.

4. Means for extinguishing accidental fires in liquid fuel burners, comprising a fuel supply nozzle, a valve disposed adjacent to the mouth of the nozzle, means automatically actuated by the heat of the accidental fire and connected to said fuel valve for closing it in case of accidental fire.

5. Means for extinguishing accidental fires in liquid fuel burners comprising a fuel supply nozzle, a valve disposed adjacent to the mouth of the nozzle, a thermostat rod automatically actuated by the heat of the accidental fire and connected to said fuel valve for positively closing it by expansion in case of accidental fire.

6. Means for extinguishing accidental fires in liquid fuel burners, comprising a fuel supply nozzle, a valve disposed adjacent to the mouth of the nozzle, a thermostat rod suitably fixed at one end, and in contact with said fuel valve at its free end, said rod being disposed in said burner in a position exposed to the heat of the accidental fire, for closing by expansion said fuel valve in case of such fire, said valve remaining closed after the fire is extinguished and the rod is contracted.

7. Means for extinguishing accidental fires in liquid fuel burners, comprising a fuel supply nozzle, a valve disposed adjacent to the

mouth of the nozzle, a thermostat rod suitably fixed at one end, and in contact with said fuel valve at its free end, said rod being disposed in said burner in a position exposed to the heat of the accidental fire, for closing by expansion said fuel valve in case of such fire, said valve remaining closed after the fire is extinguished and the rod is contracted, and means independent of said thermostat rod for opening said fuel valve when the rod is contracted.

8. Means for extinguishing accidental fires in liquid fuel burners, comprising a fuel nozzle having a fuel valve adjacent to its mouth, a steam chest adapted to admit live steam to the interior of and about the burner, and a steam valve for controlling such admission, a double thermostat rod, anchored midway between its ends in the burner casing in a position exposed to the heat of the accidental fire, one of the rod ends coöperating with said fuel valve, the other end being connected to said steam valve, said thermostat, in case of accidental fire, closing by its expansion said fuel valve and simultaneously opening said steam valve, said steam valve being closed by the thermostat end connected to it, but said fuel valve remaining closed after the fire is extinguished and the thermostat rod is contracted.

9. Means for extinguishing accidental fires in liquid fuel burners, comprising a fuel nozzle having a fuel valve adjacent to its mouth, a steam chest adapted to admit live steam to the interior of and about the burner, and a steam valve for controlling such admission, a double thermostat rod, anchored midway between its ends in the burner casing in a position exposed to the heat of the accidental fire, one of the rod ends coöperating with said fuel valve, the other end being connected to said steam valve, said thermostat, in case of accidental fire, closing by its expansion said fuel valve and simultaneously opening said steam valve, said steam valve being closed by the thermostat end connected to it, but said fuel valve remaining closed after the fire is extinguished and the thermostat rod is contracted, and means independent of said thermostat rod for opening said fuel valve when the rod is contracted.

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