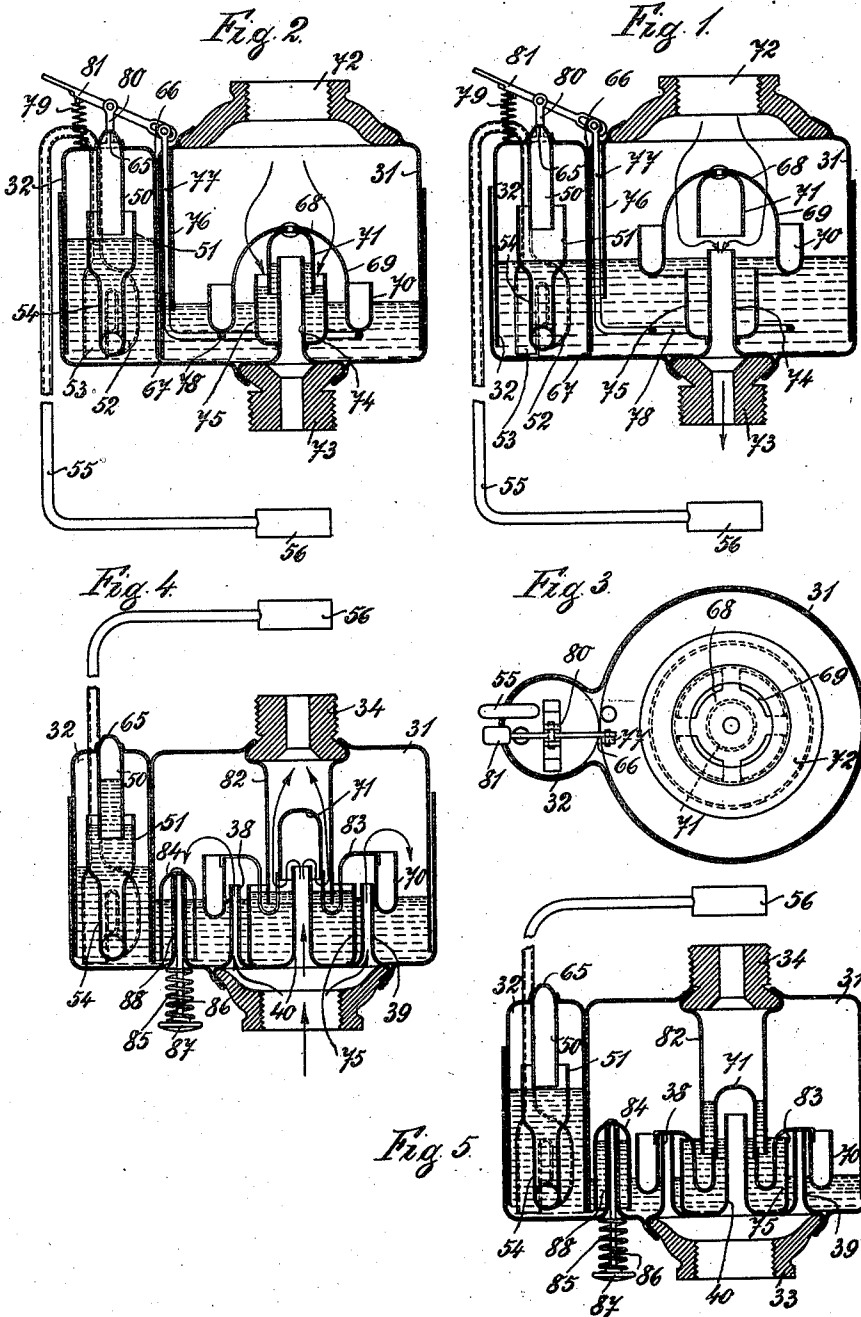


F. HUTTENLOCHER.
SAFETY DEVICE FOR GAS LAMPS.
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Patented Sept. 17, 1912.



Witnesses:
L. H. H. H.
C. A. Brown

Inventor:
Friedrich Huttenlocher
by
Foster Furman Watson & Co.
Attorneys

UNITED STATES PATENT OFFICE.

FRIEDRICH HUTTENLOCHER, OF CHARLOTTENBURG, GERMANY.

SAFETY DEVICE FOR GAS-LAMPS.

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Specification of Letters Patent.

Patented Sept. 17, 1912.

Original application filed August 17, 1911, Serial No. 644,659. Divided and this application filed April 15, 1912. Serial No. 690,749.

To all whom it may concern:

Be it known that I, FRIEDRICH HUTTENLOCHER, a subject of the King of Wurttemberg, and resident of 29 Gervinusstrasse, Charlottenburg, near Berlin, Germany, have invented a new and useful Safety Device for Gas-Lamps, of which the following is a specification.

This invention relates to certain modifications of the safety-device for gas burners and the like, described in the specification of my concurrent United States patent application Serial No. 644659 filed August 17th, 1911, and constitutes subject-matter divided out from said application.

In order that the invention may be clearly understood, reference is made to the accompanying drawings, whereon:—

Figure 1 is a vertical section of the safety device showing the position of the parts immediately after turning on the gas cock. Fig. 2 is a similar view showing the device in its cut-off position. Fig. 3 is a plan of Figs. 1 and 2. Figs. 4 and 5 show, in vertical section, a slight modification of Figs. 1 and 2, Fig. 4 showing the parts in the position assumed, when the gas burner is ignited, and Fig. 5 showing the device in cut-off position.

The device shown in Figs. 1 to 3, which is particularly intended for use in conjunction with heating apparatus, such as cookers and hot water boilers, comprises a cylindrical tank 31 preferably made in two parts telescoped together and a smaller lateral tank 32, the tanks 31 and 32 being separated by a partition 66 extending almost to the floor of the tanks so as to leave a small aperture 67 through which liquid can flow from one tank to the other. Within the tank 31 is arranged a bell 68 having apertures 69 in its crown and an annular trough-shaped float 70. Depending from the crown of the bell is a cap 71 which is inverted over a cup 75 which is carried by a central pipe 74 directly connected to the gas outlet connection 73 which in this case is arranged beneath the apparatus, while the inlet gas connection 72 is arranged above the apparatus. Depending into the side tank 32 is an air outlet tube 50 constricted at its upper end at 65 and opening at its lower end into the widened upper end 51 of a tube 54 which is provided with upwardly and downwardly directed arms 52 and 53 in direct connection

with the tube 54. The downwardly directed tubular arm 53 is open at its lower end and communicates at its upper end with a tube 55 terminating at its other end in a thermostatic device 56 which in this case is shown as a closed cylindrical chamber. A tube 76 extends downwardly from the cover of the tank 31 and through this tube 76 passes a resetting device which comprises a rod 77 terminating at its lower end in a ring 78, the rod 77 being in slotted connection with a double-armed lever 81 pivoted to a bracket 80 on the tank 32, the lever 81 being under the action of a spring 79.

The operation of the foregoing construction is as follows:—If gas enters through the connection 72 into the tank 31, the level of liquid in the tank will be depressed by the pressure of the gas, causing the liquid to gradually escape through the small aperture 67 into the side tank 32, thus preventing the bell 69 and float 70 from falling too rapidly. At the same time air will escape through the throttling aperture 63 of the air tube 50 within the tank 32, while gas will pass through the aperture 69 in the bell 68 and through the tube 74 to the outlet gas connection 73. The liquid and air-brake enables sufficient time to elapse for the gas to be ignited before the supply is cut off, and on the gas being ignited, the thermostatic device 56 will come into operation and the expansion of the fluid therein will cause the liquid in the tube 54 to rise in the enlarged upper part 51 until the outlet of air through the pipe 50 is cut off, thus preventing further exit of air, which at the same time prevents liquid in the tank 31 from passing into the tank 32. If however the gas is not ignited, or becomes extinguished without the closing of the burner gas cock, the thermostatic device will not come into operation and consequently liquid will continue to pass from the tank 31 to the tank 32 until the bell 69 and float 70 sink to such an extent that the cap 71 is immersed in the liquid in the cup 75 whereupon the supply of gas will be cut off. In order to subsequently light the burner, the bell must be lifted and this may be effected by depressing the free end of the lever 81 to raise the ring 78.

The device illustrated in Figs. 4 and 5 is similar to that illustrated in Figs. 1 to 3, but differs in that the gas inlet connection 33 and outlet connection 34 are arranged be-

low and above the apparatus respectively. In Figs. 4 and 5 moreover three inlet tubes 38, 39 and 40 are provided. Downwardly extending from the connection 34 is a tube 82 and between this tube and the gas inlet tube 40 is a cap 71, which in this case is supported in position by means of bent wires 83 secured to the float 70. The resetting device in this case is shown as comprising a dome 84 immersed in the liquid in the tank 31, the dome 84 being carried by a spindle 86, having an operating knob 87, said spindle passing through a tube 88 and being held under the action of a spring 85. Otherwise the construction of the tanks 31 and 32 is similar to that illustrated at Figs. 1 to 3.

The operation of the foregoing device is as follows: If the burner cock in the piping leading to the connection 33 is opened, gas will enter the tank 31 through the tubes 38, 39, 40 the gas entering through the tube 40 passing through the gas connection 34 by way of the tube 71. The gas pressure in the tank 31 will cause the level of liquid therein to sink, the liquid passing through into the tank 32, as hereinbefore described with reference to Figs. 1 to 3, and air will be throttled in its escape through the opening 65 of the pipe 50. The sinking of the float 70 will thus gradually take place and if the gas is ignited, the thermostatic device 56 will in the manner hereinbefore described raise the level of water in the enlarged pipe 51 so as to close the air outlet pipe 50 and thus prevent outlet of air therethrough and consequently prevent the further flow of liquid from the tank 31 to the tank 32. The arrangement will then be in the position illustrated in Fig. 4. If however the gas is not ignited or becomes unintentionally extinguished, the liquid from the tank 31 will continue to pass into the tank 32 and the level of liquid in the tank 31 will consequently fall and with it the float 70, until the cap 71 is immersed in the liquid in the cup 75, thus cutting off the supply of gas. To reset the device, the tube 84 is raised by pressing the spindle 86 upwardly, whereupon the dome will be raised above the level of liquid in the tank 31 and gas will enter the dome 84 so that the gas pressure will be somewhat reduced and at the same time the level of the liquid in the tank 31 slightly increased, sufficient to raise the float 70 and with it the cap 71 above the level of the liquid in the cup 75 whereupon gas may again pass to the connection 34 from the pipe 40.

I claim:—

1. Device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, gas inlet and outlet connections opening above the liquid in said tank, a liquid outflow connection enabling the escape of liquid on the admission of gas to the

space above the liquid in said tank, a float in said liquid, a gas cut off member supported by said float and adapted to cut off the gas supply on the diminution of the level of the liquid in said tank, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank, and means for raising said float.

2. Device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, gas inlet and outlet connections opening above the liquid in said tank, a liquid outflow connection enabling the escape of liquid on the admission of gas to the space above the liquid in said tank, a float in said liquid, a liquid seal normally permitting the inlet and outlet of gas, said float operating said liquid seal to cut off the gas supply on a diminution in the level of the liquid in said tank, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank, and means for raising said float.

3. A device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, an inlet gas connection opening above the liquid in said tank, central inlet and outlet gas connections, a central liquid cup, a cap inverted over said cup, a liquid outflow connection enabling the escape of liquid on the admission of gas to the space above the liquid in said tank, a float in the liquid in said tank and supporting said cap, said float being lowered by a diminution in the level of the liquid in said tank so as to immerse said cap in the liquid in said cup and thereby cut-off the gas supply, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank, and means for raising said float.

4. Device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, gas inlet and outlet connections opening above the liquid in said tank, a liquid outflow connection enabling the escape of liquid on the admission of gas to the space above the liquid in said tank, a fluid brake for braking the outflow of said liquid, a float in said liquid, a gas cut off member supported by said float and adapted to cut off the gas supply on the diminution of the level of the liquid in said tank, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank, and means for raising said float.

5. Device for gas burners for preventing the escape of unburnt gas, comprising a liquid tank, gas inlet and outlet connections opening above the liquid in said tank, a liquid outflow connection enabling the escape of liquid on the admission of gas to the

space above the liquid in said tank, an air brake for braking the outflow of said liquid, a float in said liquid, a gas cut-off member supported by said float and adapted to cut off the gas supply on the diminution of the level of the liquid in said tank, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank, and means for raising said float.

6. A device for gas burners for preventing the escape of unburnt gas, comprising a liquid tank, a partition extending nearly to the bottom of said tank and dividing the tank into a main and a secondary compartment and leaving a restricted communication between said compartments, inlet and outlet gas connections to said main compartment, a float in the liquid in said main compartment, a gas cut-off device operated by said float when the burner gas cock is opened and the level of the liquid in said main compartment diminished by the pressure of the gas entering said tank, an air outlet in said secondary compartment, a thermostat actuated by the heat of the gas flame, means controlled by said thermostat for preventing the escape of air from said secondary compartment, and means for raising said float.

7. A device for gas burners for preventing the escape of unburnt gas, comprising a liquid tank, a partition extending nearly to the bottom of said tank and dividing the tank into a main and a secondary compartment and leaving a restricted communication between said compartments, inlet and outlet gas connections to said main compartment, a float in the liquid in said main compartment, a gas cut-off device operated by said float when the burner gas cock is opened and the level of the liquid in said main compartment diminished by the pressure of the gas entering said tank, an air outlet in said secondary compartment, a closed chamber adapted to be heated by the gas flame, piping from the said closed chamber, a looped pipe open to the liquid in said secondary compartment and connected to said piping, one arm of said looped pipe

opening into said secondary compartment around said air outlet pipe, liquid in said looped pipe adapted to seal said air outlet, and means for raising said float.

8. Device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, gas inlet and outlet connections opening above the liquid in said tank, a liquid outflow connection enabling the escape of liquid on the admission of gas to the space above the liquid in said tank, a float in said liquid, a gas cut off member supported by said float and adapted to cut off the gas supply on the diminution of the level of the liquid in said tank, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank and means for raising said float comprising a bell immersed in the liquid in said tank, a spindle extending through said tank for operating said bell and a spring retaining said bell in the liquid.

9. Device for gas burners for preventing the escape of unburnt gas comprising a liquid tank, a central inlet gas pipe opening above the level of the liquid in said tank, a central outlet gas pipe surrounding said inlet gas pipe and immersed in the liquid in said tank, a liquid cup surrounding said central inlet gas pipe, a cap inverted over said central inlet gas pipe, a plurality of inlet gas pipes around said liquid cup and opening into said tank above the liquid therein, a liquid outflow connection enabling the escape of liquid on the admission of gas to the space above the liquid in said tank, an annular float surrounding said inlet gas pipes and supporting said cap, a thermostat actuated by the heat of the gas flame, means operated by said thermostat for preventing the outflow of liquid from said tank and means for raising said float.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRIEDRICH HUTTENLOCHER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.