L. & H. SCHMIDT.

AUTOMATIC CUT-OFF FOR GAS.

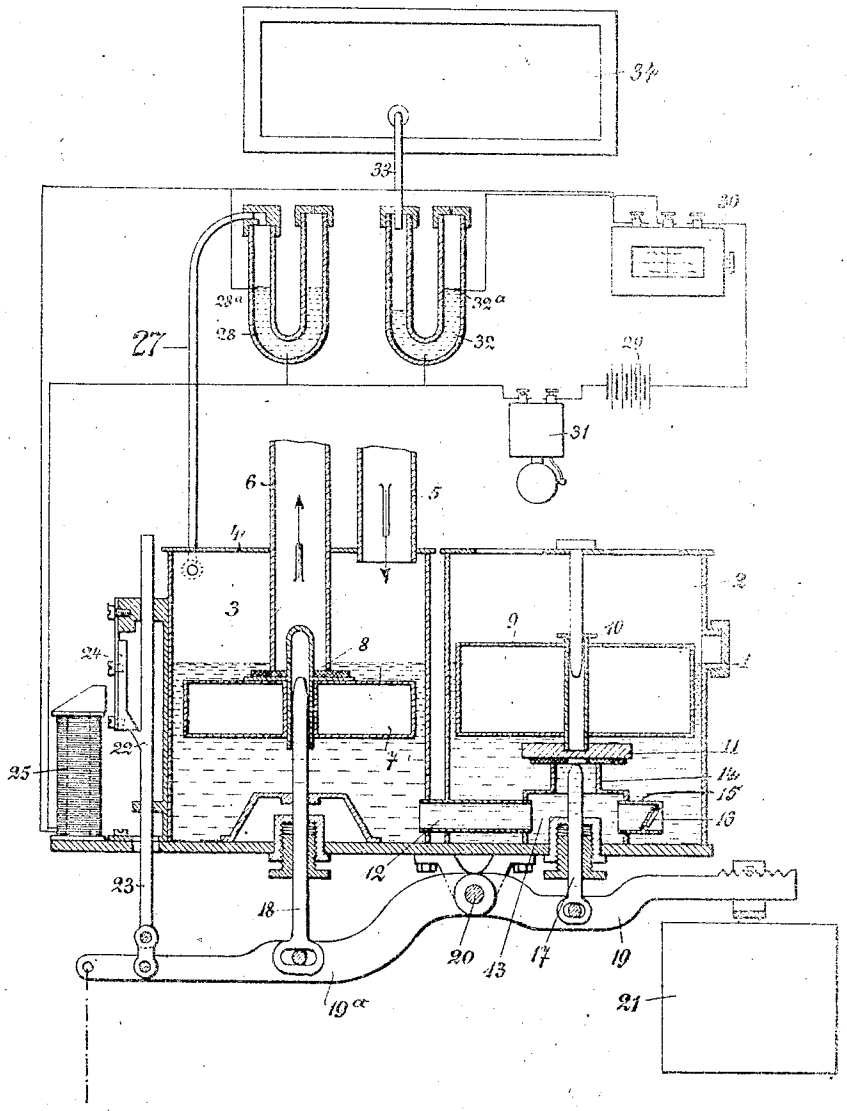
APPLICATION FILED MAR. 6, 1909.

921,897.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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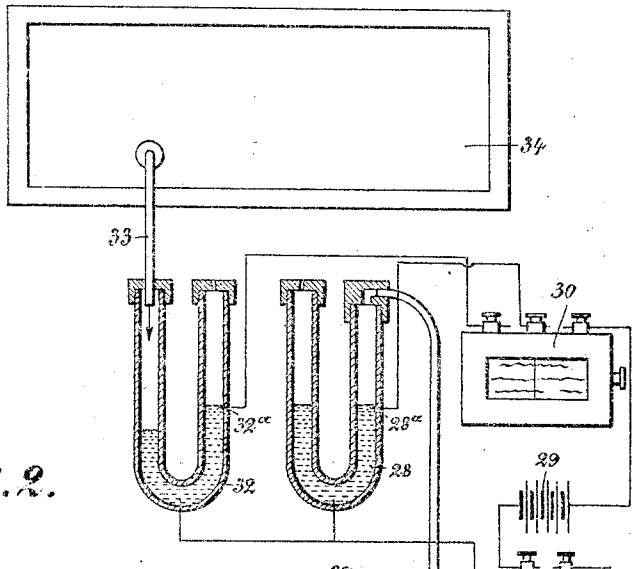


Fig. 2.

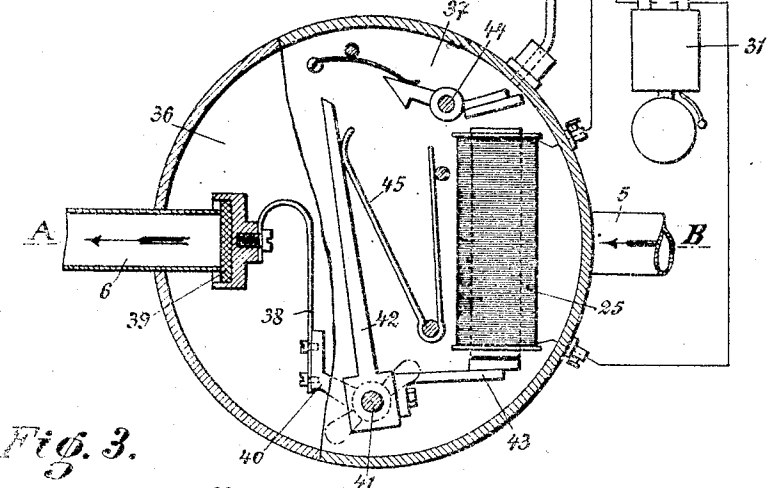
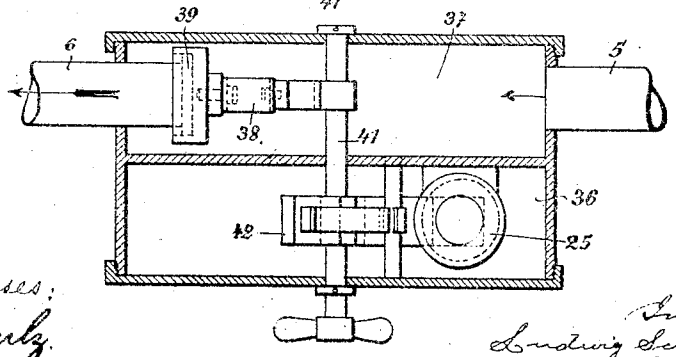


Fig. 3.



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UNITED STATES PATENT OFFICE.

LUDWIG SCHMIDT AND HERBERT SCHMIDT, OF KAISERSWERTH, GERMANY.

AUTOMATIC CUT-OFF FOR GAS.

No. 921,897. Specification of Letters Patent. Patented May 18, 1909.

Application filed March 6, 1909. Serial No. 481,626.

To all whom it may concern:

Be it known that we, LUDWIG SCHMIDT and HERBERT SCHMIDT, both living in the town of Kaiserswerth, Germany, have invented certain new and useful Improvements in Automatic Cut-Offs for Gas, of which the following is a specification.

The invention relates to an arrangement in gas-conduits, for closing said conduit if the gas-pressure should happen to become so low that the flames may extinguish or that an explosion may become possible.

The accompanying drawing shows two specific forms of this new invention.

Figure 1 shows in section and partly in elevation one form of executing the invention and Fig. 2 the second form. Fig. 3 is a section of Fig. 2 on line A B.

The arrangement, shown in Fig. 1 consists of two chambers or receivers 2 and 3, filled with a fluid up to the filling-pipe 1 which can be closed. Receiver 3 can be closed gas-tight by means of the cover 4. A pipe 5 goes to the receiver 3 for the purpose of letting in gas and a pipe 6 allows the gas to escape. The receiver 2 is likewise closed by means of a cover, this latter however not being air-tight. In the receiver 3 there is a floater 7 having a hole in its center, this floater being provided with a valve 8. The weight of the said floater together with that of the valve is just great enough to keep the floater immersed in the fluid to its surface. Within the receiver 2 there is a floater 9, having a hole in its center, through which hole a flanged pipe 10 passes, at the lower end of which the weight 11 is fastened, provided with the gas-check-ring and serving as valve. The receivers 2 and 3 are connected by a pipe 12, leading directly into the receiver 3, whereas within the receiver 2 it leads into a special chamber 13. This chamber 13 has in its upper part an open pipe 14 which may be closed by means of the valve 11, and in its side part said chamber 13 has another pipe 15, in which a return-valve 16, opened toward the interior of the chamber, is provided. The pins 17 and 18, tightened by means of stuffing-boxes, go through the bottom of both receivers, said pins being hinged to a lever 19—19ª. This lever, being pivoted at 20, has on its arm 19 a weight 21, whereas the other arm 19ª is movably connected with the rod 23, this latter being provided with a nose 22. Above the nose 22 there is a springing arm 24 and at the side of this, there is an electro-magnet 25. The receiver 3 is connected by means of a pipe 27 with another U shaped pipe 28, made of non-conducting material. This pipe 28 is filled with quick silver up to a certain height and connected with an electric battery 29. Above the quick silver there is a contact 28ª within the receiver, this contact being connected with the electro-magnet 25 and the battery 29. A switchboard 30 and an electric bell 31 may be inserted in the electric line. By the side of the pipe 28 there is another pipe 32 filled with quick silver or the like, having the same shape as the first one and being in the same manner connected with the electro-magnet and the battery. Into this pipe, a pipe 33 discharges, going to the so-called diffusion-chamber 34 composed of clay or other porous material.

The whole arrangement acts as follows: The gas, entering the receiver 3 through the pipe 5 tries to displace a part of the fluid, according to its pressure. The fluid, trying to go to the pipe 6, finds its way barred up by the floater 7 with its valve 8 and the way, leading to the receiver 2, is closed by the valves 11 and 16. For operating the apparatus, it is necessary to let the fluid go the way to 2. For this purpose the lever 19 19ª is pulled at its arm 19ª so far downward that the pin 17 of the lever-arm 19 pushes under the valve 11, lifting the same a little. Then the fluid can go off through 14 in 2 and ascend, so that the floater 9, rising together with the fluid, holds the valve 11 suspended over 14, by means of the flange. Then in the receiver 3 the fluid is allowed to sink, influenced by the gas entering the pipe 5, so that the floater 7, sinking together with the fluid, and its valve 8, leaves open the opening of the escape-pipe 6, allowing the gas to go to the different points where it is wanted. If then a reduction of the gas pressure occurs or if there be no gas pressure at all, the fluid goes back from 2 to 3 by way of 14 and 15 and through both 14 and 15 till the valve 11 closes the pipe 14, said valve 11 being arranged in such a way that it closes the entry 14 before the level of the fluids in both receivers has reached the same height. The remainder of the fluid goes only by way of 15 to 3, till liquids are on a level. When the fluid rises the floater 7 rises likewise and the valve 8 is put before the opening of the escape pipe 6, interrupting the passage of the gas till the valve 11 is lifted again by means

of the lever 19 19ª. In consequence of the gas pressure being too low or if there is no pressure at all, the quick silver will rise in one leg of the pipe 28, in which it had been pressed down before, by the gas. If the quick silver has risen up to the contact 28ª (the circuit being closed thereby) the arm 24 is attracted by the electro-magnet 25 and the rod 23, barred by the arm 24, is released. The lever 19 19ª, in consequence of its own weight, turns therefore upward with its arm 19ª, pressing by means of the pin 18 the valve 8 to its seat, so that the pipe 6 is closed, independent of the fluids rising in the receiver 3. At the same time the electric bell is set in motion and a plate falls down on the switchboard, announcing the danger. If within the room, where the diffusion chamber 34 is arranged, gas is accumulating in consequence of a pipe being broken or a valve left open, this gas, accumulating in the diffusion chamber, goes through the pipe 33 into one side of the pipe 32, pressing down the quicksilver in same and pressing the quicksilver upward in the other leg. If then the quicksilver rises to the contact 32ª, the circuit is closed in the same way as described, the arm 24 is attracted and the valve 8 closed, causing the plate on the switchboard to fall and the bell to ring.

The form shown in Figs. 2 and 3 is composed of a casing, which practically is divided into two chambers 36 and 37 by means of a gas-tight wall. Chamber 37 is provided with the gas inlet-pipe 5 and the escape pipe 6. This latter can be closed by means of the closing-plate 39, being provided with a check-ring and fastened to the spring 38. The spring 38 is fastened to the arm 40, which is connected firmly to a shaft 41 passing through both chambers. The shaft 41 has an angle-lever 42 43 within the chamber 36, one arm of which 42 is held fast by means of the latch 44, when the valve is open. The other arm 43 has on its end a piece of iron, serving as anchor. The valve 39 is closed by exciting the electro-magnet 25. This electro-magnet 25, when excited, releases the latch 44 and thereby the arm 42, so that the lever can be turned by a spring 45, the action of the spring being assisted by the force of the other magnet-pole, attracting the arm 43. By turning the lever, the shaft 41 and with it the arm 40 is turned in such a way, that the valve 39 is pressed on its seat and the pipe 6 is barred. In order to open the valve, the swivel, fastened at the end of the shaft 41 outside the casing, is turned to the right till the lever arm 42 catches behind the tappet 44. The circuit is closed as described in form No. 1 by means of a U shaped pipe 28, containing quicksilver or the like, the pipe 27 being connected by a pipe with chamber 37 or with the gas-piping.

Exactly as in form 1, a diffusion-chamber 34 is provided, being connected, by means of a pipe, with a second U shaped pipe 32 or the like containing quicksilver or the like, so that the electric circuit is closed when gas is accumulating in the rooms.

Instead of arranging one diffusion chamber, as represented in the drawing, there may be a great many of them, installed in the different rooms and coupled in quantity; in this way it is possible to announce gas accumulations, even if they occur in rooms far away. The switchboard giving the alarm the gas piping is closed, preventing any further escape of gas.

Having thus fully described our invention and in what manner the same is to be performed, what we claim and wish to secure by Letters Patent, is:

1. In an automatic cutoff for gas, a gas chamber having a gas inlet and a gas outlet, a valve controlling the gas outlet, an electro-magnet controlling said valve, a first electric contact and a second electric contact in circuit with said electromagnet, means for closing the first contact upon the decrease of pressure within the gas chamber, a diffusion chamber, and means for closing the second contact upon the entrance of gas into the diffusion chamber.

2. In an automatic cutoff for gas, a pair of gas chambers, a gas inlet and a gas outlet communicating with one of said chambers, a valve controlling the gas outlet, a float within each of the gas chambers, one of said floats being connected to the valve, while the other float controls communication between the chambers, an electromagnet having an armature which is operatively connected to the gas outlet valve, and a pair of contacts in circuit with the electromagnet.

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