E. ROTH.

SAFETY BURNER.

APPLICATION FILED MAY 7, 1908.

963,251. Patented July 5, 1910.

Fig. 1.

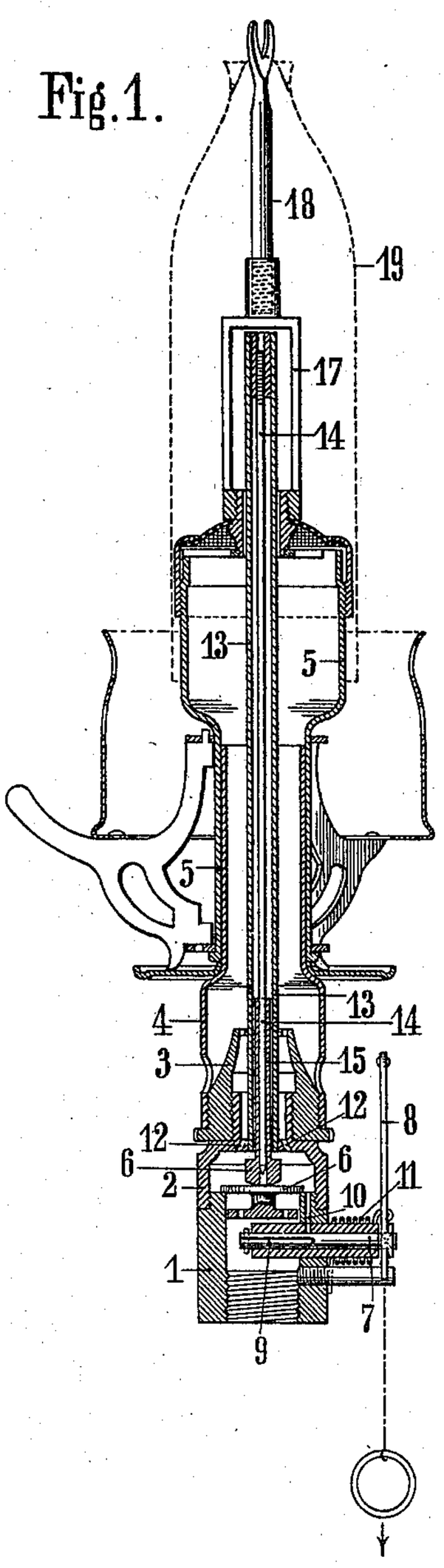
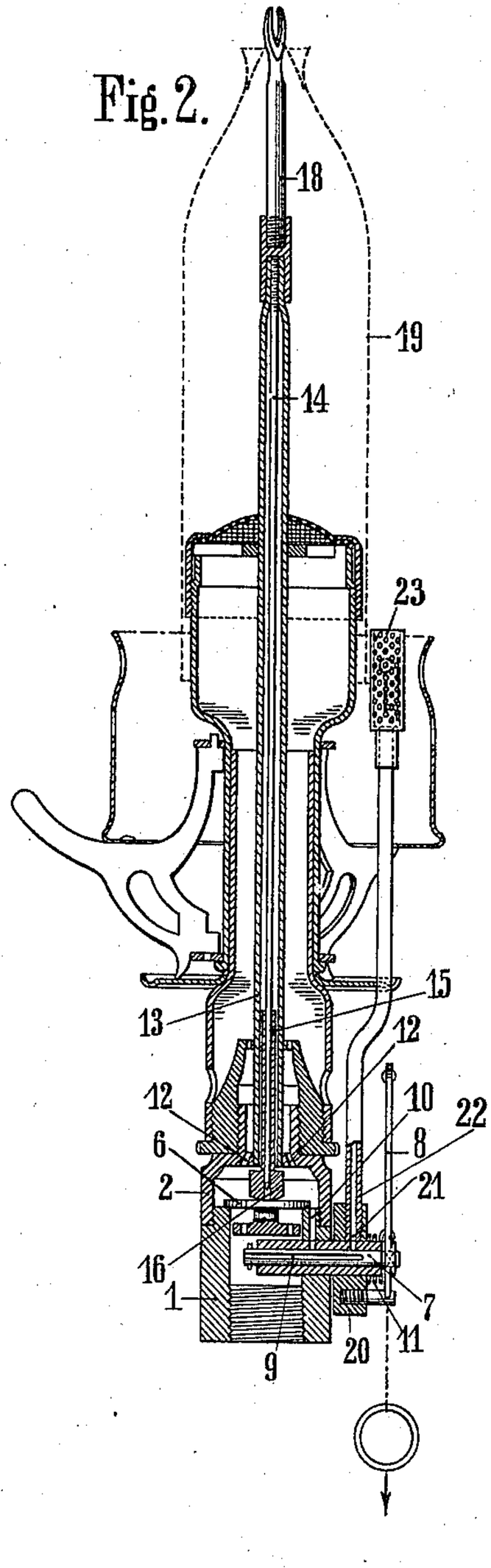


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SAFETY-BURNER.

963,251. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed May 7, 1908. Serial No. 431,332.

To all whom it may concern:

Be it known that I, EUGEN ROTH, a citizen of the German Empire, and resident of Schöneberg, near Berlin, Germany, manufacturer, have invented certain new and useful Improvements in Safety-Burners, of which the following is a specification.

This invention relates to safety burners, that is to say to burners in which the gas supply is automatically cut off after the flame fed by the latter is extinguished. The burner is of that kind in which the closing of the gas valve is effected by the difference of heat expansion of two bodies.

The object of this invention is to insure permanent reliable working of the burner and to remove the disturbance which in well known constructions takes place owing to the dimensions of the heat expansion bodies changing during the working. According to this invention, the said object is attained by giving to the valve controlling body such a clearance that it can at any moment adapt its position to the size of the heat expansion body without any idle working having to be overcome during the movement of the valve controlling body for the single starting of the burner, as is the case in well known devices, more particularly in those in which adaption to the changing dimensions of the expansion bodies is sought by inserting spring controlled parts.

Contrary to that which is the case in previously proposed devices with spring controlled elements, the valve controlling part in the construction according to this invention is arranged in an adjustable manner between stops and mounted to engage its support by friction.

A construction according to this invention applied to an incandescent gas burner is illustrated by way of example in the accompanying drawing.

Figure 1 is a vertical section through a burner made in accordance with my invention. Fig. 2 shows likewise in vertical section an alternate construction of the burner.

The gas supply branch is marked 1. It is provided at the top with a screwed on cap-like part 2, which carries the nozzle 3 with the mixing pipe 4. On the mixing pipe 4 is mounted in well known manner the burner pipe 5 proper.

On the mouth of the branch 1 is mounted a plate valve 6 forming the main valve for automatically shutting off the supply of gas to the burner on extinguishing the burner-flame. The branch 1 is provided with a cock 7 passing through its wall and provided with a handle 8. The cock is provided with a longitudinal groove 9 which can be brought into communication with a perforation or by-passage 10 for the gas in the wall of the branch 1, the said passage opening into the recess of the cap 2. A spring 11 has the tendency to keep the cock 7 permanently in a position in which the groove 9 is situated laterally of the perforation 10, so that the gas in passing through the groove 9, cannot get into the recess of the cap 2 through the perforation 10.

The cap 2 is connected by means of perforations 12 to the interior of the nozzle, and provided with a tubular heat expansion body 13, the inner hollow space of which is in communication with the hollow space of the cap 2. The heat expansion body 13 is connected at the top to a bar 14 which has preferably a smaller expanding property than the expansion body 13. The rod 14 carries at its lower end a sleeve 15 provided with a head 16 projecting into the hollow space of the cap 2. A certain amount of friction is present between the sleeve 15 and the rod 14. The heat expansion body 13 projects centrally through the burner head into a carrier 17 for the mantle support. The mantle fork is marked 18, and the mantle 19.

The working of the above described device is as follows: When it is desired to start the burner, gas is first supplied to the burner through the groove 9 of the cock 7 and the perforation or by-passage 10, which is effected by turning the handle 8 in opposition to the action of the spring 11. As soon as the gas supplied in that way to the burner has been lighted, the heat expansion body 13 is heated, which results in the raising of the rod 14, which, owing to its connection with the heat expansion body 13 at the upper part of the latter, participates in the expansion movement of the tubular body 13. The extent to which the rod 14 is thus raised, depends on the difference of the heat expansion between the tubular body 13 and the rod 14. Owing to the raising of the rod 14, the head 16 of the sleeve 15 which engages the rod with friction is lifted off the main valve 6. The valve 6 can, therefore, open under the pressure of the gas in the gas supply branch, so that the gas can pass to the

burner in the normal way through the perforation 12 in the cap 2. The raising of the head 16 is limited by the upper wall of the cap 2. When the burner is extinguished, the head 16 is lowered, and thus the valve 6 closed, owing to the cooling of the heat expansion bodies 13 and 14. The said closing can only be counteracted by again lighting the gas.

Owing to the adjustable arrangement of the sleeve 15 with the head 16, no disturbance of the working by the change in the dimensions of the expansion bodies 13, 14 can take place. Assuming that the expansion body 13 becomes lengthened after a certain period of time, the result will be simply that the rod 14 will be pulled out from the sleeve to a greater extent, as the position of the sleeve or of the head 16 relatively to the cap 2 of the gas supply pipe, which at the same time carries the lower end of the heat expansion body 13, cannot change. Whatever changes the expansion bodies may experience, the equalization takes place always in such manner that the sleeve shifts on the rod supporting it, while the extent of the opening movement of the valve closing head 16 always remains the same. That movement on which depends the opening or the closing of the valve takes place in the first stage both of the heating and of the cooling of the heat expansion bodies. The idle movement of the valve controlling part for equalizing the changes in the heat expansion bodies takes place only when the burner has started working properly.

The modified burner construction illustrated in Fig. 2 is distinguished from that of Fig. 1 substantially only in this respect that it is provided with a lighting burner. This modified construction is especially used if it is intended to light the gas by a self lighting device. Those parts of the burner of Fig. 2 which are also found in the construction of Fig. 1 are designated with the same reference numerals. Mounted on the casing of valve 7 is a carrier 20 for a lighting burner, such carrier being provided with a bore 21 which is adapted to communicate with the groove 9 of valve 7 in the same manner as the perforation or by-passage 10 and forming also a by-passage for the gas. Inserted into the bore 21 is the burner tube 22 of the lighting burner, such burner tube being shown as provided with a self lighting device 23. No separate carrier 17 for the mantle support is shown in connection with the modified construction of Fig. 2.

The operation of the modified construction of Fig. 2 is as follows: On opening cock 7 gas is supplied at the same time to the main burner through perforation 10 and to the lighting burner through perforation 21. The gas leaving the lighting burner tube 22 is lighted by the self lighting device 23 and the flame of the lighting burner lights the main burner. The so produced initial flame of the main burner heats the valve opening device in the same way as previously described and produces an opening of valve 6.

The valve controlling device of this invention may be used in connection with any kind of burner for lighting or heating purposes. It is also not essential that the heat expansion bodies should be arranged centrally relatively to the burner or centrally relatively to each other. The closing valve could also be directly connected with the adjustable sleeve, but this arrangement would be less advantageous as in that case a disturbance of the reliable closing of the valve would take place more easily should the valve carrier become bent by outside forces.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. In a safety burner a valve and a thermostatic operating device for same, said thermostatic operating device comprising two parts in sliding and frictional contact with each other and one of same in direct operative connection with said valve and adapted to be moved by heat action only within certain limits said valve comprising means limiting the movement of the valve in both directions.

2. In a safety burner a valve and a thermostatic operating device for same, said thermostatic operating device comprising two parts in sliding and frictional contact with each other and one of same contacting with said valve and adapted to be moved by heat action only within certain limits said valve comprising means limiting the movement of the valve in both directions.

3. In a safety burner a valve and a thermostatic operating device for same, said thermostatic operating device comprising a bar, a valve actuating body frictionally sliding on said bar, and contacting with said valve and adapted to be moved only within certain limits, a carrier for said bar, the bar being connected to said carrier at a distance from said sliding valve actuating body said valve comprising means limiting the movement of the valve in both directions.

4. In an incandescent safety burner a valve and a thermostatic operating device for same, said thermostatic operating device comprising a bar arranged centrally to the mixing tube of the burner, a valve actuating body sliding on and in frictional contact with said bar, a carrier for said bar adapted to be heated by the burner flame, the valve actuating body adapted to be moved by said carrying bar only within certain limits said valve comprising means limiting the movement of the valve in both directions.

5. In an incandescent safety burner a

valve and a thermostatic operating device for same, said thermostatic operating device comprising a bar arranged centrally to the mixing tube of the burner, a valve actuating body sliding on and in frictional contact with said bar, a carrier for said bar adapted to be heated by the burner flame, the valve actuating body adapted to be moved by said carrying bar only within certain limits and contacting with said valve said valve comprising means limiting the movement of the valve in both directions.

6. In an incandescent safety burner a main valve, a thermostatic operating device for same comprising a bar arranged centrally to the mixing tube of the burner, a sliding member and in frictional contact with said bar said sliding member in direct operative connection with said main valve and adapted to be moved by heat action only within certain limits, an auxiliary valve, a by-passage for the gas controlled by said auxiliary valve and hand operatable automatic means for keeping said by-passage normally closed by said auxiliary valve said valve comprising means limiting the movement of the valve in both directions.

7. In a safety burner a valve, a thermostatic operating device for same comprising two parts in sliding and frictional contact with each other and one of same in direct operative connection with said valve and adapted to be moved by heat action only within certain limits, and a by-passage for the gas adapted to coöperate with a gas self-lighting device said valve comprising means limiting the movement of the valve in both directions.

8. In a safety burner a valve, a thermostatic operating device for same comprising two parts in sliding and frictional contact with each other and one of same in direct operative connection with said valve and adapted to be moved by heat action only within certain limits, two by-passages for the gas, one leading to the burner proper and the other coöperating with a gas self-lighting device and an auxiliary valve controlling said two by-passages for the gas, and hand operatable automatic means for keeping said two by-passages normally closed by said auxiliary valve said valve comprising means limiting the movement of the valve in both directions.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EUGEN ROTH.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.