N. WISE.

SAFETY GAS BURNER.

APPLICATION FILED FEB. 11, 1907.

1,019,741. Patented Mar. 5, 1912.

Fig. 1

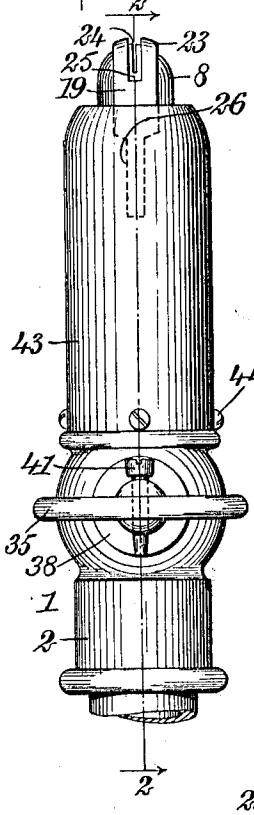


Fig. 5

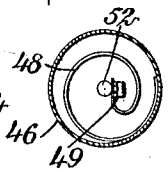


Fig. 6

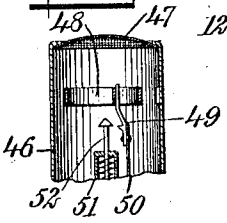


Fig. 2

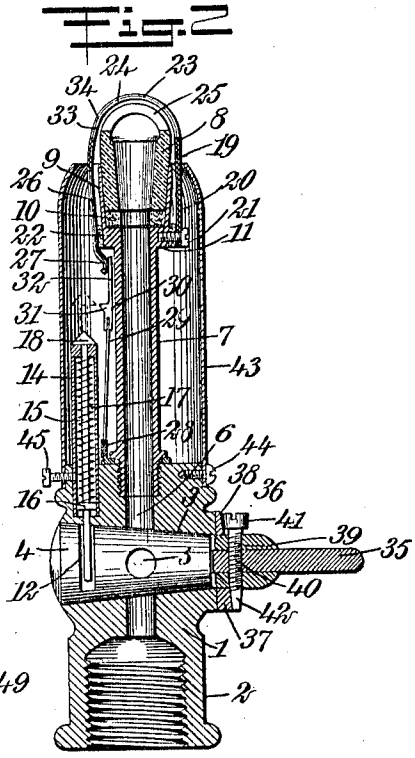


Fig. 3

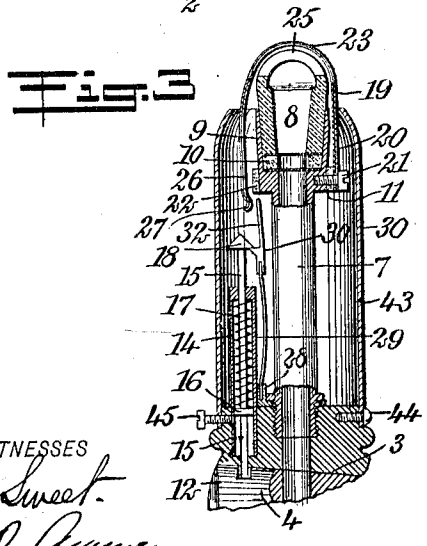
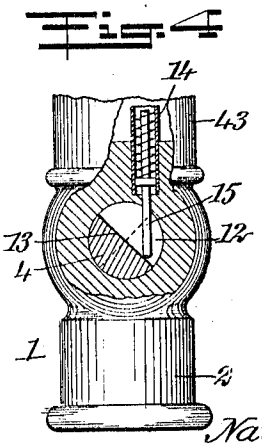


Fig. 4



WITNESSES

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SAFETY GAS-BURNER.

1,019,741. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed February 11, 1907. Serial No. 356,748.

To all whom it may concern:

Be it known that I, NATHAN WISE, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Safety Gas-Burner, of which the following is a full, clear, and exact description.

This invention relates to safety gas burners, and the object of the invention is to produce a device of this class which will operate automatically to shut off the gas in case the flame should become extinguished accidentally for any reason.

The general purpose is to prevent the occurrence of cases of asphyxiation or other accidents.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a burner constructed according to my invention; this view is upon a slightly enlarged scale; Fig. 2 is a vertical section through the burner taken on the line 2—2 of Fig. 1; this view shows the burner in its closed position, that is, with the gas turned off; Fig. 3 is a vertical section similar to Fig. 2, through the upper portion of the burner but showing the same in its open condition, that is, with the gas flowing, the gas being supposed to be lighted; this view especially illustrates the operation of the automatic device for closing the burner; Fig. 4 is a vertical cross section through the stop-cock of the burner and further illustrates the mechanism for closing the stop-cock when the frame is extinguished; Fig. 5 is a horizontal cross section through a burner of a modified construction; and Fig. 6 is a vertical section through a burner constructed as illustrated in Fig. 5.

Referring more particularly to the parts, 1 represents the body of an ordianry stop cock or gas cock, which is formed below into a sleeve 2 adapted to be screwed onto a gas fixture. This body 1 is provided with a conical bore 3 to receive a rotatable plug 4, said plug being provided with a transverse port 5 which may allow gas to pass upwardly through the duct 6 in the stop cock. On its upper side the body 1 is provided with a tube 7 which extends vertically upward, and is in communication with the duct 6 so as to conduct the gas, when turned on, to a tip 8. This tip 8 is of conical form and is seated in a socket 9 formed on the upper end of the tube 7, as shown. In the lower portion of the socket a ring 10 of non-conducting material, such as asbestos, is placed, upon which the tip 8 is seated. The lower end of the socket is of larger diameter than the body of the tube 7, so that at this point an enlargement or shoulder 11 is formed.

In the side of the plug 4 a transverse slot 12 is cut, the bottom 13 of the said slot lying substantially upon the diameter of the plug, as illustrated in Fig. 4; this slot is preferably formed near the large end of the plug, as indicated.

In the upper portion of the body 1 above the slot 12, I provide a guide 14 which is preferably of tubular form, and in this guide there is mounted a plunger 15, the lower end whereof extends downwardly into the slot 12 and rests against the bottom face 13 thereof. Near its lower end and within the tubular guide 14, the plunger is provided with a collar 16, and above this collar a spring 17 is disposed around the plunger. The upper end of this spring thrusts against the upper end of the tubular guide 14, and the lower end of the spring thrusts against the collar 16. In this way the spring operates normally to hold the plunger in a depressed position, at which time a conical head 18 which is formed on the upper end of the plunger, rests upon the upper end of the guide, as indicated in Fig. 2.

At the shoulder 11 I attach an expansion strip, device or thermostat 19, which thermostat presents a shank 20 which is attached, by means of a suitable screw 21, to the shoulder 11, the said shoulder being first provided with a ring 22 of non-conducting material such as asbestos. The upper portion of the expansion strip is curved over the tip 8 so as to form a bow 23, and this bow is formed with a slot 24 extending longitudinally of the slit 25 which is formed, as usual, in the tip 8. Beyond the bow 23 the thermostat is formed into a downwardly extending tongue 26, the lower portion whereof is of reduced width, as indicated

in Fig. 1 in the dotted lines. The lower end of this tongue 26 is bent inwardly so as to form a shoe 27 which normally lies adjacent to the side of the tube 7 as indicated in Fig. 2. In Fig. 2 the normal form of the thermostat is presented; that is, the form which the thermostat assumes when the gas is turned off and the burner is cold.

On the upper face of the body 1 a socket 28 is formed for the lower end of a leaf spring 29, and this leaf spring is provided at its upper end with a catch 30 having substantially the form shown, presenting a tooth 31 which projects in the direction of the plunger 15, and above this tooth 31 the catch is formed with an upwardly extending finger 32, and this finger, when the burner is cold and the gas is closed off, is pressed backward or away from the plunger by the shoe 27 of the thermostat or expansion strip.

It should be understood that the leaf spring 29 tends, by its resiliency, to move the catch 30 toward the plunger. The strength of this spring is not sufficient to overcome the pressure of the shoe 27. The expansion strip or thermostat is formed of two metals laid one over the other in a well understood manner; the inner metal strip 33 being preferably of brass, while the outer metal strip 34 is of steel or similar material. It will be remembered that brass has a higher coefficient of expansion than steel, from which fact it follows that if the temperature of the thermostat rises, the bow 23 of the thermostat will tend to straighten out, and in this way when the burner is lighted, the expansion strip tends to move toward a position such as that indicated in Fig. 3. As indicated in Fig. 4, the axis of the plunger 15 is disposed out of the plane of the axis of the plug 4, so that when the gas is turned on by means of a thumb-head 35, the plunger 15 will be raised. The plunger will be raised sufficiently to bring the head 18 just above the catch 30. As soon as the gas is lighted, the flame heats the thermostat, which immediately moves toward the position indicated in Fig. 3. In this way the pressure of the shoe 27 upon the finger 32 is relaxed, allowing the leaf spring 29 to follow it as it moves, so that the tooth 31 of the catch moves under the head 18 so as to prevent the return of the plunger by its spring; the plug is then left in this position. If the flame should become accidentally extinguished, the thermostat or expansion strip 19 immediately begins to move, and in a few seconds will resume substantially the position shown in Fig. 2. In this way the pressure of the shoe against the finger 32 releases the plunger from the tooth 31 of the catch 30, whereupon the plunger will be returned by its spring to its normal depressed position. In this movement of the plunger, its lower end rotates the plug of the stop cock, so that the face 13 moves from the position indicated in the dotted line in Fig. 4 to the position in which it is shown in full lines. In this way the plunger returns the stop cock to its "off" position.

It should be understood that in practice it is necessary that the plug of the stop cock should be rotated with great ease, as the spring 17 is necessarily not of great strength; for this reason I provide an adjusting device 36 which comprises a washer 37 which seats around the small end of the plug, and presents an inclined outer face 38. The end of the plug is formed with a slot 39 which receives the thumb-head 35, and through this end of the plug a screw 40 passes, which attaches the thumb-head in the slot, as indicated. The head 41 of this screw is of conical form, and its side face rests against the inclined face 38. The screw is also formed with a conical tip 42, the side of which rests against the inclined face 38 on the opposite side of the plug. Evidently, by adjusting this screw inwardly, the plug will be drawn inwardly in the bore, and in this way a very nice adjustment of the plug within the bore results. In order to allow for this adjustment, it will be observed that the slot 12 is of greater width than the plunger, which, of course, permits a longitudinal movement of the plug with respect to the plunger. The lower portion of the thermostat, the tube 7 and the plunger guide are completely inclosed in a bonnet 43, which is of substantially cylindrical form, crimped inwardly at its upper edge, as indicated. The lower edge of this bonnet is attached by suitable screws 44 to the upper portion of the body 1. Adjacent to the plunger 15 and in the upper portion of the body 1, a set screw 45 is mounted, and this set screw is adapted to be screwed through the wall of the guide, so that its end may come against the plunger. The purpose of this set screw is to enable the plunger to be locked in an elevated position in case the burner should become deranged in such a way as to prevent its operating automatically in the manner described above.

Where the invention is applied to a burner employing an incandescent mantle, I adopt the construction shown in Figs. 5 and 6. Such a burner comprises a cap 46 covered with gauze 47. On the inner side of the cap a spiral expansion strip 48 is attached, the inner end whereof lies adjacent to a catch 49 similar to the catch 30 aforesaid. This catch is attached to the upper end of a leaf spring 50 extending upwardly within the cap and fixed below to the body of the burner in any suitable manner. Central in the cap there is a guide 51 for a plunger 52, said guide and plunger being

substantially similar to those of the preferred form. The spring 50 tends to move the catch in to engage the head of the plunger, and is held away by the expansion strip when cold. When the expansion strip becomes heated, its inner end moves inwardly and permits the catch to engage the plunger.

Attention is called to the fact that the thermostat or expansion strip does not itself engage the plunger, but it operates only indirectly to affect the plunger. It is to be noted, also, that the expansion strip is perfectly free to contract and expand; that is, no material resistance is offered to its expansion and contraction. This is a very important feature, as I have found that all expansion strips the expansion of which is resisted in any way, tend to change their shape and throw themselves out of adjustment with the other parts. With the burner described, evidently the movement of the free end of the expansion strip is unobstructed. Consequently, it can become heated and cooled successively an indefinite number of times, without affecting the correspondence which exists between its form and the different temperatures to which it is subjected.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a burner, a valve, means for operating the valve to close it, a locking device for locking the valve operating means in inoperative position, an expansion device disconnected from the locking device and being free to expand unrestrained, said expansion device affording means for releasing said locking device in contracting.

2. In a burner, a valve, means for operating the valve to close the same, a spring actuated member for holding the valve operating means in inoperative position, and an expansion device having a free end, said free end being adapted to engage the spring actuated member but disconnected therewith.

3. In a burner, a valve, means for operating the valve to close it, an expansion device having a free end, and a spring member for controlling the valve operating means said member being fixed at one end and having its free end adapted to be engaged by the free end of the expansion device, but disconnected therewith.

4. In a burner, in combination, an admission device, a member tending to close said admission device, a catch detaining said member from closing said admission device, an expansion strip having an unobstructed free end, lying beyond said catch when heated and adapted to disengage said catch in cooling.

5. In a burner, in combination, a cock comprising a rotatable plug adapted to admit gas through said burner, a plunger adapted to be raised by the turning of said plug toward its open position, an expansion device adapted to be heated by the flame, a catch tending to engage said plunger to hold the same raised, said expansion device affording means for holding said catch away from said plunger, and a spring actuating said plunger to return said plug to its closed position.

6. In a burner, in combination, a body, a rotatable plug having a transverse slot in the side wall thereof, a plunger guided in said body and having its lower end resting in said slot, a spring pressing said plunger downwardly against said plug, said plunger being disposed out of alinement with the axis of said plug, whereby said plunger tends to return said plug when raised by the rotation thereof, an expansion device near the flame, and means controlled thereby for detaining or releasing said plunger.

7. In a burner, in combination, a body, a plug rotatable therein and having a transverse slot in the side wall thereof, a plunger guided in said body and having its lower end resting on the bottom of said slot, a spring pressing said plunger against said plug, an expansion device near the flame, and a catch tending to engage said plunger and normally held away from the same by said expansion device, said plug operating when rotated, to raise said plunger, said plunger being disposed out of alinement with the axis of said plug whereby the said plunger may return said plug.

8. In a burner, in combination, a body, a plug rotatably mounted therein, a plunger guided in said body, said plug affording means when rotated, for raising said plunger, an expansion device coöperating with said plunger to detain the same in a raised position, a spring tending to hold said plunger against said plug and affording means for returning said plug, and means for fixing said plunger in said body in a position withdrawn from said plug.

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

NATHAN WISE.

Witnesses:
F. D. AMMEN,
JNO. M. RITTER.