A. E. RUCHTY.

AUTOMATIC SAFETY VALVE.

APPLICATION FILED DEC. 7, 1918.

1,308,684.

Patented July 1, 1919.

2 SHEETS—SHEET 1.

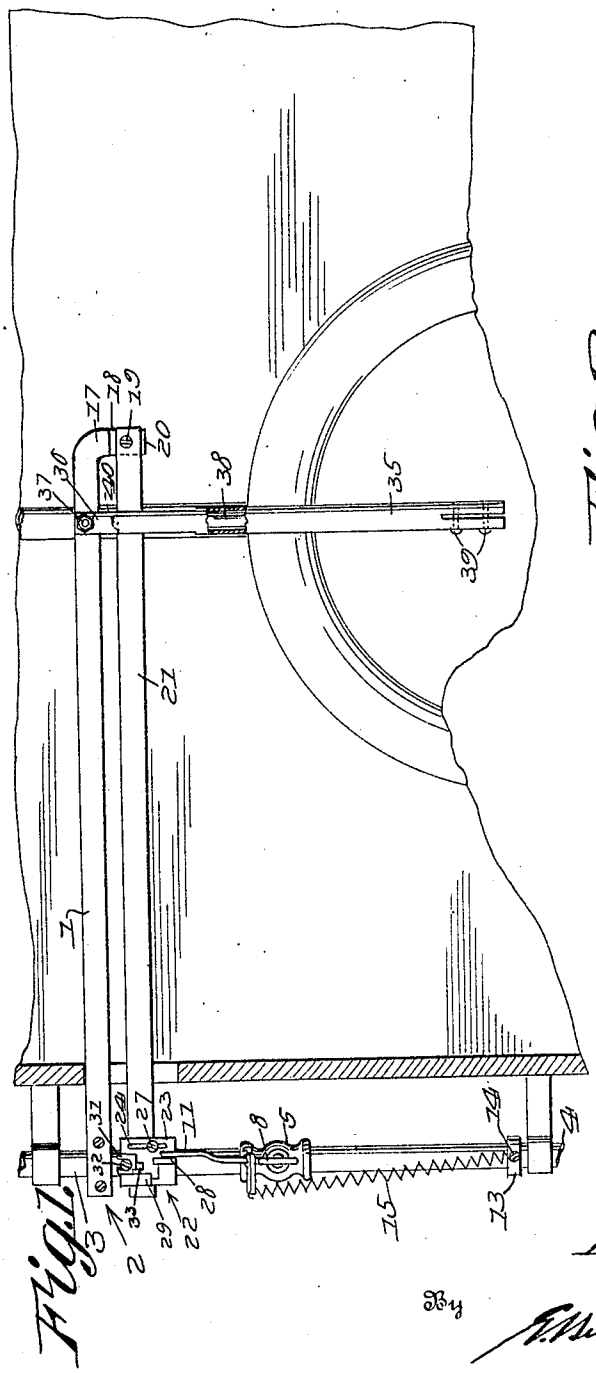


Fig. 1.

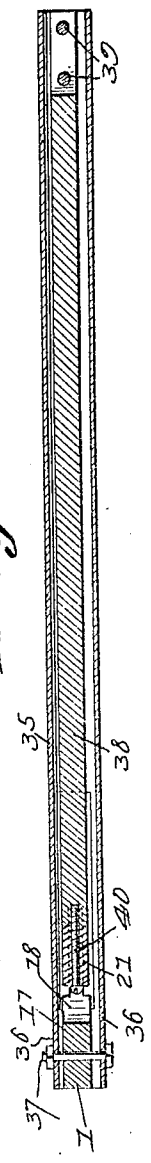


Fig. 2.

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2 SHEETS—SHEET 2.

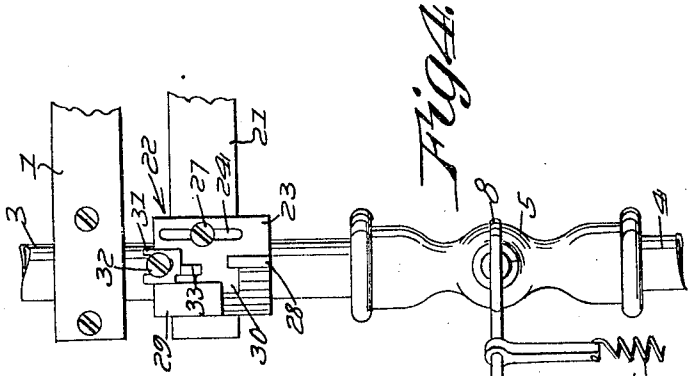


Fig. 4.

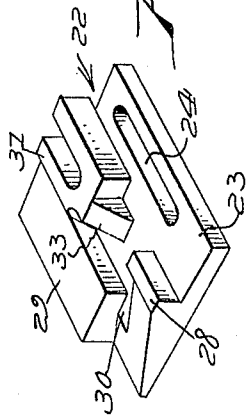


Fig. 6.

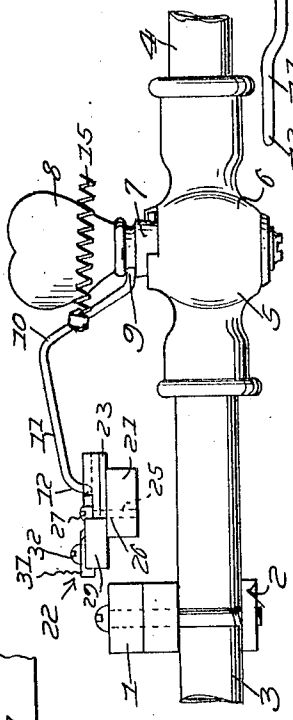


Fig. 7.

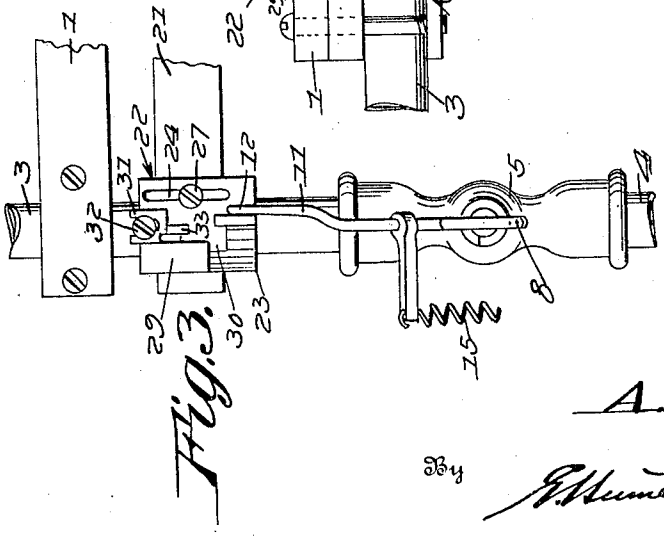


Fig. 3.

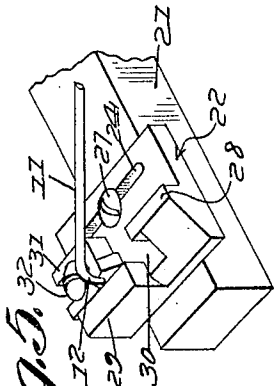


Fig. 5.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY-VALVE.

1,308,684. Specification of Letters Patent. Patented July 1, 1919.

Application filed December 7, 1918. Serial No. 265,713.

To all whom it may concern:

Be it known that I, ALEXANDER E. RUCHTY, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Automatic Safety-Valves, of which the following is a specification.

This invention comprehends generally improvements in gas stoves and burners and more particularly relates to an automatic safety valve.

The invention has for its primary object to provide a device of the above mentioned character designed to automatically shut off the flow of gas to the gas stove should the flow of gas through the pipes accidentally stop or should the gas be accidentally extinguished by a strong draft, thus preventing the escape of gas and the possible asphyxiation of persons.

As an equally important object this invention contemplates the provision of a valve of the above mentioned character constructed to automatically shut off the flow of gas into a gas stove should the stove become overheated to a danger point, thus preventing accidental fires in the house, etc.

The invention as a further improvement embraces the provision of a valve of the above mentioned character wherein the parts are of such a construction that the device may be readily set in an operative position and retained in such a position until the gas pressure becomes very low causing the light to be extinguished or until the light is extinguished by a strong draft or until the stove becomes overheated, at which times the parts automatically adjust themselves so as to release the valve proper, which is desirably of a spring actuated type, thereby assuring of the shutting off of gas through the supply pipe.

More particularly the present invention embraces the provision of a device of the above mentioned character wherein improved coöperative catch, retaining and guide means are provided for coöperating with the valve arm for releasably holding the valve in an open position, resilient means being incidentally employed in connection with the valve proper for insuring of the automatic closing thereof subsequent to its release.

More specific objects of this invention consist in the provision of a prime mover or expander of improved construction for controlling the movement of the combined catch and retainer carrying member; to also improve the construction of the combined catch, retainer and guide; and to provide improved means for adjustably connecting the guide with respect to the catch and retainer.

It is an additional object of this invention to provide a device of the above mentioned character which is simple in construction, thoroughly reliable and efficient in its purpose and inexpensive in manufacture.

Other objects will be in part obvious and in part hereinafter set forth.

The invention accordingly consists in the features of construction, the combination of elements and the arrangement of parts which will be exemplified in the construction hereinafter described and the scope of the application of which will be indicated in the appended claims.

The preferred embodiment of the present invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a top plan view showing the device applied.

Fig. 2 is a longitudinal sectional detail view of the operating member.

Fig. 3 is an enlarged fragmentary top plan view showing the parts in a set position.

Fig. 4 is a similar view showing the position of the parts when released.

Fig. 5 is a perspective detail showing the relative position of the retainer, guide and hook on the valve arm at the time the stove is becoming overheated, and

Fig. 6 is a perspective detail of the catch, retainer and guide.

Fig. 7 is a side elevational view of the structure of Fig. 3.

Similar characters of reference are employed in all of the above described views to indicate corresponding parts.

Referring now, more particularly, to the accompanying drawings there is provided a supporting bar 1 to one end of which is connected a clamp generally indicated by the numeral 2 for engagement with a section 3 of the inlet gas supply pipe 4, the bar 1, of course, being supported in any convenient manner relative to the stove. A valve generally indicated by the numeral 5 is interposed between the section 3 and the adjacent section of the inlet pipe 4 and consists of a

casing 6 in which is turnably mounted a two-way valve body 7. A finger piece 8 projects from the valve body and facilitates turning thereof. An arm 9 extends from the valve body 7 and has a portion 10 projecting upwardly while the outer portion 11 extends horizontally from the vertical portion and terminates in a depending hook 12, for a purpose that will presently appear. A collar 13 is adjustably mounted on the outer section of the inlet pipe 4 by means of a set screw 14 while connected to the set screw 14 is one end of a coil contractile spring 15 the opposite end of which is connected to a supplemental arm which projects laterally from the portion 10 of the arm 9 and lies in a plane at right angles to the vertical plane of the horizontal portion 11 and serves as a means for normally holding the valve body closed and for automatically returning the valve body to a closed position subsequent to its release in a manner that will hereinafter become apparent.

The opposite end of the support 1 is curved and projects at right angles as indicated by the numeral 17 to the main portion the free terminal thereof being reduced as at 18 while pivotally connected thereto by means of a fastener 19 is a reduced end 20 of a lever 21. The combined catch, retainer and guide element generally indicated by the numeral 22 is now employed and consists of a plate-like body 23 which is formed with a transverse slot 24 while engaged through the slot and anchored in the outer portion of the lever 21 is the shank 25 of a screw 26 the head 27 of which serves as a means for clamping the plate-like body in various positions of lateral adjustment on the outer portion of the lever. The plate-like body is formed on its upper surface and near one side edge with a catch 28 behind which is adapted to be arranged the hooked end 12 of the arm 9 while also formed directly opposite the catch on the upper surface of the plate-like body is a retainer 29 the engaging face of which is positioned slightly forwardly of the catch while the catch on its outer face is cut away to provide a groove 30 between the catch and the retainer which allows for the passage of the hook 12 therethrough in a manner that will hereinafter become apparent, a bifurcated guide 31 is adjustably connected to the upper surface of the plate-like body 23 by means of a suitable fastener such as a screw 32 the shank of which is anchored in the body 23 subsequent to being passed through the bifurcation and this guide is formed with an inclined edge 33 which is disposed in a plane at right angles to the plane of the engaging face of the catch and also immediately adjacent and at right angles to the engaging face of the retainer for a purpose that will hereinafter become apparent.

In order to assure of the proper movement of the lever and the release of the valve arm to permit the spring to automatically close the valve and shut off the flow of gas through the pipe 4, improved expansion and contraction means is employed.

In the present instance this expander and contracter, indicated in its entirety by the numeral 34, consists of a tube 35 preferably of any metal that expands more than iron when heated, the inner end of which is bifurcated to form arms 36 which is straddled about the lever and the bar and secured to the bar by suitable fasteners 37 in such a manner as to also serve as a guide for the lever 21. Arranged within the tube is a rod 38 formed desirably of iron being secured at its outer end near the outer end of the sleeve by means of screws 39 and having its opposite end secured by a suitable fastener 40 to the lever. In this connection it is to be observed that the expander and contracter is desirably positioned in the body of the stove while the brass tube 35 by expanding more than the iron rod 38 draws the iron rod near its outer end. Inasmuch as the iron rod is connected to the tube near its outer end and by means of the rigid connection between the inner end of the rod and the lever 21 the latter is also drawn toward the rod or inwardly when the expander and contracter is subjected to heat; incidentally the lever will move in an opposite direction when the heat action on the expander and contracter decreases.

The mode of the operation of the present invention may be reviewed as follows:

Assuming that the parts have been assembled in the manner described and as illustrated in the drawings, especially in Fig. 1, the hook 12 of the valve arm is positioned behind the catch 28 while the expander and contracter is arranged within the stove near the burners. The parts remain in this set position until the heat causes the brass tube 35 to expand and as it expands more than the iron rod 38 the latter will be moved toward the outer end of the tube since it is connected to the tube by the fastener 39. This action draws the lever 21 and consequently the element 22 toward the valve and, therefore, as the catch moves the hook 12 will be released and the valve arm will swing owing to the tension of the spring 15 until it strikes the retainer 29. As long as the flame or heat acts on the expander and contracter at the original temperature the parts will remain in this position but should the flame be accidentally blown out or should the gas pressure become dangerously low the tube 35 and the rod 38 will contract and allow the lever 21 to move in the opposite direction and release the hook 12 of the valve arm 9 from the retainer which allows the spring 15 to

act and automatically swing the hook through the groove 30 and the valve body into a closed position thus cutting off the flow of gas and preventing the possible asphyxiation of persons. Now in the event that the gas is not extinguished and the stove becomes overheated a continued expansion of the tube 35 and the rod 38 will, of course, cause the lever to move closer to the valve. Now, assuming that the hook 12 is against the retainer during this latter movement, the hook will ride up the inclined edge 33 of the guide which is permitted owing to the resiliency of the valve arm 9 until the hook lies upon the upper surface of the guide 31 and as this guide is flush with the upper face of the retainer the spring 15 will act to swing the valve arm and consequently the valve into a closed position to shut off the flow of gas.

It is believed in view of the foregoing description that a further detailed description of the operation of the invention is entirely unnecessary. Likewise it is believed that the advantages of the invention will be readily apparent. However, it is to be appreciated that by the provision of a device of the above mentioned character the same will automatically turn off the gas in the event of any of the following conditions: (1) draft extinguished flame; (2) low pressure; (3) the cutting off of the gas supply by a gas company and the subsequent turning on of the gas; (4) accidental extinguishing of the pilot light; (5) an overheated stove. In other words the device is intended to abolish every possible danger encountered by the use of gas, including explosion, asphyxiation and fire in the house from an overheated stove.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limited sense. It is also to be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having thus fully described the invention what is claimed and desired to be secured by Letters Patent is:

1. In a device of the character described, a support, valve means for controlling the flow of gas, a lever pivotally connected to the support, a combination catch, retaining and guide element mounted on the lever, an arm projecting from the valve means and engageable with the catch, retaining and guide element, an expander and contracter connected to the support and also operably connected with the lever so as to control the position of the lever, and means for automatically returning the valve means to a closed position subsequent to the release of the arm from the catch, retaining and guide element upon the contracting or excessive expanding action of the expander and contracter.

2. In a device of the character described, a support, a gas supply pipe connected thereto, a valve casing interposed in the supply pipe, a valve body turnably mounted in the casing for controlling the flow of gas therethrough, a lever pivotally connected to the support, a combined catch, retaining and guide element adjustable laterally on the outer end of the lever, a hook like arm projecting from the valve body and engageable with the catch, retaining and guide element so as to assure of the releasable retention of the valve in an open position, an expander and contracter connected to the support and also operably connected to the lever, and means for automatically returning the valve means to a closed position subsequent to the release of the valve arm upon the contracting or excessive expanding action of the expander and contracter.

3. In a device of the character described, a support, a gas supply pipe, a valve casing interposed in the supply pipe, a valve body turnably mounted in the casing for controlling the flow of gas through the pipe, a lever pivotally mounted in the support, a combined element adjustably mounted on the outer end of the lever and designed to form a catch, a retainer and a guide, a hook like arm projecting from the valve body and normally engageable with the catch so as to assure of the releasable retention of the valve in an open position, an expander and contracter subject to the action of heat and cold connected to the support and operably connected to the lever for moving the lever upon expansion to release the hook like arm from the catch so that it will be engaged by the retainer, and means for automatically returning the valve means to a closed position subsequent to the release of the arm of the retainer upon the contracting action of the expander and contracter or subsequent to the engagement of the hook like arm with the guide upon the excessive expanding action of the expander and contracter.

4. In a device of the character described, a support, a gas supply pipe positioned in the support, a valve casing interposed in the supply pipe, a valve body turnably mounted in the casing for controlling the flow of gas through the pipe, a hook like valve arm projecting from the body, a lever pivotally connected to the support, a combined element adjustable laterally on the outer end

of the lever and designed to form a retainer and a catch against which the hook like arm is engageable to normally assure of the retention of the valve in an open position and an adjustable guide, coöperative means on the support and lever for facilitating the supporting of the outer end of the lever during movement thereof, an expander and contracter connected to the support and operably connected to the lever and expansible under the action of the heat to release the hook like arm from the catch so that it will be engaged by the retainer, and resilient means connected to the valve body and tensioned to automatically return the valve body to a closed position subsequent to the release of the hook like arm of the retainer upon the contracting action of the expander and the contracter or subsequent to the engagement of the hook like arm with the guide upon the excessive expanding action of the expander and contracter.

5. In a device of the character described, a support, a lever pivotally mounted on the support, coöperative retainer means carried by the valve means and the lever for releasably retaining the valve means in an open position, an expander and contracter consisting of a metallic tube of quick expansible metal connected to the support, a rod of less expansible metal positioned within the tube and having its outer end connected to the outer end of the tube and its inner end connected to the lever, so that upon expanding and contracting action of the expander and contracter the lever will be shifted, and resilient means for automatically returning the valve means to a closed position subsequent to the release of the valve means upon the contracting action of the expander and contracter.

In testimony whereof I affix my signature.

ALEXANDER E. RUCHTY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."