H. NIEMANN.

AUTOMATIC GAS CUT-OFF.

APPLICATION FILED MAR. 26, 1908.

899,184. Patented Sept. 22, 1908.

Fig. 1.

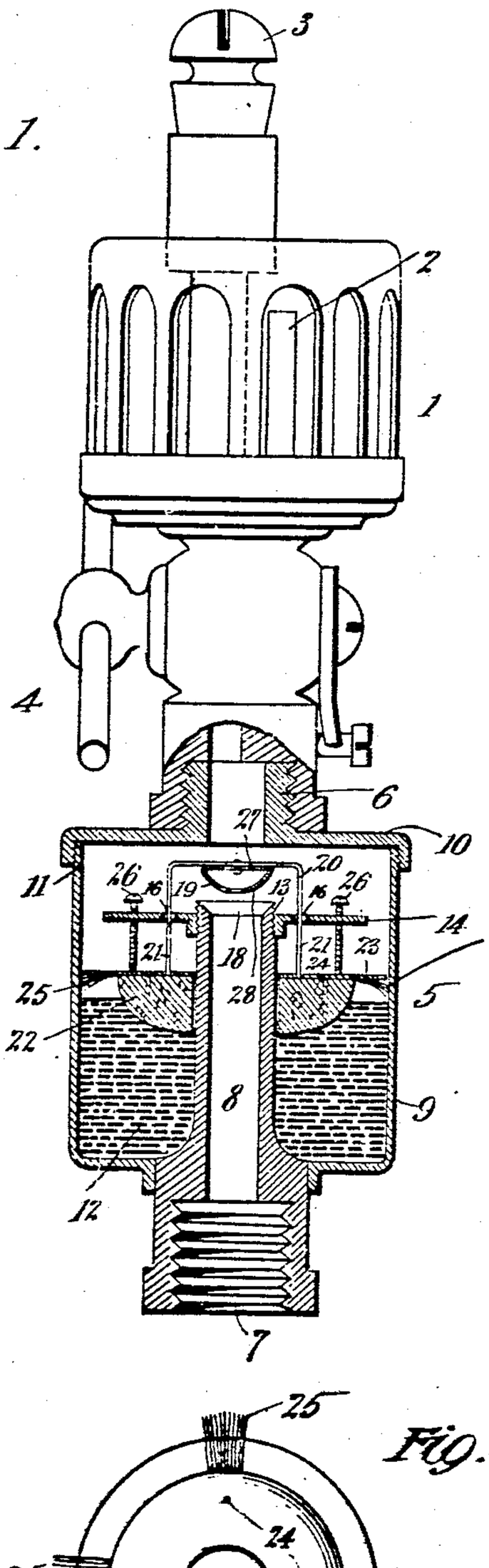


Fig. 2.

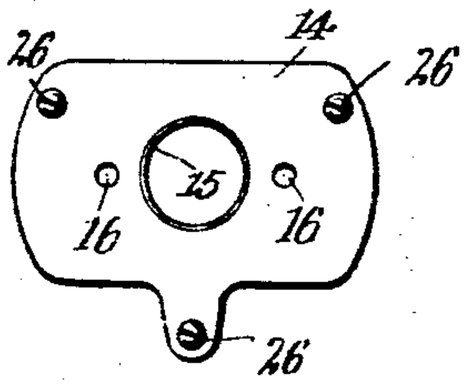


Fig. 3.

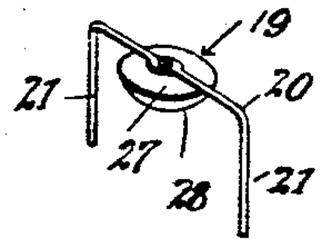
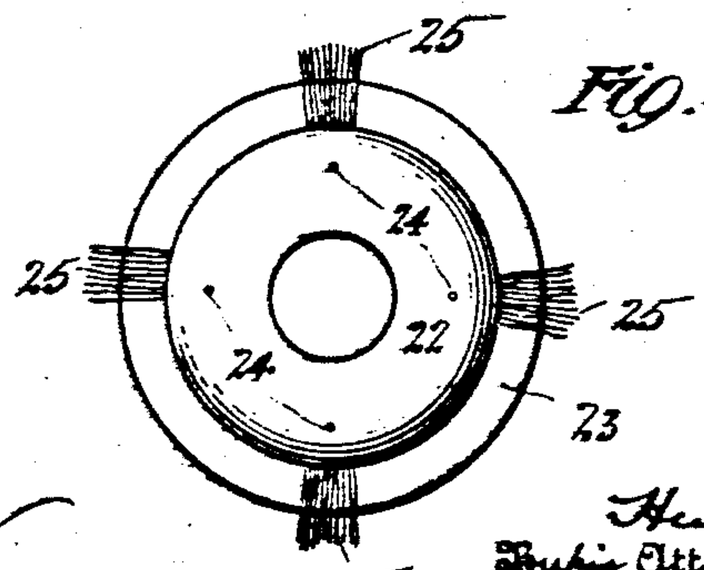


Fig. 4.



Witnesses:
Frank S. Ober
[illegible]

Inventor
Henry Niemann
By his Attorneys
Raymond Hawkridge

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY NIEMANN, OF NEW YORK, N. Y.

AUTOMATIC GAS CUT-OFF.

No. 899,184. Specification of Letters Patent. Patented Sept. 22, 1908.

Application filed March 26, 1908. Serial No. 423,332.

To all whom it may concern:

Be it known that I, HENRY NIEMANN, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Automatic Gas Cut-Offs, of which the following is a full, clear, and exact description.

My invention relates to a gas fixture appliance or attachment, the purpose of which is to automatically cut off the flow of gas from a burner of the type which has a constantly burning pilot light, in case the flame of such pilot light is accidentally blown out or extinguished. It is evident that unless the gas is cut off under these circumstances, it will continue to flow and escape, and constitute a very serious menace to life and property. This danger has been so great as to considerably limit the field of use of automatic gas lighters of the type having a constantly burning flame.

In carrying out my invention, I make use of a principle which I believe to be absolutely novel in this class of apparatus, and which depends upon the contraction of certain easily fusible substances at the point or temperature where such substances congeal or solidify. Bees wax, paraffin and sulfur may be mentioned as examples of substances of this class, and which I shall term broadly as congealing contractile substances. The essential characteristics of the substance used are that it becomes melted or fluid at a comparatively low temperature, say, between 30° or 40° C. and 200° C., with a considerable expansion in volume, and congeals with a corresponding contraction in volume when cooled. I make use of this substance in an apparatus having special characteristics and forming part of my present invention, as hereinafter described.

The invention consists in the features of construction and combination as particularly pointed out in the appended claims, reference being made to the accompanying drawings and description in which a preferred embodiment of the invention is set forth.

In the drawings, Figure 1 is a side elevation, partly in vertical section, of an automatic gas cut-off device embodying the principles of my invention. Fig. 2 is a detail plan view of one of the parts. Fig. 3 is a perspective view showing another part. Fig. 4 is a bottom plan view of the float.

1 indicates broadly an automatic gas lighting device of ordinary type having a pilot burner 2, through which gas is designed to continuously flow without interruption, and which is always lighted so as to furnish an ignition means for the main flame at the burner 3, which is controlled by the usual cock 4.

5 designates the device or appliance constituting my present invention, which has a threaded nipple 6 and threaded socket 7 of the standard character adapted for interchangeable use with all gas fixtures. The device 5 includes a main tubular portion 8 on which is supported a cup or casing 9 having a cover 10, of which the nipple 6 forms a part. The construction may be of any desired character, but I prefer the arrangement shown, in which the casing 9 is of circular or cylindrical outline, and having the cover 10 screw threaded thereto at its upper edge 11. Within the casing 9, there is contained the congealing contractile substance 12, which, as above stated, may be bees wax, paraffin, sulfur, or other material having similar or analogous characteristics. The outside surface of the tube 8 is made straight and cylindrical, and is screw threaded at its upper end 13.

14 designates a plate or frame with a central threaded hole 15 adapted to engage the threaded end 13 of the tube 8. This plate has a pair of holes or openings 16, which I have shown diametrically opposite to one another, and which serve to guide certain valve devices or parts. The upper end of the tube 8 has a valve seat 18.

19 designates a valve coöperating with the seat 18. This valve may be supported by a wire or similar frame 20 of inverted U-shape, having downwardly extending arms 21, which pass through the holes 16, already referred to.

22 designates a float supported by the congealing contractile substance 12, and movable vertically around the tube 8. In the practical construction shown, I make use of a thin circular plate 23, which is guided quite closely in the cavity of the casing 9, and to which the arms 21 are attached. The float 22 may be of cork or any other buoyant substance, and is attached to the plate 23 by pins 24, or other suitable fastenings.

25 designates brushes, which I make of asbestos fiber clamped and held between the plate 23 and the float 22, and which project radially outward at points around the float

to brush lightly against the walls of the containing cup or casing 9 so as to give a certain frictional impedance to its vertical movement and to prevent its lateral movement.

26 designates adjusting screws received in the frame or plate 14, and which project downward so as to limit the upward movement of the float. A sufficient quantity of the congealing contractile substance 12 is supplied to raise the float 22 and the valve 19 to their upward limits of movement determined by the screws 26, when the said substance is liquefied. In practice, I prefer to have the level of the substance 12 actually cover the float and slightly overlie the surface of the plate 23, so that the lifting and lowering action is made more positive. The exact point of the level may, however, be varied, and in the drawings, I have shown it as not entirely covering the float so that the showing of the various parts may not be obscured.

In use, the substance 12 is kept liquefied by the heat which is conducted downward from the continuously burning pilot burner 2. This burner, as stated, is designed to be constantly kept lighted, so that the entire apparatus remains in a state of warmth sufficient to maintain the substance 12 in a melted condition. When the substance 12 congeals, its very pronounced contraction causes the float to drop and the valve 19 is brought down upon the valve seat 18, so as to entirely cut off the flow of gas. It is to be noted that liquefying and congealing substances like those mentioned become pasty and viscous while cooling and contracting. This viscosity causes the float to be sucked or pulled down with a force which is considerably greater than its mere weight. Accordingly, the valve is forced against its seat 18 with a very considerable pressure which absolutely insures the cut-off of the gas. This action takes place, of course, whenever the apparatus cools off as a result of the pilot flame being blown out or otherwise extinguished.

The brushes 25 exert a function to prevent accidental closure of the valve against its seat by vibration or other extraneous influences, which otherwise might cause a slight movement of the parts with a corresponding fluctuation in the flow of gas. The frictional impedance produced by the brushes 25 is sufficient to overcome any such tendency. It is important, in practice, to make all of the movable parts very light in construction, and with this end in view, I make the valve 19 in the form of a hollow shell with an upper flat face 27, which is secured to the wire 20, and a lower rounded face 28 which engages the valve seat 18. In like manner, the wire frame 20 and the plate 23 are of as light and delicate a construction as is consistent with strength. In this way, the action of the device is extremely sensitive, and there is practically no liability of derangement from the vibration of the parts during transportation or shipment, or under any circumstances in use.

What I claim, is:—

1. In an automatic gas cut-off appliance adapted for use with a burner, a receptacle containing a congealing contractile substance normally maintained in molten condition by the heat from the burner, said substance melting at a temperature between 30° or 40° C. and 200° C., and a normally open valve closed by the contraction of such substance.

2. In combination with a burner having a constantly-ignited pilot flame, an automatic gas cut-off appliance having a congealing contractile substance, and means operated by the contraction of such substance for cutting off the gas from said burner.

3. In an automatic gas cut-off appliance, a receptacle containing a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., a float supported thereby, and a valve connected to said float and operating to cut off the flow of gas when said substance contracts.

4. In combination with a valve, a receptacle containing a congealing contractile substance melting at a temperature between 30° or 40° C., and 200° C., a float supported on said substance, and a connection from said float to said valve.

5. In combination with a valve, stops for limiting the opening movement of the valve, a receptacle containing a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., means displaced by the contraction thereof, and a connection between said means and said valve.

6. In combination with a valve, a receptacle containing a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., means displaced by the contraction thereof, a connection between said means and said valve, and means for preventing the closure of said valve by vibration from extraneous influences.

7. In an automatic gas cut-off appliance, a cup or casing containing a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., a float supported thereby, a tube having a valve seat, and a valve coöperating with said seat and displaced by said float, said substance contracting when it solidifies to hold the valve closed.

8. In an automatic gas cut-off appliance, a cup or casing containing a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., a tube extending into said casing and having a valve seat, a hollow valve having an inverted U-shaped frame, and a float connected to said

frame and supported by said substance, said substance contracting when it solidifies to hold the valve closed.

9. In an automatic gas cut-off appliance, a cup or casing adapted to contain a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., a tube axially projecting therein, a float guided around said tube and having a longitudinal movement in the casing, and a valve closing over the end of said tube and connected to said float, said substance contracting when it solidifies to hold the valve closed.

10. In an automatic gas cut-off appliance, a cup or casing adapted to contain a congealing contractile substance melting at a temperature between 30° or 40° C. and 200° C., a tube axially projecting therein, a float guided around said tube and having a longitudinal movement in the casing, a valve closing over the end of said tube and connected to said float, and stops for limiting the movement of the valve off its seat, said substance contracting when it solidifies to hold the valve closed.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

HENRY NIEMANN.

Witnesses:
ALFRED W. PROCTOR,
WALDO M. CHAPIN.