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E. A. McDONOUGH.

AUTOMATIC GAS CUT-OFF.

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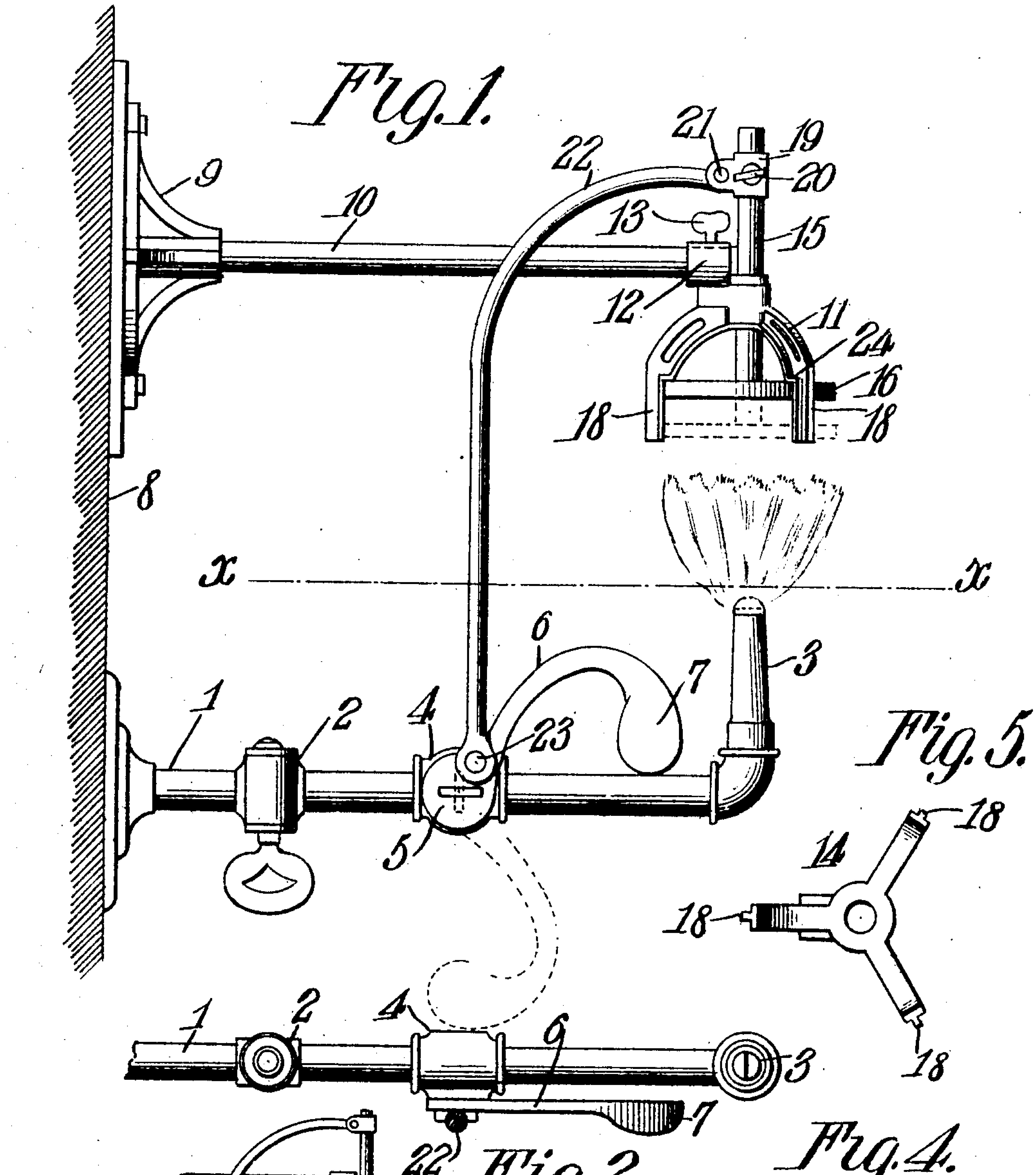

Witnesses

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UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS CUT-OFF.

No. 869,589. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed August 23, 1907. Serial No. 389,900.

To all whom it may concern:

Be it known that I, EDWARD A. McDONOUGH, a citizen of the United States, residing at Phœnixville, in the county of Chester and State of Pennsylvania, have invented a new and useful Automatic Gas Cut-Off, of which the following is a specification.

This invention has reference to improvements in automatic gas cut-offs designed more particularly for the stopping of the flow of gas to a burner should the flame be accidentally extinguished and the main supply valve still remain open.

The invention comprises a thermal element which by the heat of the burning gas is caused to be clamped firmly in a fixed support so as to hold the gas valve in open position but which element, when the gas is extinguished and the heat is no longer generated thereby will on cooling contract to such an extent as to free itself from clamping engagement with the fixed support, thus releasing a gravity valve to close the gas conduit and so stopping the flow of gas. The automatically closing valve is distinct from the main gas valve, so that the gas may be purposely extinguished.

The invention will be fully understood from the following detailed description, taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a side elevation of the improved gas cut-off as applied to a wall gas bracket of the single or straight-arm type; Fig. 2 is a cross section on the line *x*—*x* of Fig. 1, looking down upon the gas bracket; Fig. 3 is a view showing the manner of adapting the invention to a two-arm bracket and also to a Welsbach burner; Fig. 4 is a cross section through the thermal element; and Fig. 5 is an inverted plan view of a frame for carrying the thermal element.

Referring to the drawings, there is shown in Figs. 1 and 2 a gas bracket 1, which may be of the ordinary straight or rigid arm type, and in this gas bracket there is provided a valve 2 of the ordinary type adapted to control the flow of gas to the burner 3. Between the valve 2 and the burner 3 is another valve 4 which may be similar to the valve 2 but is placed at right angles thereto; that is, the axis of the valve is located in a horizontal plane. Fast to the valve stem is a plate 5 having formed on one side an arm 6 terminating in a weighted end 7, the weight on the end 7 being sufficient to cause the arm 6, when unrestrained, to assume a pendent position, indicated in dotted lines in Fig. 1, in which position the flow of gas through the valve 4 is cut off.

Fast upon a suitable support, such, for instance, as the wall 8 from which projects the bracket 1, is another bracket 9 carrying a horizontally projecting rod 10 to the outer end of which there is secured a tripod frame 11 by means of an eye 12 cast thereon and receiving the end of the rod 10. The eye 12 may be provided with a thumb-screw 13 by means of which the location of the frame 11 with relation to the burner 3 may be fixed, since the center of the frame 11 should be immediately over the center of the burner 3.

The frame 11 is provided with a central vertical perforation 14 through which extends a stem 15 carrying at its lower end a plate 16, the shape of which may be that shown in section in Fig. 4, that is, the plate 16 is a disk with an area 17 of reduced thickness between the periphery and the center, or the plate may be otherwise shaped, as desired. The plate 16 is made to fit freely between but with its periphery quite close to downwardly extending arms 18 formed on the ends of the tripod frame 11, and the inner faces of these arms are slightly farther apart at their lower ends than at their upper ends.

Above the frame 11 the stem 15 is encircled by a clamp or sleeve 19, held in place by a thumb-screw 20, and pivotally secured at 21 to this sleeve 19 is the upper end of a link 22, the lower end of which is pivotally secured, as shown at 23, to the plate 5 carrying the weighted arm 6 and fast on the stem of the valve 4.

The plate 16 is so constructed that when heat is applied it will expand diametrically to a limited extent, but its degree of expansion is so regulated that when subjected to heat it will expand sufficiently to firmly engage the inside faces of the arms 18 when lifted to the upper ends of these arms against shoulders 24 formed at the point of junction between the arms 18 and the tripod frame 11.

Now, let it be supposed that it is desirable to light the gas at the burner 3. The valve 2 is first turned on, that is, turned to a position to permit the flow of gas toward the burner 3. However, the flow of gas is prevented by the valve 4 which, because of the pendent position of the arm 6, is in the closed or turned-off position. The operator now moves the arm 6 to the position shown in full lines in Fig. 1, thus turning on the valve 4 and permitting the gas to flow to and escape from the burner 3. This movement of the arm 6, however, has lifted the link 22 and through the same and the stem 15 has elevated the plate 16 until it is in engagement with the shoulders 24 on the tripod frame 11. Now the gas flowing through the burner 3 is lighted and the heat generated thereby quickly causes the plate 16 to expand and engage the inner faces of the arms 18 and become firmly locked thereto. The parts will retain this position so long as the gas is burning. Now, let it be assumed that the flame at the burner 3 has become accidentally extinguished. The plate 16 being still hot remains locked in position and the valves 2 and 4 being both open, gas continues to flow through the burner 3. However, there being no heat generated by the flow of gas, the plate 16 quickly cools and contracting its periphery moves away from engagement with the arms 18, and since the inner faces

of these arms are slightly flaring toward their free ends, the plate is free to move downward and is urged in this movement by the weight 7 which comes into action as soon as the gripping action between the plate 16 and the arms 18 ceases. When the arm 6 falls the valve 4 is closed and the flow of gas is thereby stopped.

When the gas is designedly shut off by the proper manipulation of the valve 2 the plate 16 quickly cools and releases the weighted arm 6 and the valve 4 automatically closes, this time, however, without any escape of gas.

When it is desired to use a Welsbach burner the link 22 may be shaped as shown in Fig. 3.

When the device is attached to a two-arm bracket where one arm is hinged to the other, the rod 10 is replaced by an angle rod 25 which, in turn, is secured by a clip 26 to the swinging arm 27 of the bracket. Otherwise the structure is the same as shown in Fig. 1.

It will be understood that the plate 16 may be round, square or oblong in shape, or may be a simple flat plate, without affecting the operation of the device, but the shape shown in Fig. 4 is less liable to buckle or warp than a flat plate. Likewise, the frame 11 may have two or four or more legs instead of three as shown, and when a globe is used around the jet the legs will be made long enough to bring the plate 16 into the proper relation to the flame.

I claim:—

1. An automatic gas cut-off, comprising a gas valve constrained to normally assume the closed position, an expansion member connected to the valve and in the path of gas issuing from the burner and movable through a vertical path, and a fixed structure with which the expansion member engages and with which it automatically locks when expanded by heat, said fixed structure being in closer relation to the expansion member when remote from the burner than when at the other limit of its travel.

2. A gas fixture provided with a gas cut-off valve, another gas cut-off valve between the first-named valve and the burner and arranged with its axis of rotation in a horizontal plane, gravity means tending to maintain the horizontal valve in the closed position, an expansion plate in the path of gas issuing from the burner, connections between the expansion plate and the gravity-controlled gas valve, a fixed structure having a tapered portion in which the expansion plate is movable and with which it automatically locks when expanded by heat, and a support for said fixed structure for holding it above the gas burner.

3. An automatic gas cut-off comprising a gas valve constrained to normally assume the closed position, a plate constructed to expand when heated and located in the path of the gas so as to be heated by the same when lighted, connections between the plate and valve, a frame embracing the plate and along which the plate is movable, the said frame being arranged in closer relation to the plate at one limit of movement of the latter than at its other limit of movement.

4. In an automatic gas cut-off, a gravity valve, a plate connected to and movable with said valve and arranged in the path of gas escaping from the burner controlled by the valve, and a frame embracing said plate and in closer relation thereto when the valve is in the opened position than when the valve is in the closed position.

5. An automatic gas cut-off comprising a valve constrained to normally maintain the closed position, a plate connected to said valve and arranged in the path of escaping gas so as to be heated by the gas flame when the gas is lighted, and a frame having arms embracing the plate and having the faces contiguous to the plate gradually separating toward their free ends.

6. An automatic gas cut-off comprising a gas fixture having a gas cut-off valve and a burner, another gas cut-off valve between the first-named valve and the burner, a weighted arm connected to the stem of the second-named valve and tending to maintain said valve in the closed position, a frame arranged over the burner, a plate movable in said frame and constructed to engage and clamp with said frame when expanded by heat, and connections between the plate and the weighted arm on the second-named valve.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD A. McDONOUGH.

Witnesses:
JOS. H. RHOADES,
JOHN S. WEBER, Jr.