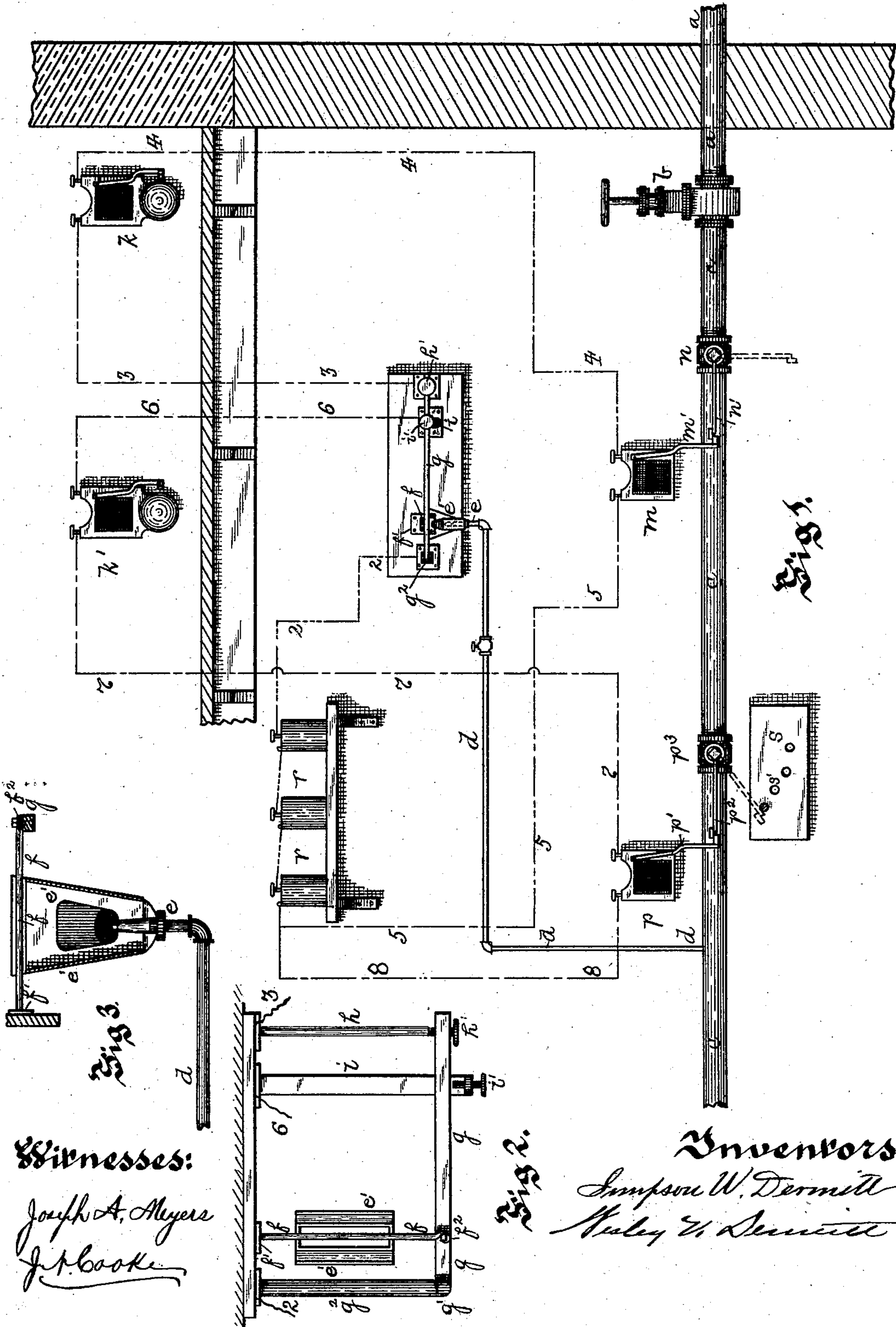


(No Model.)

S. W. & W. V. DERMITT.
ELECTRIC VALVE CONTROLLER.

No. 372,208.

Patented Oct. 25, 1887.



Witnesses:

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UNITED STATES PATENT OFFICE.

SIMPSON W. DERMITT AND WESLEY V. DERMITT, OF PITTSBURG, PENNSYLVANIA.

ELECTRIC VALVE-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 372,208, dated October 25, 1887.

Application filed December 11, 1886. Serial No. 221,258. (No model.)

To all whom it may concern:

Be it known that we, SIMPSON W. DERMITT and WESLEY V. DERMITT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Means for Detecting the Stoppage or Waste of Gas; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to means for detecting the stoppage and waste of gas and for operating the valves, so cutting off or reducing the supply in order to prevent accident.

It is well known that both with illuminating gas and fuel-gas—such as the natural gas, which is now employed largely for heating and manufacturing purposes—the pressure of the gas may vary, and in some cases the pressure may cease entirely, and that many accidents have occurred either from the decrease or stoppage of the gas, so that any fire or illuminating burner supplied thereby will go out, and when the pressure of the gas either comes on again or increases it leaks into the apartment, causing explosions; or that this pressure in many cases increases either on account of the decrease in the amount of gas drawn from the main or from accident in the regulating-valves employed, so that, where an ordinary fire is burning at a safe heat, on account of the increased pressure of the gas the heat may be increased to such an extent as to endanger the building in which the gas is burning by overheating the flue or igniting the wood-work near the burner, grate, or stove, several serious accidents arising from these causes having occurred with the use of natural gas.

The object of our invention is to provide means for detecting either the increased pressure or the decrease or stoppage of the flow of gas, and not only giving alarm, but at the same time, if desired, by the operation of suitable valves, in the case of stoppage of the flow, cutting off the supply entirely until it is turned on again by the occupant of the house, or, in case of increased pressure, so reducing the supply of gas to the house as to prevent accident from the same. To accomplish this we employ the well-known principle of expansion and contraction of a metal rod under different

temperatures, and cause this rod by expansion or contraction to operate one or more electric circuits, whereby, in case of the stoppage of the gas, the rod will contract and close the circuit, giving the alarm, and at the same time, if desired, operate a valve to cut off entirely the supply of gas to the grate or building, and in case of an increased pressure of the gas the increase in heat will cause a further expansion of the rod, thus closing the circuit, giving the alarm, and, if desired, at the same time operating a valve to reduce or cut off the supply of gas to the grate or building and prevent damage from the increased heat of the fire.

To enable others skilled in the art to employ our invention, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view illustrating our invention. Fig. 2 is a plan view showing the means of applying the heat to the rod and operating the circuits, and Fig. 3 is a detail view illustrating the apparatus.

Like letters of reference indicate like parts in each.

We prefer to arrange the apparatus so as to operate the valves in the main pipe leading into the cellar of the building, so as by one apparatus to protect the entire building from danger, though our improved apparatus may, if desired, be applied to any particular grate or burner.

In the accompanying drawings, *a* represents the main pipe leading into the building, and having a suitable stop-cock or gate-valve, *b*, for cutting off the supply, the supply-pipe *c* leading to the different grates or burners throughout the building. At any suitable point in this pipe, either in the cellar or in the upper part of the building, I carry off the branch pipe *d*, this pipe having a suitable burner, *e*, which has, preferably, the chimney *e'*, of any suitable form, to protect it from wind-currents, so that it will burn steadily; and above this burner I arrange the flame-rod *f*, this rod being formed of brass, iron, or any other suitable material which will expand and contract according to the heat of the flame, or in case the flame is cut off entirely. The rod

5 *f* is secured firmly at one end, as at *f'*, and at the other end is secured the armature *g*, as at *f''*, this armature being pivoted, as at *g'*, to a suitable post, *g''*, and having at one end the
 10 thumb screw *h'*, which is arranged to come in contact with the cut-off rod *h*, and at another point being arranged to come in contact with the heavy-pressure rod *i*, a suitable thumb-screw, *i'*, being arranged so as to adjust the
 15 contact, and the thumb-screw *i'* being either on the heavy-pressure rod *i* or on the armature *g*, the heat from the burner *e* acting to expand the flame-rod *f*, and in case of too heavy pressure causing the armature *g* to come in contact with the heavy-pressure rod *i*, and in case
 20 the supply of the gas is cut off entirely or the flame is reduced to any great extent the rod *f* contracting and making contact between the thumb screw *h'* and the cut-off rod *h*. This apparatus is arranged in connection with certain electric currents, as hereinafter described, so that in case of contact of the armature *g* either with the cut-off rod *h* or heavy-pressure rod *i* an alarm will be sounded through the
 25 electric bell *k* or *k'*, and in case of contact between the armature and cut-off rod *h*, through a suitable magnet, *m*, and its armature *m'*, the handle *n'* of the cut-off valve *n* in the supply-pipe *c* will be dropped, so cutting off all
 30 supply to the pipe *c*, and in case of contact between the armature *g* and heavy-pressure rod *i*, through a suitable magnet, *p*, and its armature *p'*, the handle *p''* of the reducing-valve *p''* will be dropped, and so through said valve
 35 reduce or cut off the pressure within the supply-pipe and prevent any danger of fire on account of the increased pressure in the pipe. The electric currents for accomplishing this result are arranged in the following manner:
 40 The battery *r* is arranged at any suitable point in the building, and is connected by the wire 2 with the armature-post *g''*, the wire 3 extending from the cut-off post *h* to the electric bell *k*, the wire 4 leading thence to the magnet *m*, and the wire 5 leading from the magnet to the battery *r*. The wire 6 leads from the high-pressure post *i* to the electric bell *k'*, the wire 7 leading thence to the magnet *p*, and the wire 8 extending thence to the battery *r*. In case
 50 of contact between the armature *g* and the cut-off rod *h*, the current will pass from the battery *r* by the circuit 2, *g*, *h*, 3, *k*, 4, *m*, and 5, thus ringing the electric bell *k*, giving the alarm, and through the magnet *m* attracting the
 55 armature *m'* thereof and dropping the handle *n'* of the cut-off valve *n*, and so cause the closing of that valve. The alarm will then continue to ring until the apparatus is readjusted, and either by the adjustment of the thumb-screw
 60 *h'* or by the expansion of the flame rod *f* the apparatus is brought to its normal position. In case, however, the pressure of the gas increases, the flame of the burner *e* will correspondingly increase, and by the increased heat
 65 will expand the flame-rod until it moves the armature *g* and makes contact with the heavy-

pressure rod *i*, when, through the circuit *r*, 2, *g*, *i*, 6, *k'*, 7, *p*, and 8, it will sound the bell-alarm *k'*, and at the same time will, through the magnet *p*, attract the armature *p'*, thus
 70 dropping the handle *p''* of the reducing-valve *p''*, and so reducing the pressure of the gas in the supply-pipe or cutting off the same, and prevent accident from the increased pressure of the gas. The reducing-valve *p''* can be regulated to cut off any desired amount of pressure, and for this purpose we generally employ the adjusting-plate *s*, located below the reducing-valve *p''*, this plate having several pin-holes, *s'*, therein, and a pin being placed in
 80 any of these holes, and so acting, by supporting the handle *p''* of the valve, to permit it to fall only the desired distance in cutting off whatever pressure is requisite. The handles *n'* and *p''* of the cut-off and reducing valves are
 85 weighted, so as to properly operate the valves.

The construction of the apparatus may be varied, as is well known to those skilled in the art, the essential features being that the circuit or circuits desired can be operated by the
 90 expansion or contraction of the flame-rod, so as to give necessary alarm or operate the valve or valves, or both, as may be desired.

By the term "flame-rod" employed in this specification and the claims it is intended to
 95 include any metallic or other substance of any suitable form subjected to the heat from the gas-flame and adapted by its expansion or contraction to operate an electric circuit. The electric circuit employed may operate either
 100 by opening or closing to detect the stoppage or the waste of the gas.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of a gas supply pipe
 105 having a valve therein provided with a weighted operating-arm, a catch for holding said arm up, and an electro-magnet for withdrawing said catch, with a burner connected to said supply-pipe, and a thermostat subjected to the
 110 heat from said burner, and in an electric circuit with said electro-magnet, substantially as and for the purpose set forth.

2. The combination of a gas-supply pipe
 115 having a valve therein provided with a weighted operating-arm, a catch for holding said arm up, and an electro-magnet for withdrawing said catch, with a burner connected to said supply-pipe, a thermostat subjected to the heat from said burner, and in an electric circuit
 120 with said electro-magnet, and an electric alarm-bell in said circuit, substantially as and for the purpose set forth.

In testimony whereof we, the said SIMPSON W. DERMITT and WESLEY V. DERMITT, have
 125 hereunto set our hands.

SIMPSON W. DERMITT.
 WESLEY V. DERMITT.

Witnesses:

JOSEPH A. MEYERS,
 J. N. COOKE.