

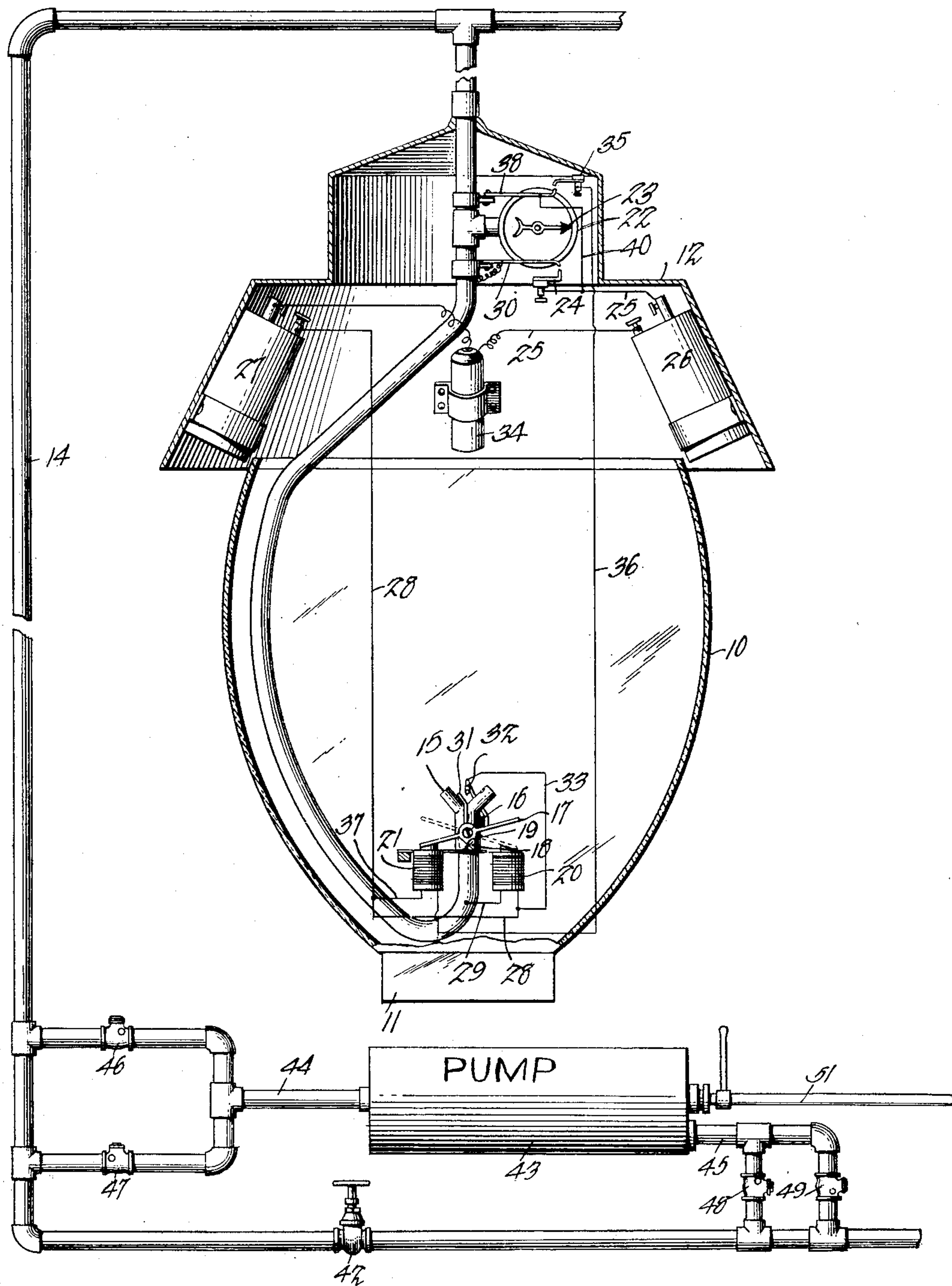
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B. W. HARRIS.
AUTOMATIC GAS LIGHTING APPARATUS.

APPLICATION FILED NOV. 6, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 742,024, dated October 20, 1903.

Application filed November 6, 1902. Serial No. 130,316. (No model.)

To all whom it may concern:

Be it known that I, BARNETT W. HARRIS, a citizen of the United States, residing at Waveland, in the county of Montgomery and State of Indiana, have invented a new and useful Automatic Gas-Lighting Apparatus, of which the following is a specification.

The invention relates to improvements in devices of that class employed for automatically lighting gas-jets and for cutting off the flow of gas to the burner, and has for its principal object to provide an automatic mechanism whereby street-lamps or other lights having piping connections with a central source of supply may be simultaneously ignited and extinguished by increasing or decreasing the pressure of the central station.

A further object of the invention is to provide a mechanism of simple and economical construction for increasing or decreasing the pressure of gas in the supply-pipes.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawing, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

The accompanying drawing is a view, partly in the nature of a diagram, illustrating a street-lamp provided with an automatic igniting and extinguishing mechanism arranged in accordance with my invention and showing the arrangement of the devices employed at the central station for varying the pressure of the gas.

The lamp shown in the accompanying drawing is in the nature of a street-lamp; but it will be understood that this is merely to illustrate one embodiment of the invention, the mechanism for igniting and extinguishing the light being applicable to any form of burner connected to a gas-supply, and it may be employed in connection with single burners or with a large number of burners, as where the street-lamps of a city or town are to be simultaneously ignited or extinguished

or the lights of a building or factory turned on or off at a given time.

In the drawing, 10 designates a globe supported on a suitable base 11, and at the top of the globe is a hood or cap 12, preferably formed of metal and serving as a protector for the globe and as a support for the batteries, spark-coil, and circuit-closing devices of the igniting and extinguishing mechanism. Gas is supplied from a central station to a pipe 14, leading to the lower portion of the globe 10 and provided with a burner 15 of any desired character, that illustrated in the drawing being a form of burner commonly employed in the consumption of acetylene gas. The pipe is provided with a valve of the usual type, having a stem 16 projecting outside the valve-casing and secured to a double armature 17. The armature is in the form of a two-armed lever, formed of soft iron and having a central depending tongue 18, against which bears a plate-spring 19, the spring serving by engagement with said tongue to maintain the armature-lever in either position to which it is adjusted and, further, to assist in the movement of said lever after an initial movement has moved the same in either direction beyond a horizontal plane. Under the armature are two electromagnets 20 and 21, which may be connected to a suitable source of electrical energy, the magnet 20 when energized attracting the armature-lever and moving the same to a position such as indicated by dotted lines in Fig. 1 to open the valve and allow the gas to pass to the burner, while the electromagnet 21 serves to attract the armature and move the same to the position shown in full lines in Fig. 1, the valve being closed and the supply of gas cut off. In either movement of the armature the action of the magnet is assisted by the pressure of the spring on the tongue 18 after the armature has been moved slightly past a horizontal position, and the spring, furthermore, locks the armature in either of its two positions, so that the current may be cut off immediately after the armature has been moved.

In the present instance the supply-pipe 14 is illustrated as extending downward through the hood 12, and connected to said pipe is an ordinary form of pressure-gage 22, having a

revoluble arrow or pointer 23, which is moved in one direction or the other as the pressure of gas in the supply-pipe is increased or diminished. Immediately below the pressure-gage is a fixed contact-plate 24, connected by a conductor 25 to a cell 26, which is connected in series with a cell 27, and from the latter extends a conductor 28 to the electromagnet 20. The magnet-winding is connected by a wire 29 to the pipe 14, and to the pipe is secured a spring contact-finger 30, arranged immediately above the contact-plate 24 and in the path of movement of the pointer 23, so that when the pressure of gas in the supply-pipe is increased the pointer will make contact with the finger 30 and force the latter into engagement with the contact-plate 24, completing a circuit through the electromagnet 20 and energizing said magnet to effect a movement of the armature-lever to the position illustrated in dotted lines and opening the valve in the gas-pipe 14.

In order to ignite the gas issuing from the burner, there is provided a flexible electrode 31, secured to the central portion of the armature 17 and electrically connected with the gas-supply pipe 14, and secured to, but insulated from, the burner is a second electrode 32, connected to the conductor 28 by a wire 33, so that after the energized electromagnet 20 has started the movement of the armature-lever 17 to move the valve to the open position and the lever has passed the horizontal line the electrode 31 will come into contact with the electrode 32 and short-circuit the current, cutting out the electromagnet 20. The spring 19 then acts to complete the movement of the armature-lever and by suddenly separating the two electrodes creates a spark sufficient to ignite the gas issuing from the burner, and for this purpose a sparking coil 34 is placed in the circuit at any desired point.

Above the pressure-gage is a contact-plate 35, from which extends a conductor 36, connected to the electromagnet 21, and the winding of the magnet is connected by a line-wire 37 to the battery-wire 28. Below the contact-plate 35 is a spring contact-finger 38, which may be supported by the pipe 14, but insulated from said pipe, this finger being electrically connected by a conductor 40 to the battery-wire 25. When pressure is reduced in the gas-pipe, the pointer 23 comes into contact with the finger 38 and forces the same into engagement with the contact-plate 35, thus completing a circuit which may be traced from battery 26 through conductor 25, spark-coil 34, battery 27, conductor 28, conductor 37, electromagnet 21, conductor 36, contact-plate 35, contact-finger 38, conductor 40, and conductor 25 to battery, thus energizing the electromagnet 21 and restoring the valve to its closed position.

At a convenient point, as at a central station, is a pressure-varying mechanism comprising in the present instance a suitable

pump 43, connected by pipes 44 and 45 to the gas-pipe 14, the connections being made, respectively, on opposite sides of a valve 42, disposed in the pipe 14 and by which the supply of gas to the lamps may be cut off when necessary. The pipe 44 has two connections with the pipe 14, and in each connection is a check-valve, the valve 46 opening outward from the pump, while the valve 47 opens in the opposite direction to permit the passage of gas from the pipe 14 to the pump. The pipe 45 has also a double connection with the pipe 14, suitable valves 48 and 49 being disposed in the connections and opening, respectively, in opposite directions. The pump contains a piston operated from any suitable source of power, a piston-rod 51 being employed to connect the piston to its operating mechanism. When the piston is reciprocated, the pressure in the supply-pipe may be either increased or diminished and results in the movement of the pointer in one or other direction to close the circuit through the electromagnet 20 and open the valve and ignite the gas or close the circuit through the electromagnet 21 to close the valve and extinguish the gas.

Having thus described my invention, what I claim is—

1. The combination with a gas-burner, of a valved supply-pipe, means for varying the pressure of gas in the supply-pipe, a movable member connected to the pipe and responsive to variations of pressure therein, electromagnetically-operated mechanism for moving the valve to closed or open position and for igniting the gas, a source of electrical energy connected to the magnets, and circuit-closing devices adapted to be actuated by said movable member.

2. The combination with a gas-burner, of a valved supply-pipe, sparking electrodes for igniting the gas, an armature connected to the valve and carrying one of said electrodes, a pair of electromagnets adapted to attract the armature, the energizing of one magnet effecting a closing movement of the valve and of the opposite magnet an opening movement of said valve, a source of electrical energy connected to said magnets, means for varying the pressure of gas in the supply-pipe, a movable member responsive to variations of pressure, and circuit-closing devices arranged within the path of movement of said movable member for closing a circuit through one or other of the electromagnets.

3. The combination with a gas-burner, of a supply-pipe, a valve, a two-armed armature-lever, a pair of electromagnets adapted respectively to effect a movement of the armature-lever in opposite directions, an angular tongue carried by the armature-lever, a spring bearing on said tongue to assist in the movement of the armature-lever and to lock the same in either position, a sparking electrode carried by the armature-lever, a sta-

tionary electrode disposed adjacent to the burner, a source of electrical energy with which said electromagnets are independently connected, a shunt extending around one of the magnets and connected to the stationary electrode to establish a sparking circuit, and a pressure-operated mechanism for closing the circuit through one or other of the magnets.

4. The combination with a gas-burner, of a supply-pipe, a valve in said pipe, a two-armed armature-lever connected to the valve, an angular tongue carried by the armature-lever, a spring engaging said tongue to assist in the movement of the armature-lever and to lock the same in either position, a movable sparking electrode carried by the lever, a stationary electrode disposed adjacent to the burner and in the path of movement of the movable electrode, a pair of electromagnets adapted to attract the armature-lever to move said lever in opposite directions, electric circuits including a source of electrical energy connected to the magnets and to the sparking electrodes, a movable member having a connection with the gas-supply pipe and responsive to variations of pressure therein, and a pair of circuit-closing fingers forming the terminals of the electric circuits and disposed in the path of movement of said movable member.

5. In a device of the class specified, a gas-lamp comprising a burner, electromagnetically-operated mechanism for controlling the supply of gas to the burner and for igniting the same, an inclosing globe, means for supporting the same, a metallic hood disposed over the globe, cells supported within the hood, a spark-coil also carried by said hood, a pressure-gage having a revoluble member disposed within the hood and connected to the supply-pipe, and circuit-closers also disposed within the hood and arranged at points in the path of movement of the revoluble member, the circuit-closers being connected in circuits including the electromagnetically-operated mechanism and the sparking coil, substantially as specified.

6. In a device of the class specified, a gas-supply pipe, a burner, an electromagnetically-operated mechanism for controlling the flow of gas to the burner and for igniting the gas, a pressure-actuated circuit-closer connected with the pipe, and a governing-valve for shutting off the flow of gas.

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

BARNETT W. HARRIS.

Witnesses:

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G. A. BUSHERT.