(No Model.)

L. H. McCULLOUGH.

GAS REGULATOR.

No. 260,039. Patented June 27, 1882.

Fig. 1.

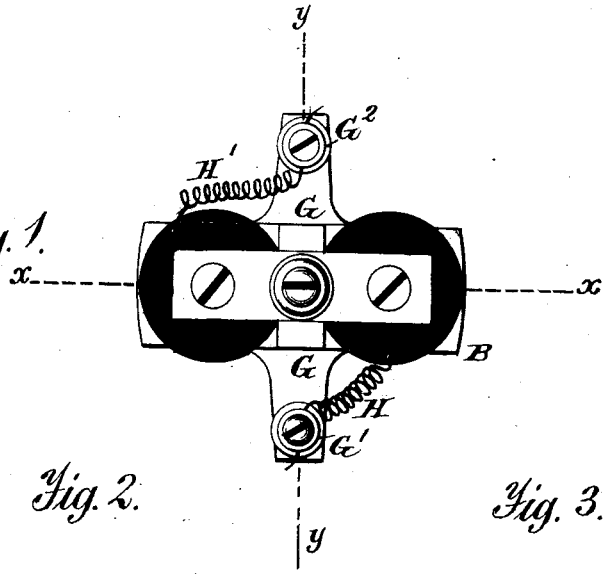


Fig. 2.

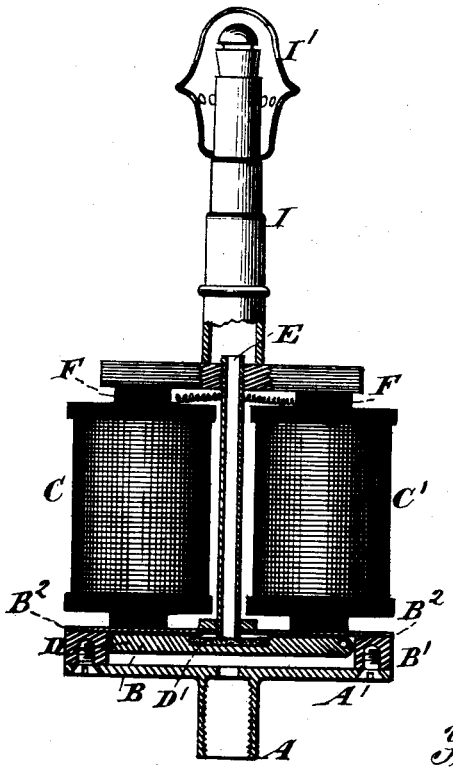


Fig. 3.

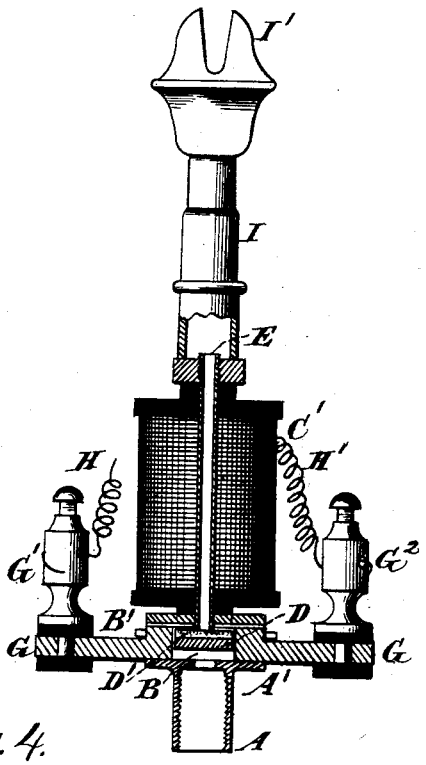
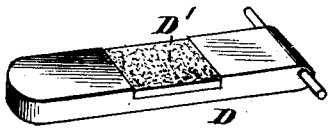


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

LEWIS H. McCULLOUGH, OF RICHMOND, INDIANA.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 260,039, dated June 27, 1882.

Application filed May 1, 1882. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. McCULLOUGH, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Gas-Regulators, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to magneto-electrical gas-regulators for controlling the flow of gas to gas-burners placed in street or other lamps and suitably connected to a battery, in order that the flow of gas to a single burner, or to a series of burners at one point, or to a series of burners placed in a particular district or upon a single circuit, may be regulated, it being designed as an improvement upon the device for which an application for Letters Patent was filed by me in the United States Patent Office on the 31st day of December, 1881; and the objects of my present improvements are, first, to provide such a construction and combination of devices as to enable me to dispense with the case and its contained insulating material shown in said pending application; second, to provide a method of preventing the armature from adhering or sticking to the core of the magnet; third, to provide an armature so constructed and arranged that it shall be moved into its proper position for shutting the gas from the burner by the magnet, and in the opposite direction so as to allow the full amount of gas to flow to the burner by its own gravity; fourth, to provide such devices and combinations thereof as will produce the results herein described. I attain these objects by the devices and combinations thereof illustrated in the accompanying drawings, in which—

Figure 1 is a plan or top view, showing the gas-burner, the bar to which it is attached, the magnets, the binding-posts, the connecting-wires, and the gas-chamber. Fig. 2 is a vertical section on line *x x* of Fig. 1, showing the gas-induction passage, the gas-chamber, and the armature located therein, a valve forming a part of said armature, a thin sheet of brass or other non-magnetizable metal, and pipes for conducting the gas from the chamber to the burner, the magnets, the connecting-wires, and the burner. Fig. 3 is a sectional elevation on line *y y* of Fig. 1; and Fig. 4 is a perspective view of the armature, showing its pivotal point and the location thereon of the gas-controlling valve.

Similar letters refer to similar parts throughout the several views.

In constructing regulators of this type it is important that they should be as light as possible, and that they should be reduced to the smallest practicable dimensions, in order that they may be readily and safely attached to the pipe leading thereto. With this object in view I provide a socket, A, which has a screw-thread upon its inner surface for attaching the regulator to the induction-pipe, said socket being formed upon or attached to a plate of metal, A′, which forms the under side of the gas-chamber B, the side walls of which are composed of a frame, B′, of brass or other suitable metal, it being of such length as to adapt it for the reception and support of a thin sheet of brass or other non-magnetizable metal, B^2, upon which the lower ends of the cores of magnets C and C′ rest, said thin sheet being the upper surface of the gas-chamber B, within which there is pivoted an armature, D, the pivotal point of which is at or near one of its ends, in such a manner that when drawn upward the valve D′ upon its upper surface may rest upon the lower end of the pipe E, which conducts the gas from chamber B to the burner, and thus close or nearly close the end of said pipe, at which time the upper surface of the armature will be in contact with the thin plate B^2, in which position it will be held by the magnetism which passes through said plate from the cores of the magnets so long as the current of electricity is maintained through the wires leading to the battery; but when such current is broken or ceases to pass the gravity of the armature will cause its free end to fall down sufficiently far to remove the valve from the end of the pipe, which will allow gas to flow to the burner, the armature being prevented from falling too low by any suitable stop provided for that purpose, or by coming in contact with the lower plate of the gas-chamber.

In order that a small flame may be constantly maintained at the burner, the material of which the valve D′ is made is, by preference, of some porous substance—such as buckskin or other soft leather—which will allow gas enough to

pass it for that purpose; but said valve may be made of some soft metal, and have in it a small crease or groove for the passage of the required amount of gas, it being desirable to have only so much pass as will serve to ignite the larger quantity when it is turned on by the opening of the valve.

The magnets C C′ are of the usual or any approved form, and have central cores, F, made of soft iron, the lower ends of which, as above stated, rest upon the thin plate B^2.

Upon the sides of the frame D there are formed projecting ears G G, in which are secured the binding-posts G′ G^2, to which the circuit-wires are attached, the current from the battery entering at G′ and passing through a wire, H, to one of the spools or helices of the magnet, and from that to the other, as shown in Fig. 2, and out through the wire H′ to post G^2, and from thence through a wire attached thereto, through which it passes to another burner, and so on to other burners that are placed in the line or circuit.

The gas-burner I is provided with a hood, I′, which may be of the form usually employed on coal-oil lamps, or of any other that will prevent the small flame from being extinguished by the wind. The armature is shown as being provided at its pivoted end with a rod which projects therefrom upon both of its edges, the intention being to have said projecting ends pass through the side bars of the frame D; but as it is important that the armature shall be so suspended as to allow it to be moved with the least possible amount of friction I prefer to suspend it upon screws or pins passing through said frame, having pointed ends, which shall enter corresponding cavities formed in the sides thereof.

For convenience in removing the burner from its lower plate, it is attached thereto by screws, as shown in Fig. 2, so that, should the armature or its valve need adjustment at any time, it can be done without unscrewing the bottom plate from the pipe. For the purpose of protecting the wires of the magnet from the effects of the elements, I prefer to first dip them in wax, paraffine, or other similar non-conducting substance, and afterward cover them with hard rubber.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A gas-chamber constituting a portion of a gas-regulator, the upper wall or plate of which consists of a thin sheet of brass or other non-magnetizable metal, through which the magnetism passes from the magnet or magnets and operates to raise or attract an armature placed in said chamber, substantially as set forth.

2. In a gas-regulator the valve of which is operated partially by electro-magnetism and partially by gravity, the combination of a gas-chamber the upper wall or plate of which is of thin brass or other non-magnetizable metal, an armature which, when the circuit is closed, rests upon the under surface of said thin plate, and a magnet or magnets the core of which rests upon its upper surface, substantially as and for the purpose set forth.

3. The combination of the gas-chamber B, one of the walls of which is of thin brass or other non-magnetizable metal, the armature D, valve D′, secured upon and moved by said armature, the gas-conducting pipe passing up between the magnets and through the heel-piece, and the burner I, the parts being arranged substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS H. McCULLOUGH.

Witnesses:
D. P. HOLLOWAY,
A. RUPPERT.