A. GIORGI.

MEANS FOR CONTROLLING THE SUPPLY OF GAS TO GAS BURNERS AND FOR IGNITING THE SAME.

APPLICATION FILED JAN. 21, 1910.

994,670. Patented June 6, 1911.

Fig. 1.

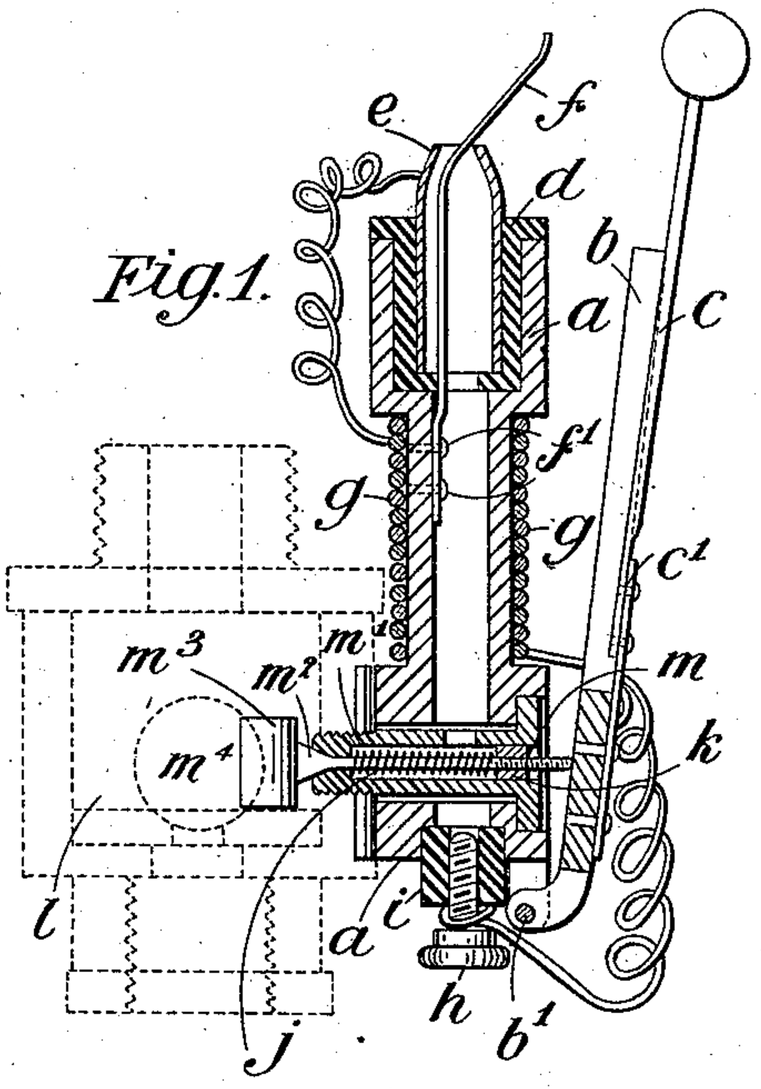


Fig. 3.

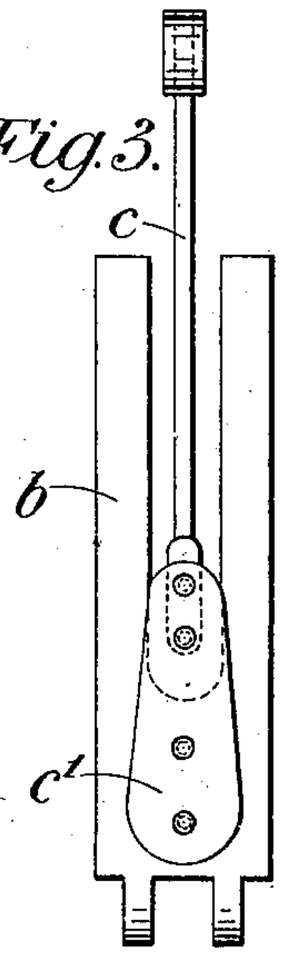


Fig. 2.

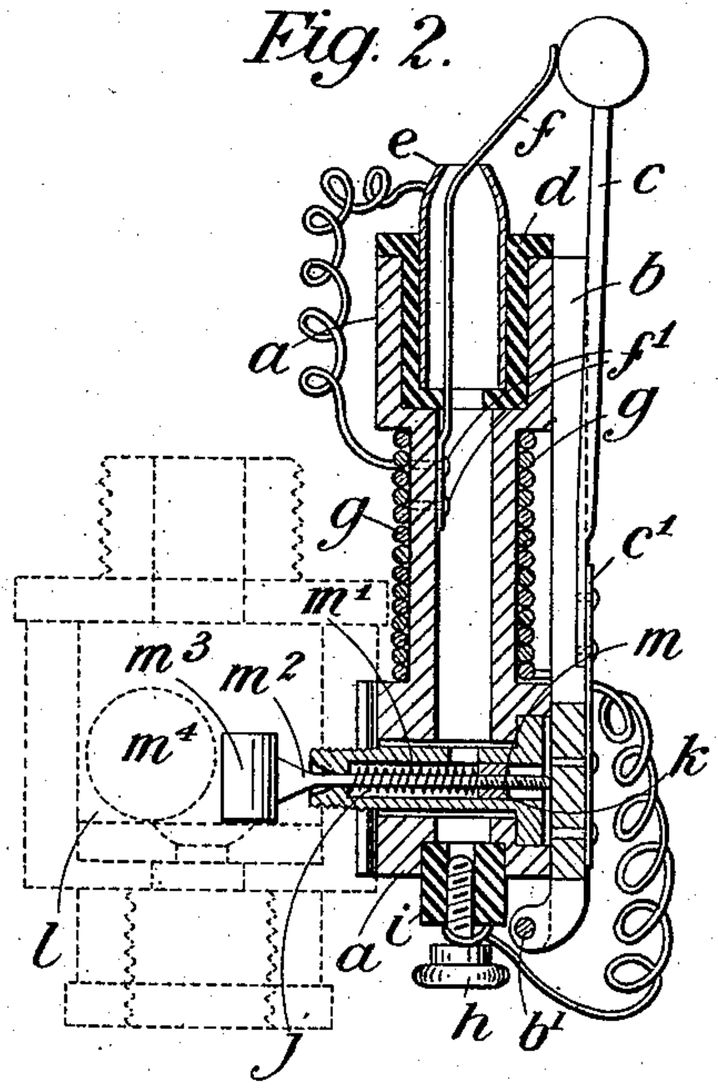


Fig 4

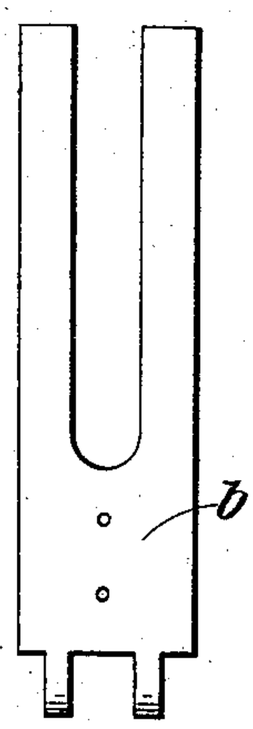
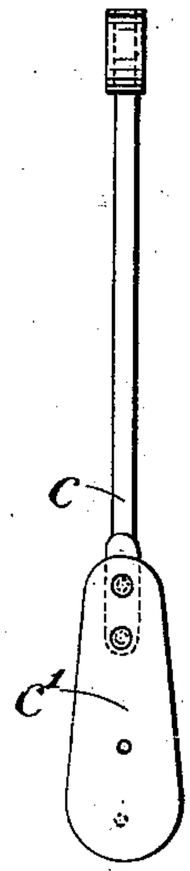


Fig. 5.



Witnesses

C. D. Kesler

Inventor

Amedeo Giorgi

By James L. Norris.

Atty

UNITED STATES PATENT OFFICE.

AMEDEO GIORGI, OF FLORENCE, ITALY.

MEANS FOR CONTROLLING THE SUPPLY OF GAS TO GAS-BURNERS AND FOR IGNITING THE SAME.

994,670. Specification of Letters Patent. Patented June 6, 1911.

Application filed January 21, 1910. Serial No. 539,347.

To all whom it may concern:

Be it known that I, AMEDEO GIORGI, a subject of the King of Italy, residing at Florence, in the Kingdom of Italy, have invented new and useful Means for Controlling the Supply of Gas to Gas-Burners and for Igniting the Same, of which the following is a specification.

My invention relates to electrically operated means for controlling the supply of gas to gas-burners, and also for igniting the same.

According to my invention, my improved device comprises an electro-magnet which is provided with a hollow core and with a double armature, the said armature being advantageously pivoted, or hinged, to the lower end of the electro-magnet, and being preferably composed of one part in the form of a fork, between the legs of which the second part, which is in the form of an elastically mounted hammer, is located. The upper end of the hollow core has mounted in it, but electrically insulated therefrom, a socket, or nozzle, through which the gas for ignition purposes escapes, and which is electrically connected to one end of the winding around the hollow core, the other end of the said winding being connected to a clamp-screw mounted upon, but insulated from, the lower end of the magnet core. A wire or rod, of a non-oxidizable metal, extends through the socket, or nozzle, and is connected, at its lower end, to the inside of the hollow core, its upper end projecting through the open end of the socket, or nozzle, and normally resting in contact therewith. The hollow core is in communication with the casing of the valve controlling the supply of gas to the burner and to the by-pass socket, or nozzle, and the connecting passage is provided with means, such as a spring-rod, by means of which the valve is controlled in the manner hereinafter described.

The device operates as follows, that is to say: When the circuit, which includes the electro-magnet, is completed, the double armature is attracted, the forked part thereof actuating the afore-mentioned spring-rod, so as to open the valve and permit the gas to flow to the burner and through the by-pass passage in the magnet core and nozzle. At the same time, the other part of the double electro-magnet, that is to say the elastically mounted hammer, comes into contact with the spring-rod in the nozzle, presses the same back from contact with the edge of the latter, thus breaking the electric circuit, so that the said spring armature rebounds and again permits the spring-rod to make contact, whereby it is again attracted. In this manner, the elastically mounted hammer is vibrated, and causes a series of sparks to be formed between the spring-rod and the edge of the nozzle, thus igniting the gas which flows through the same, and thereby the gas which is supplied direct to the burner through the valve opened in the manner above described.

To enable the invention to be readily understood, I will describe it fully with reference to the accompanying drawings, in which:

Figure 1 is a sectional elevation of a device for controlling the supply of gas to gas burners and igniting the same, constructed according to my invention. Fig. 2 is a view similar to Fig. 1, but showing the parts in a different position. Fig. 3 is a face view of the double armature, and Figs. 4 and 5 are similar views, respectively, of the two parts thereof.

a represents the hollow core of the magnet, and *b*, *c*, the double armature thereof, *b* being the fork-shaped part pivoted to the lower end of the hollow magnet core *a* at b^1, while *c* represents the hammer-portion, which is mounted upon the spring c^1 secured to the lower end of the fork-shaped part *b*.

e is the socket, or nozzle, which is fitted at the upper end of the magnet core *a*, the said nozzle being insulated from the said core by means of the insulating sleeve *d*.

f is the spring-rod of a suitable non-oxidizable metal, the said rod extending through the nozzle *e*, and being secured at its lower end, as shown at f^1, to the inner surface of the core of the hollow magnet *a*, while its upper end, which projects beyond the upper end of the nozzle *e*, is normally in contact with the edge or lip of the latter, as clearly shown in Fig. 1.

g is the winding of the magnet, the upper end of the said winding being connected to the nozzle *e*, while the lower end is connected to the binding-screw *h*, which is screwed into the insulating block *i* fitted in the lower end of the hollow magnet core *a*.

The lower part of the hollow core *a* is

formed with a transverse passage *j*, which is fitted with a bush *k* in communication with the interior of the casing *l*, shown in broken lines in Figs. 1 and 2, of the valve which controls the supply of gas, to the service pipe of which it is fitted, the said bush *k* having mounted within it a rod *m* normally held in the inoperative position by means of the spring m^1, and projecting, at its outer end, through the magnet *a*, and into contact with the lower end of the part *b* of the armature. Or the spring may be dispensed with, and the valve rod *m* be loosely connected to the armature *b*, in which case directly the electric current is switched off the armature would be released from its contact *f*, and pull back the striker m^3 with it, so permitting the ball valve m^4 to return to its seat and close the gas supply.

The device operates as follows, that is to say: Assuming that the gas be cut off and that it be desired to ignite a burner, the electric circuit containing the electro-magnet is closed by a controlling switch (not shown) whereupon current flows from the battery, which is also not shown in the drawings, to the binding screw *h*, thence through the winding *g*, to the nozzle *e*, and through the spring-rod *f*, to the hollow core *a*, and thence to earth. The double armature *b*, *c*, is thereby attracted toward the electro-magnet, as shown in Fig. 2, this movement of the double armature actuating the spring controlled rod *m* (furnished with a valve m^2, and a striker m^3) so as to open the gas valve m^4, and cause the gas to pass through the same to the burner, and also through the hollow core *a* to the nozzle *e*. The part *c* of the magnet is attracted simultaneously with the part *b*, and its upper end strikes the end of the spring-rod *f*, thereby pushing the same out of contact with the nozzle *e*, and breaking the circuit, so that the elastic armature *c* recoils, thereby permitting the circuit to be again completed, this operation continuing as long as the controlling switch is on, thereby causing the armature *c* to vibrate and create a rapid succession of "makes" and "breaks" and consequently a succession of sparks between the spring-rod *f* and the nozzle *e*. This sparking ignites the gas issuing from the socket or nozzle *e*, and the ignited gas issuing from this by-pass serves to ignite the gas issuing from the main burner. It will be understood that the rapid "make" and "break" effected by the elastically mounted part *c* of the armature has no effect upon the part *b* of the armature which controls the supply of gas by reason of hysteresis; that is to say, the vibratory movement of the part *c* resulting in the "make" and "break", will not cause a corresponding movement of the part *b*, since the latter, by reason of its greater mass, is held momentarily against the magnet core after each "break" by the action of hysteresis, the "makes" and "breaks" occurring in extremely rapid succession on account of the fact that the part *c* is attached to the spring *c'* and hence is capable of vibration, and that said part coacts with the spring contact *f*, wherefore the part *b* will be held in retracted position during the entire time that the current is switched on, while the part *c* will be unaffected by hysteresis, owing to its relatively small mass and to its particular mounting above described.

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

1. A gas ignition device comprising an electro-magnet having a hollow core through which a current of gas is adapted to flow; a contact arranged at the discharge end of said core; and a swinging armature having a vibratory member adapted to strike said contact, when attracted, for setting up sparking, the vibration of said member being relative to said armature.

2. A gas ignition device comprising an electro-magnet having a hollow core through which a current of gas is adapted to flow; a nozzle fitted to the discharge end of, but insulated from, said core; a spring rod projecting through said nozzle, said rod having one end thereof secured to said core and the opposite end normally in contact with said nozzle; and an armature having a vibratory member adapted to strike the second-named end of said rod, when attracted, to set up sparking.

3. A gas ignition and controlling device comprising an electro-magnet having a hollow core through which a current of gas is adapted to flow; a contact arranged at the discharge end of said core; a gas controlling valve; a movable actuating member therefor; and a double armature having one part thereof adapted to move said actuating member and the other part adapted to strike said contact, to set up sparking.

4. A gas ignition and controlling device comprising an electro-magnet having a hollow core through which a current of gas is adapted to flow; a spring contact arranged at the discharge end of said core; a gas controlling valve; an actuating member therefor; and a double armature composed of a body portion adapted to operate said member, and a vibratory spring hammer secured to said body and adapted to strike against said contact, to set up sparking.

5. The combination, with a casing communicating with the burner and the gas supply, and having a controlling valve arranged therein; of an ignition and controlling device comprising an electro-magnet having a hollow core communicating with said casing to admit a current of gas to flow

from the latter thereinto, a movable spring-controlled actuating member for said valve mounted in said core, a contact connected to said core, and an armature adapted, when attracted, to move said member into position to actuate said valve, said armature including a member adapted to coöperate with said contact, to set up sparking.

6. A device for controlling the supply of gas to gas burners, and for igniting the same, comprising an electro-magnet having a hollow core, a nozzle, fitted to, but insulated from, the said core, a spring-rod passing through the said nozzle, one end of said rod being connected to said core, and the other end normally in contact with the said nozzle, a gas controlling valve, a member mounted in the said core for actuating said valve, and a double armature, one part of which is designed to operate the said actuating member, and the other said rod, substantially as and for the purpose hereinbefore described.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

AMEDEO GIORGI. [L. S.]

Witnesses:

JEROME A. QUAY,

JOSEPH CAIN.