No. 716,855. Patented Dec. 30, 1902.

H. BERGNER.

GAS IGNITER.

(Application filed Aug. 16, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2.

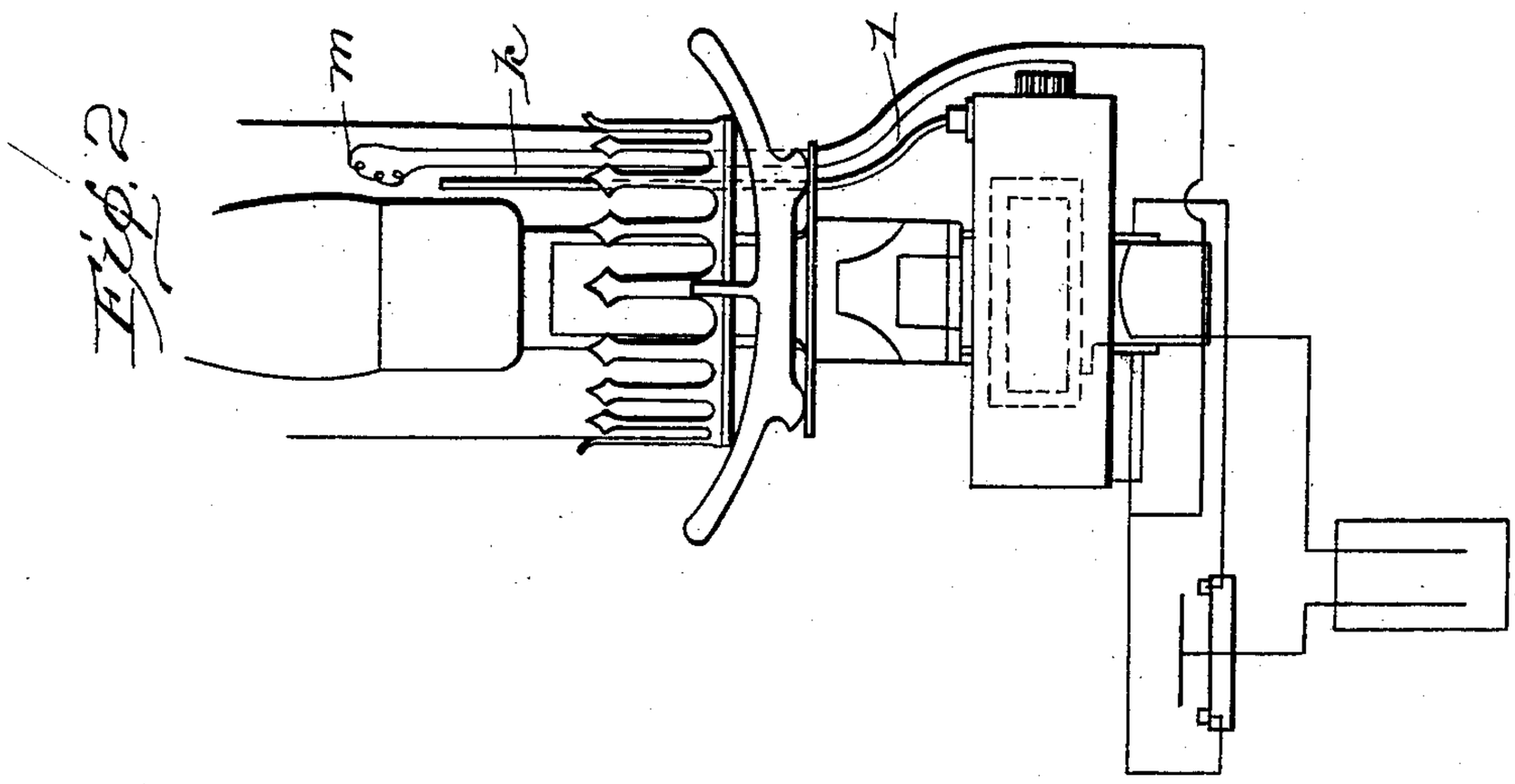
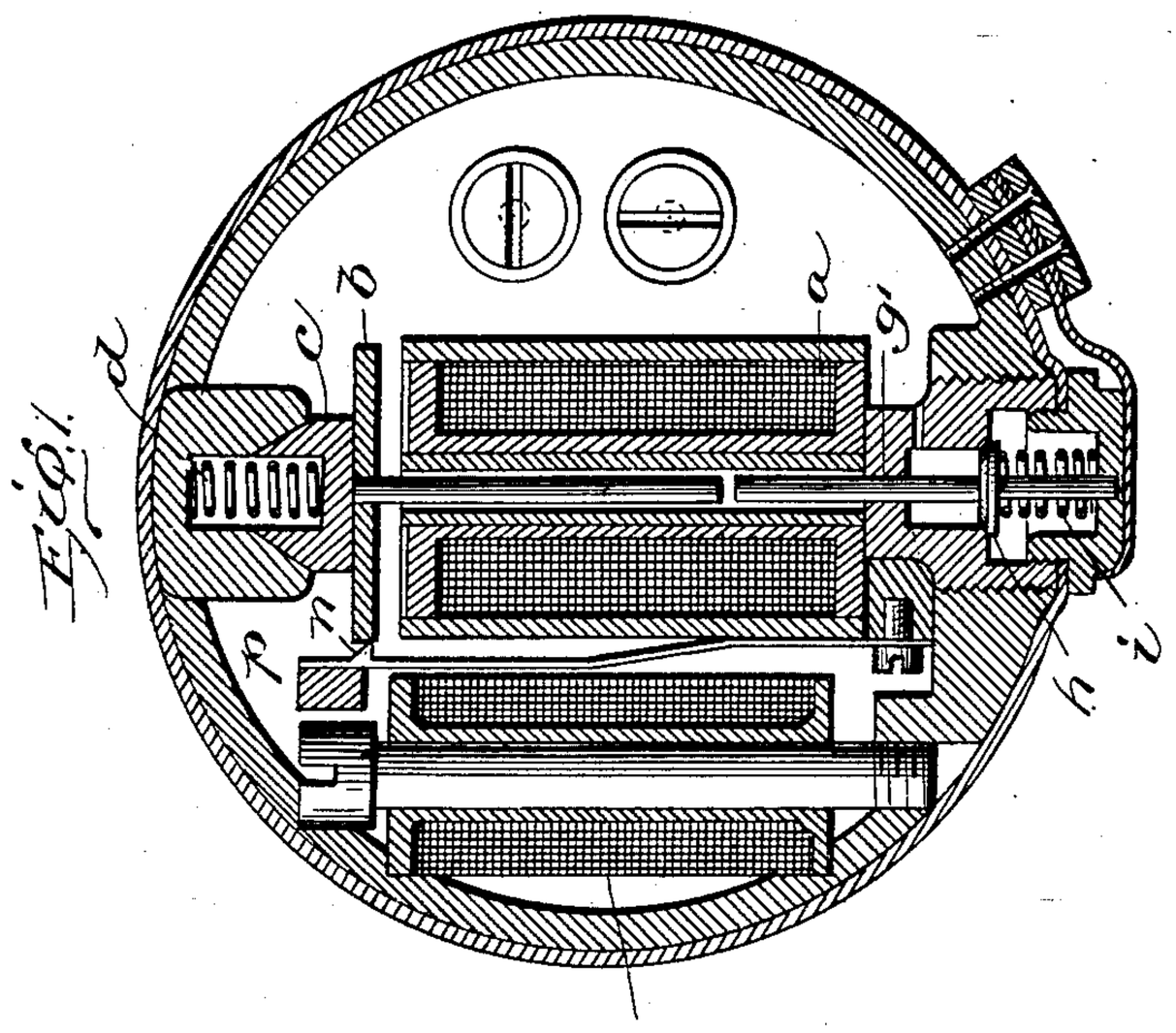


Fig. 1.



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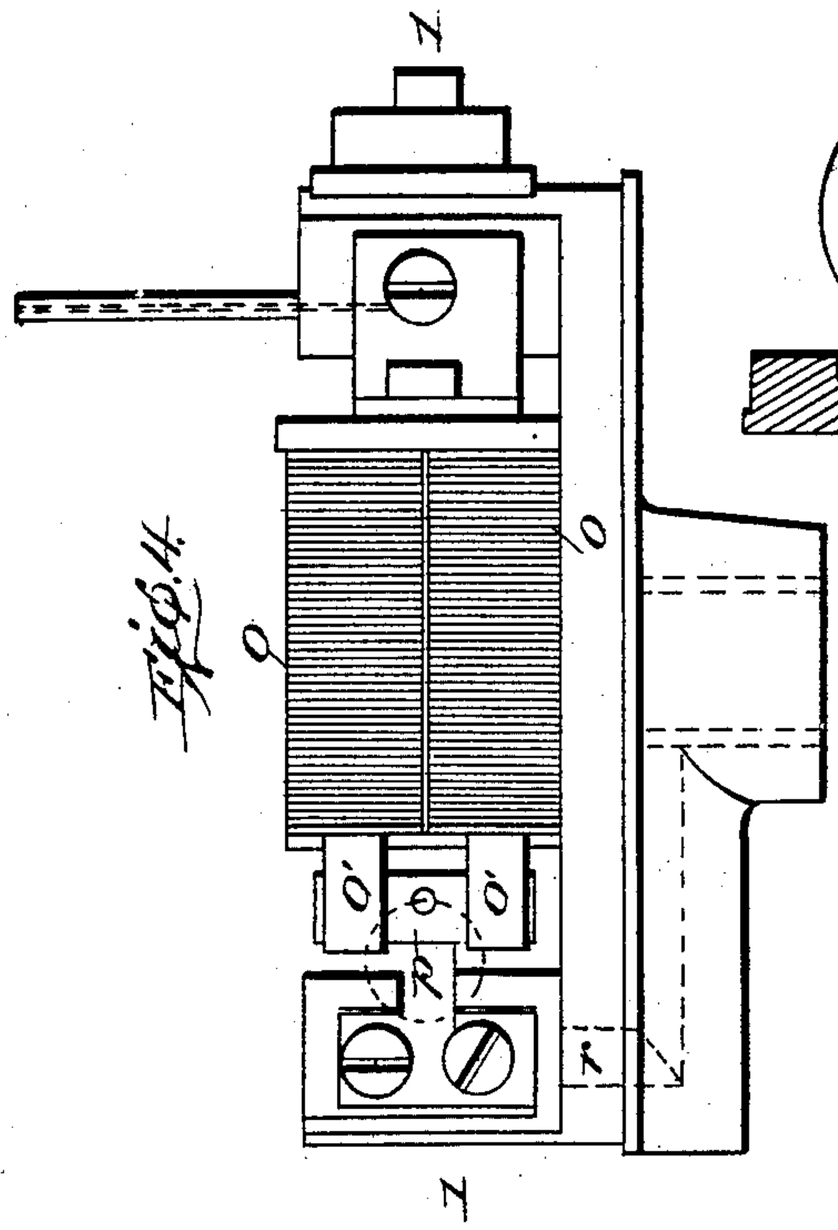

Fig. 4.

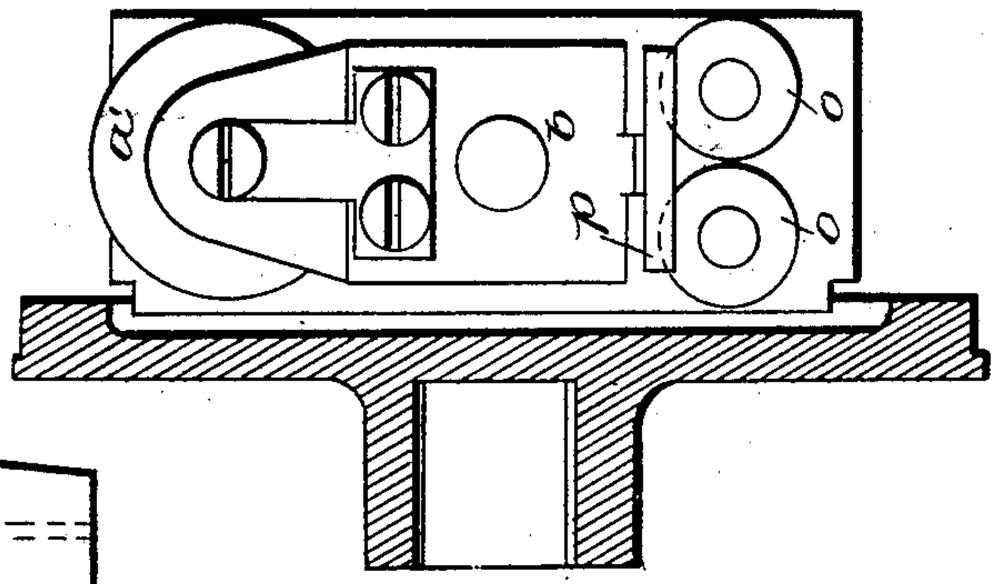

Fig. 5.

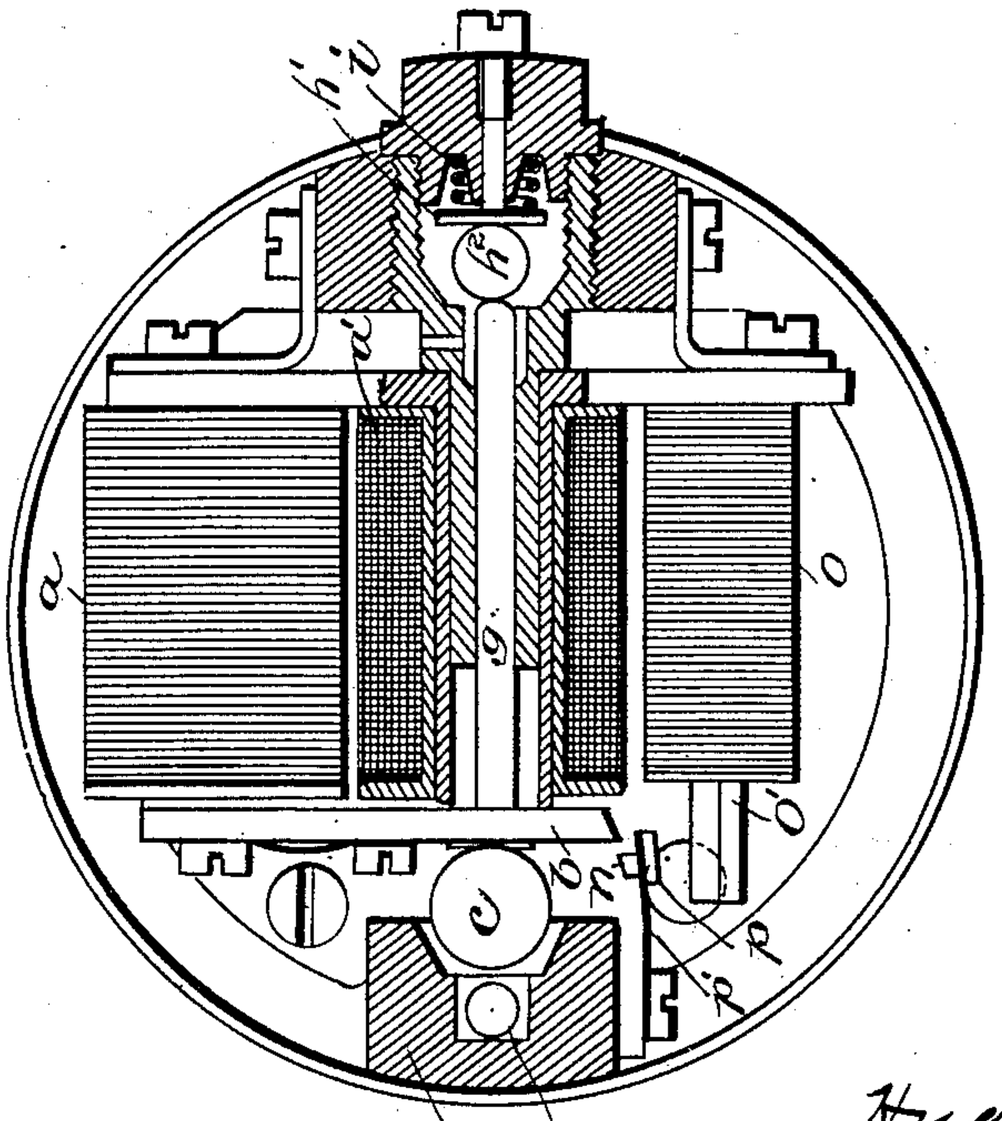

Fig. 3.

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UNITED STATES PATENT OFFICE.

HUGO BERGNER, OF FRANKFORT-ON-THE-MAIN, GERMANY.

GAS-IGNITER.

SPECIFICATION forming part of Letters Patent No. 716,855, dated December 30, 1902.

Application filed August 16, 1902. Serial No. 119,955. (No model.)

To all whom it may concern:

Be it known that I, HUGO BERGNER, a subject of the German Emperor, residing at Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Electric Igniters for Gas-Burners, of which the following is a specification.

This invention relates to an electric igniter for gas-burners which differs from those hitherto used by its simplicity, absolute reliability, and durability.

The said igniter essentially comprises two electromagnets, one of which is adapted to open a valve in the main conduit and then by means of the said valve to temporarily open the valve of the by-pass burner and put into circuit a platinum coil arranged above the said by-pass burner, the electromagnet being only temporarily excited, so that the main valve immediately returns, but is checked in its course by a spring-pressed pawl. The said valve will then have moved so far back that the auxiliary valve can return to its seat, and the circuit containing the platinum coil will be broken. The flame is extinguished by means of the other electromagnet, which is excited by means of a push, whereupon it attracts an armature connected to the pawl referred to and releases the main valve, which latter then yields to a spring and is completely closed. The apparatus is essentially characterized by the fact that the valves for the main and by-pass burners are coaxial to each other and that the spindle of the auxiliary valve is directly operated by that of the main valve and, further, that the auxiliary valve makes direct contact when lifted from its seat in order to heat the platinum coil by which the by-pass burner is ignited. All movable parts are so arranged as to be situated in a casing which is closed on all sides and has only those apertures necessary for the inlet and outlet of gas.

In the annexed drawings, Figure 1 is a section of the apparatus on an enlarged scale, and Fig. 2 is an elevation representing a complete burner provided with the igniting device. Fig. 3 is a section on the line 1 1 of Fig. 4, showing another form of construction. Fig. 4 is a side view from the left of Fig. 3 with the casing removed. Fig. 5 is a plan view of the armatures which operate the valves and the locking device.

The entire mechanism is contained in a cylindrical casing.

a is an electromagnet, in front of which is the disk-shaped armature *b*. The latter is provided with a guide-rod adapted to be moved in a passage extending through the entire length of the magnet-core, but considerably shorter than the said passage. To the armature is fixed the conical valve *c*, which is pressed or pulled against its seat by a spring *d*. This valve closes the gas-conduit to the main burner.

When by pressing a push the circuit of the electromagnet is closed and the latter is thus excited, the armature *b* is attracted and the valve leaves its seat and opens the gas-conduit to the main burner. During the return of the armature the guide-rod abuts against the spindle *g'*, which extends from the other side into the passage, and the valve *h* is by this means moved from its seat against the action of a spring *i*. The gas-conduit is thus opened to the by-pass burner *k*, Fig. 2, and at the same time the elastic contact *l* closes an electric circuit which contains a platinum coil *m*, arranged above said by-pass burner. The said coil thereupon becomes heated and is instantaneously brought to such a degree of heat by the catalytic action of the gas from the by-pass that the latter is ignited. Immediately this has been effected or after the push has been released the armature returns under the action of its spring, but is checked after a short distance by a pawl *n*, so that although the circuit is broken the valve in the main conduit remains open. The valve will then have moved so far back that its guide-rod is out of contact with the spindle *g'* of the by-pass valve *h*, and the latter thereupon returning to its seat under the action of its spring closes the conduit to the by-pass burner and at the same time puts the igniting-coil out of circuit. To extinguish the flame, another electromagnet *o* is excited by pressing another button, whereupon the said magnet attracts the armature *p*, connected with the pawl *n*. The armature *b* is thus released

and the valve fixed to it can yield to its spring and close the gas-conduit. In the drawings both valves are shown closed.

In the form of construction shown in Figs. 3 to 5 the rod g is not divided, but abuts at one end against the armature b and at the other end against the ball h^2, which opens and closes the auxiliary valve.

In the open position (shown in the drawings) the electromagnet a, assisted by the electromagnet a', has attracted the armature b, which forms an elastic flap. By this means the ball c of the ball-valve e, which was previously held against its seat by the armature b, is released, so that gas enters the chamber from the pipe shown in Fig. 4 and passes to the main burner. At the same time the armature b has pushed the rod g back and the latter has pushed from its seat the ball h^2 of the auxiliary ball-valve against the action of the spring i, which acts on plate h', provided with a guide-rod, so that gas can thus pass out of the chamber through the channels q, Fig. 3, and r, Fig. 4, to the by-pass burner. The movement of the ball h^2 and the plate h' causes the electric circuits containing the platinum coil to be closed, and the latter is thus heated and ignites the by-pass burner. When thereupon the circuit of the electromagnet a is broken, the armature yields to its spring d and moves, with the ball c, away from the electromagnet. The pawl n, however, checks the elastic armature p in its course, so that the main valve is not closed, and gas continues to flow to the main burner. During its backward movement, however, the armature releases the rod g, and the ball h^2 of the auxiliary valve is forced by the spring-pressed plate h' against its seat and closes the gas-conduit to the by-pass burner. At the same time the igniting platinum wire is put out of circuit.

To extinguish the main burner, the electromagnet o is excited by pressing another button, whereupon the said magnet attracts with its core o' the armature p against the action of the spring p', and the pawl n thereon moves back and releases the armature b, which latter then advances for its entire course, presses ball c into its seat, and interrupts the supply of gas to the main burner.

I declare that what I claim is—

1. In an electric gas-igniter the combination of a main gas-valve normally held closed, an armature adapted when attracted to open said valve, a by-pass gas-valve normally held closed, so placed in reference to the main gas-valve that the latter during the latter portion of its opening movement opens the by-pass valve and means for limiting the return movement of the main valve toward its closed position so as to suffer the by-pass valve to close without closure of the main valve.

2. In an electric gas-igniter the combination of a main gas-valve normally held closed, an armature adapted when attracted to open said valve, a by-pass gas-valve normally held closed, so placed in reference to the main gas-valve that the latter during the latter portion of its opening movement opens the by-pass valve, and means for limiting the return movement of the main valve toward its closed position so as to suffer the by-pass valve to close without closure of the main valve together with a circuit comprising an incandescible platinum in relation to the by-pass burner and contacts in said circuit operated upon the opening of the by-pass valve, for the ignition of the by-pass.

3. In an electric gas-igniter the combination in a casing of a main gas-valve and a by-pass gas-valve in the same axial line a hollow-cored electromagnet coaxial with said valves an armature operating directly the main valve, a stem on said armature traversing the hollow core and extending to such proximity to the by-pass valve that it will open the latter during the latter portion of its movement when attracted, a pawl for limiting the return movement of the armature for the purpose set forth and means for withdrawing said pawl.

4. In an electric gas-igniter the combination in a casing of a main gas-valve and a by-pass gas-valve in the same axial line, a hollow-cored electromagnet coaxial with said valves an armature operating directly the main valve, a stem on said armature traversing the hollow core and extending to such proximity to the by-pass valve that it will open the latter during the latter portion of its movement when attracted, a pawl for limiting the return movement of the armature for the purpose set forth and means for withdrawing said pawl together with a circuit comprising an incandescible platinum in relation to the by-pass burner and contacts in said circuit operated upon the opening of the by-pass valve for the ignition of the by-pass.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO BERGNER.

Witnesses:
FRANZ HASSLACHER,
MICHAEL VOLK.