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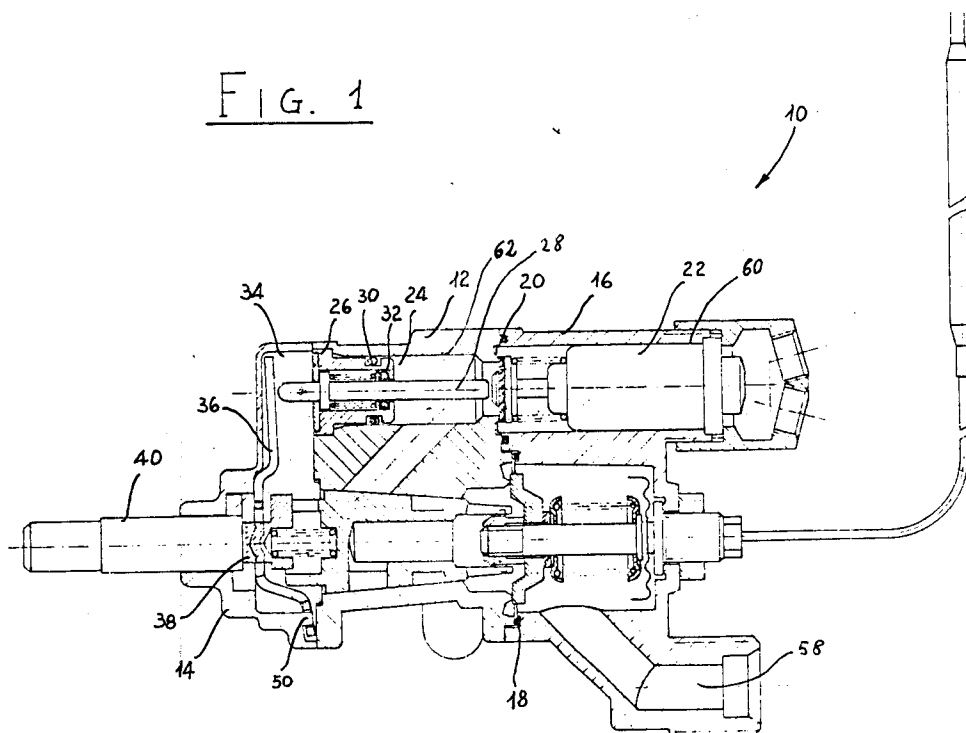
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I-28053 Castelletto Ticino (Novara)(IT)**UFFICIO BREVETTI CALCIATI S.r.l. via G.****Negri,10****I-20123 Milano(IT)**(54) **Improved thermostat with safety device.**

(57) Improved thermostat comprising a magnetic valve (22), the associated excitation members (28) arranged coaxially with each other and an activation lever (36) which acts on the excitation member in accordance with a perpendicular incidence. The le-

ver (36) has an elongated slot (52) opposite the coupling point with the operating shaft (40) and is equipped with hemispherical bosses (56) obtained on the opposed extended fronts of said slot.

FIG. 1**EP 0 486 913 A2**

The present invention relates to an improved thermostat with safety device.

More specifically the present invention relates to an improved thermostat with safety device especially suited for use in kitchen stove ovens.

As is known electrical household appliances which incorporate a cooking oven generally contain a heat regulating instrument designed to keep the temperature at a predetermined level by regulating the flow of gas to the heat sources.

In gas supplied ovens said heat regulation instrument generally comprises a valve which simultaneously regulates gas delivery and performs heat regulation.

Said valve is generally made of brass and comprises the ducts for passage of the combustible fluid, a magnetic safety valve and related excitation means.

In known thermostats the magnetic safety valve is arranged in accordance with an angular development in relation to the associated excitation means.

In addition, the activation member designed to intervene on the excitation means, usually consisting of a ring, is applied to the front of the valve and thus acts on the excitation means in a nonperpendicular manner.

This relative arrangement of the various members making up the valve provides limited operative sensitivity of the unit.

In addition, known valves, given the above mentioned location of the magnetic unit, have obligatorily a rather cumbersome size and gas supply is not optimal because of the nonlinear path it has to follow inside the body.

Other known thermostats call for the use of a flat lever as an instrument of activation of the means which excite the magnetic valve. However, this solution also is not free of drawbacks, again connected with the fact that the above mentioned lever does not operate perpendicularly on the excitation means. The front of the valve body is also rather cumbersome.

Known valves therefore do not provide an absolute guarantee as to reliability because of the tendency to yield which affects the contact zone between the activation lever and the magnet excitation means.

The object of the present invention is to obviate the above mentioned shortcomings.

More specifically the object of the present invention is to provide an improved thermostat usable preferably on especially compact gas cooking stoves for even fuel flow.

Another object of the present invention is to provide a thermostat capable of giving a high level of reliability and resistance in time and also easy and economical to manufacture.

These and still other objects are achieved by

the improved thermostat of the present invention basically characterized in that the magnetic unit and associated excitation means are arranged coaxially with each other and the activation member is a metal lever whose longitudinal axis is perpendicular to that of the excitation means. In particular the improved thermostat of the present invention comprises a container consisting of a main body, a front and a cap coupled to the body after interposition of one or more seals.

In this container are housed coaxially with each other the magnetic unit and the associated excitation means.

A lever housed in said front permits activation of said excitation means in accordance with a perpendicular incidence.

The construction and functional characteristics of the improved thermostat in the present invention can be better understood from the following description in which reference is made to the annexed drawings which show a preferred and non-limiting form of execution of the thermostat of the present invention and wherein:

FIG. 1 shows a schematic view of a longitudinal cross section of the improved thermostat of the present invention,

FIG. 2 shows a schematic side view of the activating lever which operates on the excitation means,

FIG. 3 shows a schematic plan view of the lever shown in FIG. 2,

FIG. 4 shows a schematic partial view of the lever of FIGS. 2 and 3,

FIG. 5 shows a schematic view of a cross section of the lever of FIG. 3 with a plane passing along line A-A of FIG. 3, and

FIG. 6 shows a schematic view of a cross section of the lever of FIG. 5 with a plane passing along line B-B of FIG. 5.

With particular reference to FIG. 1 the improved thermostat of the present invention comprises a container (10) consisting of a hollow body (12) with projecting front (14) preferably made of brass and a cap (16). The cap (16) is preferably provided of aluminium and is coupled with the hollow body (12) by means of general use screws or equivalent systems with interposed seals (18) and (20) housed in corresponding seats made in the front side of said cap (16).

The cap (16) is provided with a gas duct (58) and on the opposite side with a circular seat (60) with horizontal development and in which is inserted and fixed the magnetic valve (22).

Correspondingly the hollow body (12) is provided with a circular seat (62) in which is located the excitation means of the magnetic valve. The magnet (22) and the corresponding excitation means are arranged aligned and coaxial with each

other. The excitation means comprises a cap (26) provided with a through axial hole and a rod (28) or pin designed to act on the magnet (22) inserted in said hole and sliding therein.

A toric seal ring (30) ensures sealing of the cap (26) in the seat (62) of the body (12).

Similarly a second seal (32) ensures seal between the rod (28) and the cap (26).

The seal (33) is arranged in a seat made in the hole of the rod opposite the part from which emerges the rod (28) at the rear. The end of the rod (28) opposite that which makes contact with the magnetic valve (22) emerges from the cap (26) and is arranged in a chamber (34) delimited by the vertical wall of the hollow body (12) and the cap (26).

In the front (14) is inserted a pin (40) for regulation of the gas delivered. A metal lever (36) is fixed at one end to the wall of the hollow body (12), is inserted in the sleeve (38) and has its opposite end free and arranged in the chamber (34).

The free end of the lever (36) is aligned with the end of the pin (28) and their longitudinal axes are perpendicular to each other.

The lever (36) achieved preferably of metal by pressing and subjected to bending and drilling operations has a substantially U shape. Said lever (36) has an intermediate portion (44) and two lateral end portions (42) and (46) arranged on different planes, said portions being connected together by means of oblique intermediate sections (44') and (44'').

Opposite one of the end portions (42) is made a rectangular hole (48) in which is arranged during assembly a tongue (50) fixed on the wall of the hollow body (12) opposite the front (14).

On the portion (44) of the lever (36) is provided a slot (52). Said slot (52) has an enlargement (54) opposite the intermediate section (44). Said enlargement (54) extends in such a manner as to partially occupy the intermediate portion (44') also. Said structure may readily be seen by examining FIG. 4 which shows the lever (36) in its development before the bend made in it to provide its substantially U form.

As shown in particular in FIG. 2 and in greater detail in FIG. 6, at the sides of the slot (52) on each of the opposing fronts there is made a hemispherical impression (56). The function of said impression (56) is to create a boss or bosses against which acts the pin (40) for operation of the lever. Following the action of the pin (40) the free end portion (46) of the lever (36) comes in contact with and pushes the rod (28) which, consequently, acts on the magnetic valve 22.

The free portion (46) of the lever (36), provided with a fulcrum at (50) and arranged in the chamber

(34), acts on the front end of the pin (28) in accordance with an incidence perpendicular thereto, thus providing optimal results from the viewpoint of sensitivity and quickness of excitation of the magnetic valve (22).

The arrangement of the slot (52) and its extension (54) along the intermediate section (44') gives said lever considerable stiffening. At the point where said lever is fitted on the sleeve (38) it provides greater resistance to bending without in the least compromising the rotation of the pin.

As may be seen from the foregoing the many advantages of the present invention are evident.

The thermostat as a whole is particularly compact and has in particular limited size, especially as concerns the front, while the lever (36) which controls excitation of the magnet operates on the associated rod (28) perpendicularly and directly.

Particularly advantageous in view of the form of said lever (36) is the coaxial arrangement in the body of the valve of the magnetic unit and associated activation means.

This structural layout, in addition to the compactness of the system, ensures linear hence optimal gas supply inside the valve.

Finally, the considerable economies achievable in manufacturing and assembly, given the fact that an aluminium cap can be coupled to the thermostat body instead of creating a single base body, should not be overlooked.

Naturally the above description of an embodiment applying the innovative principles or the present invention is given merely by way of example and therefore is not to be taken as a limitation of the patent right claimed here.

It is also intended that the invention, although proposed specifically for gas cooking ovens, can be used in any equipment where heat regulation is required.

Claims

1. Perfected thermostat with safety device suitable for gas cooking stoves comprising a magnetic valve (22), excitation means (28) and an activation member (36) which acts on said excitation means characterized in that the magnetic valve (22) and the excitation means (28) are arranged coaxially with each other and the activation member is a metal lever (36) whose longitudinal axis is perpendicular to that of the excitation means.
2. Improved thermostat in accordance with claim 1 characterized in that the lever (36) consists of a metal lamination in a form substantially comprising an intermediate portion (44) and two lateral end U portions (42) and (46) ar-

ranged on different planes, said portions (42,44,46) being connected together by means of oblique intermediate sections (44',44'').

3. Improved thermostat in accordance with claim 2 wherein an end portion (42) of the lever (36) is provided with a rectangular hole (48), the intermediate portion (44) is provided with a slot (52) and the opposite end portion (46) is arranged near and in front of the rod (28) which activates the magnetic valve (22). 5
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4. Improved thermostat in accordance with claim 3 characterized in that the slot (52) has an enlargement (54) which extends in such a manner as to include partially the intermediate portion (44'). 15
5. Improved thermostat in accordance with any of the above claims characterized in that a tongue (50) fixed on the wall of the container is arranged in the rectangular slot (48) of the lever (36) and a sleeve (38) integral with the drive shaft (40) is inserted in the slot (52) of said lever (36). 20
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6. Improved thermostat in accordance with any of the above claims characterized in that the lever (36) has a hemispherical embossed impression (56) beside the slot (52) on each of the opposing sides thereof. 30
7. Improved thermostat in accordance with any of the above claims characterized in that the drive shaft (40) meets with the impressions (56) and leads the leg (46) of the lever (36) to contact, in accordance with a perpendicular incidence, the front end of the rod (28) which operates on the magnetic valve (22). 35
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8. Improved thermostat in accordance with any of the above claims characterized in that the magnetic valve (22), the excitation means (28) and the activation member (36) are arranged in a container consisting of a hollow body (12) with projecting front (14) of brass and an aluminium cap (16). 45
9. Improved thermostat in accordance with any of the above claims in which the shaft (40) is inserted in the front (14) and is provided with a sleeve (38) on which is fitted the lever (36). 50

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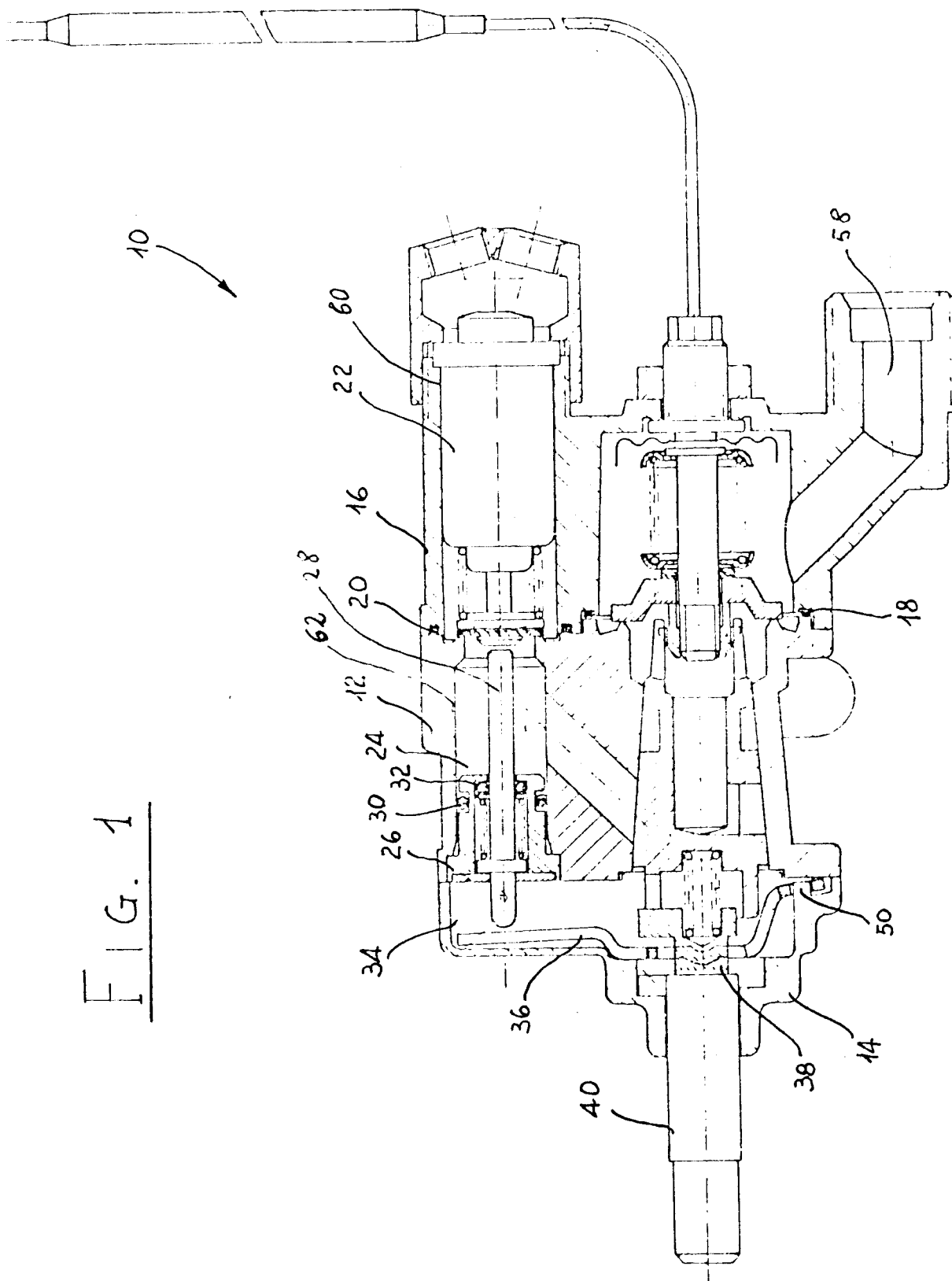


FIG. 2

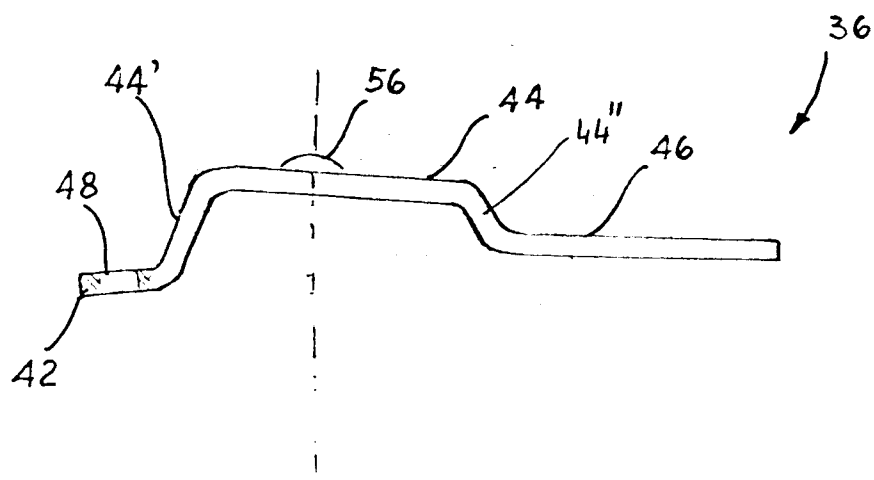


FIG. 3

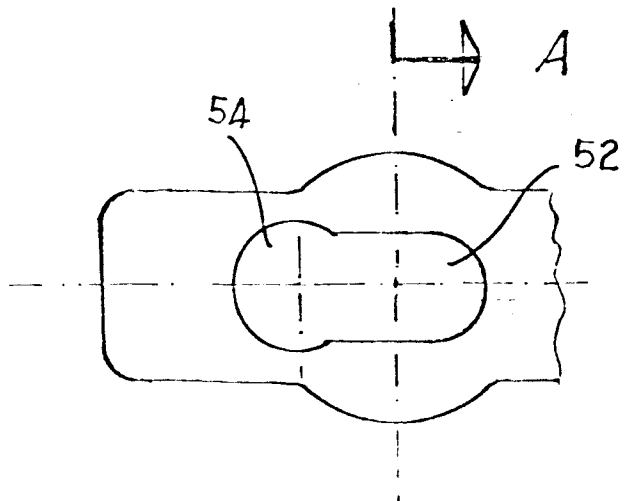
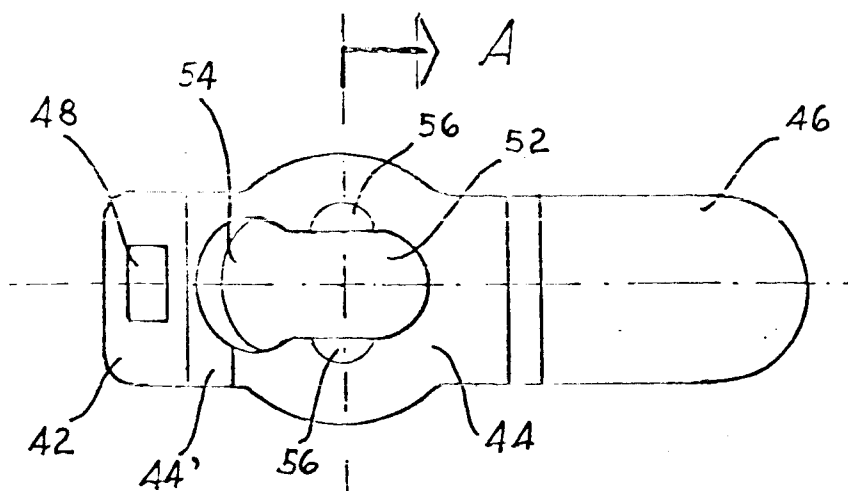


FIG. 4

FIG. 5

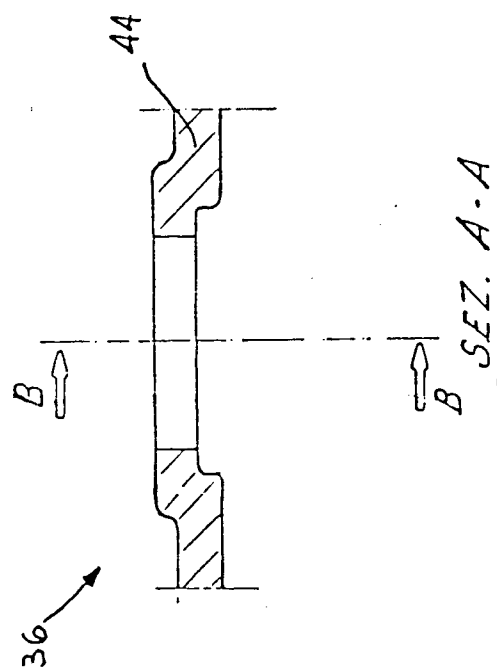


FIG. 6

