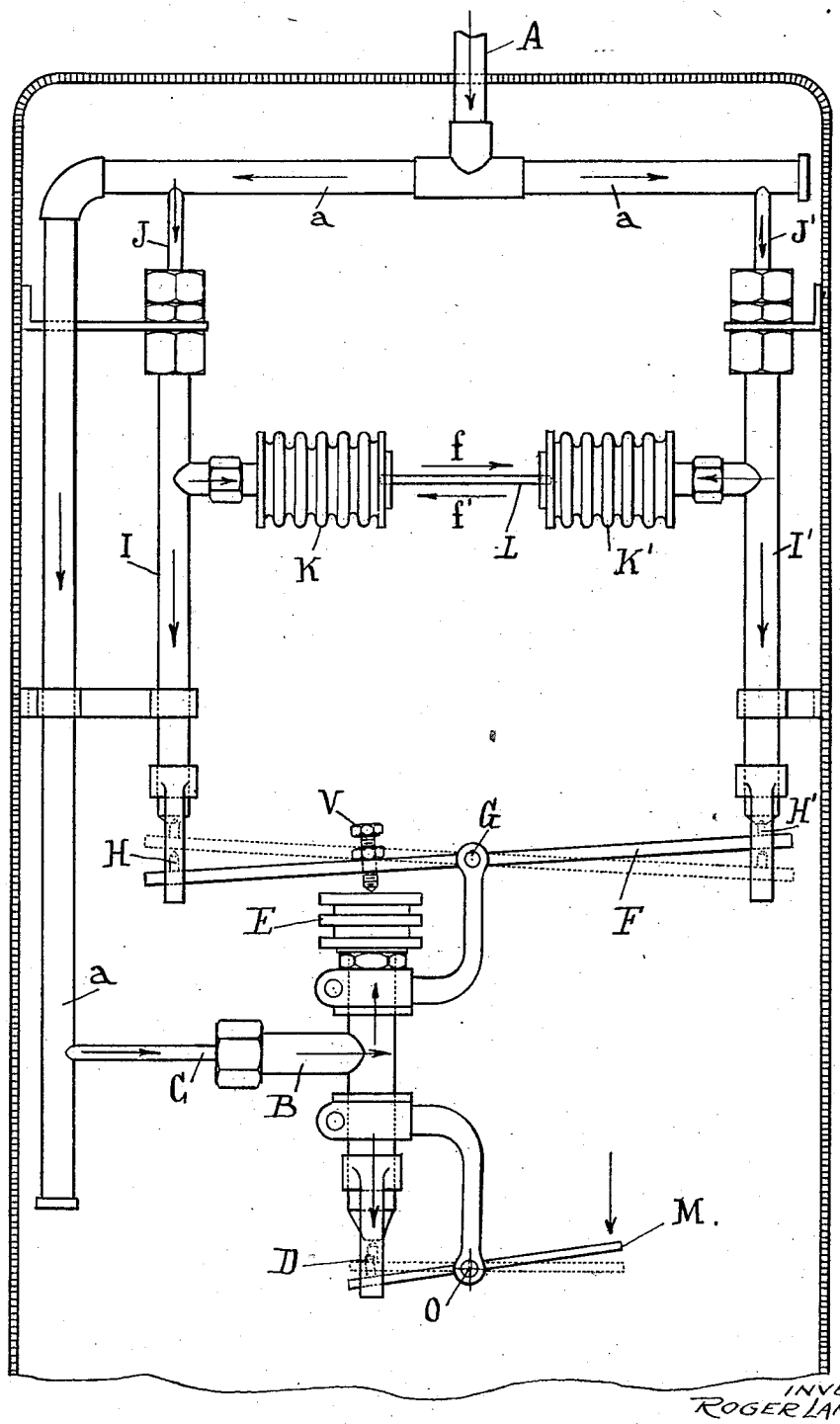
May 10, 1932. R. LANQUETIN 1,857,386

RELAY DEVICE FOR AUTOMATIC CONTROL BY THE USE OF A FLUID UNDER PRESSURE

Filed Feb. 5, 1930



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Patented May 10, 1932 1,857,386

UNITED STATES PATENT OFFICE

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RELAY DEVICE FOR AUTOMATIC CONTROL BY THE USE OF A FLUID UNDER PRESSURE

Application filed February 5, 1930, Serial No. 425,980, and in France February 9, 1929.

The present invention relates to a relay device for the automatic control of a regulating apparatus of any kind by the use of a fluid under pressure.

The object of this invention is to provide a device capable of creating variations in pressure in opposite directions simultaneously in two circuits by the displacement of a single member, with a view to utilizing these variations in pressure for the control of an automatic regulating apparatus, of a temperature, degree of humidity, etc.

It is known that it is not always easy to effect the control of such apparatus in an absolutely practical manner, in other words for obtaining the operation which is always perfectly secured. It is for this reason that it has been sought to obtain a combination which, while being simple in construction, will be capable of fulfilling this condition of being very sensitive without any possibility of getting out of adjustment.

The apparatus which will be described hereinafter utilizes a fluid under constant pressure, supplying a chamber the lower part of which can be closed or opened by a pivoted lever carrying a needle valve, while the other open end will be in communication with an expansible member such as capsules analogous to those employed in aneroid barometers; this member acting on an oscillating lever having the effect of closing and opening simultaneously one or the other of two other chambers supplied exactly like the first under determined conditions by the fluid under pressure employed, in order to produce in one or the other an increase or reduction in pressure; these chambers being each in communication with an expansible member analogous to the first, which expansible members are connected by their movable part to a rod, so that the following effect can take place, that, if the pressure rises in one of the chambers, the expansible member in communication with it, by expanding, pushes the other and vice versa.

The drawing attached to the accompanying description will enable this combination to be understood.

By referring to this drawing it is seen that the apparatus is supplied at A by a fluid under constant pressure filling the duct *a*. This fluid supplies a chamber B through a nozzle or orifice C communicating with the main duct *a*. The chamber B is closed or opened at its lower part by a needle valve D mounted at one of the ends of a lever M pivoted at O. The section of the needle valve is such that when it is opened the pressure in B is negligible; the nozzle or orifice D has in effect a section such that under these conditions a loss of charge is produced which is practically equal to the pressure of the fluid.

The chamber B communicates with an expansible member E formed either by a diaphragm or by a corrugated tube or by a manometric tube or by an analogous member which is deformed under the influence of variations in pressure.

The opening and closing of the needle valve D produces a deformation of E so that in its deformations E carries along a lever F rocking about the point G, the said lever being adjustable by means of a screw V.

Each of the ends of the lever F carries a needle valve H and H′ and each of these needle valves closes a chamber I and I′ supplied through a nozzle or orifice J and J′.

The variations in position of the lever F will have the effect of closing one of the needle valves and at the same time opening the other and thus of producing an increase in pressure in one of the chambers and a reduction in pressure in the other.

An expansible member analogous to E and in the case in point a corrugated tube K is connected to the chamber I and an identical member K′ is connected to the chamber I′. These two members K and K′ are connected by a rod I bearing upon the movable part of each of them. This rod thus follows the deformations of these members.

If the pressure rises in I, K expands and tends to push L in the direction of the arrow *f*. If the pressure rises in I′, K′ expands and tends to push L in the direction of the arrow *f*′. Thus if the needle valve D closes, E expands, closes H and opens H′; the pressure rises in I and falls in I′; K expands while K′ contracts; L moves in the direction of the

arrow *f*. If D opens, E opens H and closes H′; the pressure falls in I and rises in I′; K contracts, K′ expands and L moves in the direction of the arrow *f*′.

It will thus be understood that this device can be employed for the automatic regulation if D is controlled by an apparatus influenced by a variable, the value of which depends upon the position of L, which member L may be rigid with a regulating apparatus.

What I claim is:

A relay device for automatic regulation by the utilization of a fluid under constant pressure, comprising expansible members arranged in such a way that one of the members is in communication with a chamber having a valve at its lower part operated by a pivoted lever, an expansible member on the open end of said chamber and an oscillating lever, acted upon by the said expansible member, carrying at each end a needle valve controlling the closing and opening of two chambers, each in communication as desired with the fluid under pressure employed, each of the said two chambers communicating with an expansible member analogous to the first, the free ends of the said expansible members being connected together by a rod arranged to follow the deformations of these members.

In testimony whereof I have affixed my signature.

ROGER LANQUETIN.