No. 787,421. PATENTED APR. 18, 1905.

L. WOERNER.

FLUID PRESSURE DEVICE.

APPLICATION FILED JUNE 17, 1904.

2 SHEETS—SHEET 1.

Fig. 2.

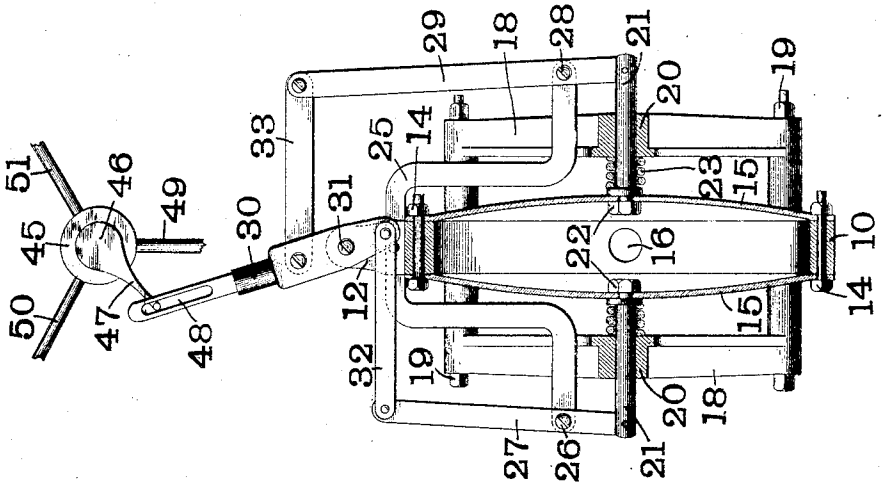
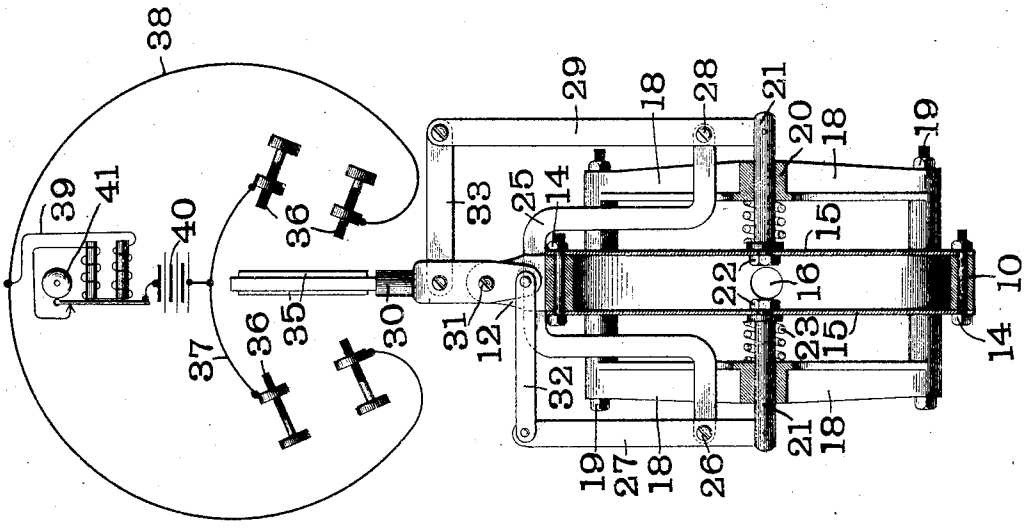


Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig.3.

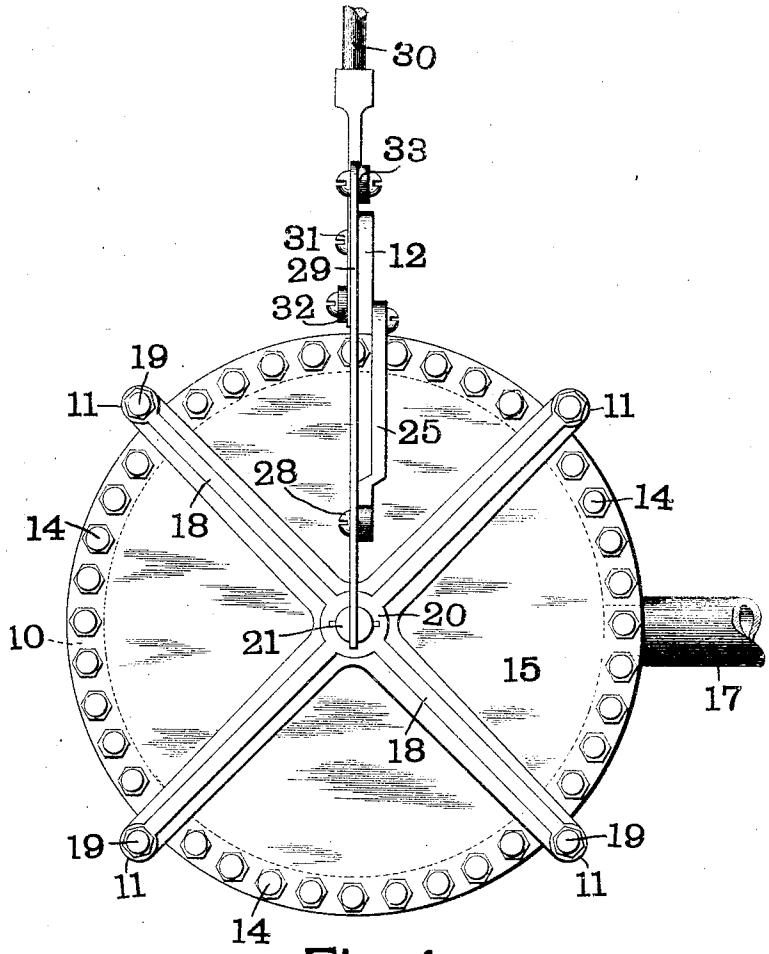
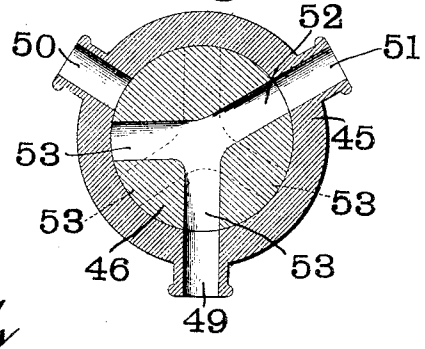


Fig.4.



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No. 787,421. Patented April 18, 1905.

UNITED STATES PATENT OFFICE.

LEO WOERNER, OF ST. LOUIS, MISSOURI.

FLUID-PRESSURE DEVICE.

SPECIFICATION forming part of Letters Patent No. 787,421, dated April 18, 1905.

Application filed June 17, 1904. Serial No. 212,956.

To all whom it may concern.

Be it known that I, LEO WOERNER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Fluid-Pressure Device, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a device which will be responsive to variation of fluid-pressure and which may be used either in connection with a suitable signal to give an alarm when the pressure is either too high or too low or with a suitable valve mechanism for automatically regulating the pressure.

My invention consists in various novel features and details of construction, all of which are described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, Figure 1 is a central section through the device, also showing diagrammatically a signal device. Fig. 2 is a view similar to Fig. 1, but showing the device connected with a valve mechanism. Fig. 3 is an enlarged side elevation, and Fig. 4 is an enlarged section, of the valve shown in Fig. 2.

Like marks of reference refer to similar parts in the several views of the drawings.

10 represents an annular member, preferably of cast metal. This annular member 10 is provided with four short lugs 11 and with a long lug 12. Secured to the annular member 10 by means of bolts 14 are a pair of diaphragms 15, preferably of thin sheet-brass. The ring 10, together with the diaphragm 15, form a chamber for the fluid, either liquid or gaseous, the pressure of which is to be indicated or regulated. Leading into this chamber is an inlet 16.

17 is a pipe which extends from the inlet 16 to the reservoir containing the fluid.

18 represents a pair of spiders which are secured by bolts 19 to the four short lugs 11, heretofore referred to. Each of the spiders 18 is provided at its center with a guideway 20, in which slides a rod 21. These rods 21 are secured, by means of nuts 22, to the diaphragms 15.

Between the diaphragm 15 and the spiders 18 and surrounding the rods 21 are coil-springs 23. These coil-springs 23 tend to force the diaphragms 15 toward each other.

25 is a yoke which is secured to the lug 12. Pivoted to one end of this yoke 25 at a point 26 is a short lever 27, and pivoted to the other end of the said yoke at a point 28 is a long lever 29. These levers 27 and 29 are in turn pivoted to the ends of the rods 21, hereinbefore described.

30 is an arm pivoted to the lug 12 at a point 31. The arm 27 is connected to the arm 30 by means of a link 32, and the lever 29 is connected with the said arm by means of a link 33.

When it is desired to use the device to operate a signal to give an alarm when the pressure is either too great or too small, the arm 30 is provided with a pair of contact-pieces 35, as shown in Fig. 1. These contact-pieces 35 are adapted to come in contact with adjustable terminals 36 when the arm 30 is moved a predetermined distance in either direction. The two upper terminals 36 are connected by means of a conductor 37 and the two lower terminals by means of a conductor 38. The conductors 37 and 38 are connected by means of a conductor 39, containing a battery 40 or other suitable force of electrical energy and a bell 41 or other signal device for giving an alarm. It will be evident that when the arm 30 is moved a sufficient distance in either direction one of the contacts 35 will bridge two of the terminals 36, thus completing the circuit through the bell and sounding the alarm.

In Fig. 2 the device is shown as connected to a valve mechanism for automatically regulating the pressure of the fluid. The valve is composed of an outer part or shell 45 and an inner part or plug 46. The plug 46 is provided with an arm 47, which engages with a slot 48 in the arm 30. The shell 46 of the valve is provided with a port 49, which leads to the reservoir containing the fluid. 50 is a supply-port, and 51 is a discharge-port. The inner part or plug 46 is provided with a Y-

shaped port having one branch, 52, adapted to be placed in communication either with the supply-port 50 or the discharge-port 51, and two branches 53, which are adapted to be brought into communication with the port 49, leading to the reservoir. It will be seen that when the pressure is normal, so that the diaphragms 15 stand substantially parallel, as shown in Fig. 1, the ports 52 and 53 will be in position shown in dotted lines in Fig. 4, and the fluid will neither be admitted to or from the reservoir. In case the pressure becomes too great the diaphragms will be forced apart against the pressure of the springs 23, as shown in Fig. 2, and consequently the arm 30 will be moved to the left, as shown in said figure, and the plug 46 of the valve will be turned, as shown in Fig. 4, to connect the reservoir with the discharge-port 51. In case the pressure should become too small the diaphragms will be forced together by the springs 23 and the valve would be moved in the opposite directions to connect the port 49 with the supply 50.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with a member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of levers pivotally supported from said member at points intermediate of their length, connections between said levers and said diaphragms, an arm having a pivot fixed with relation to said member, and connections between said levers and arm at each side of said pivot.

2. The combination with a member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a yoke secured to said member, levers pivoted to said yoke, rods connecting said diaphragms and levers, a pivoted arm, and links connecting said levers with said arm.

3. The combination with an annular member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of spiders secured to said annular member, rods carried by said diaphragms and sliding in said spiders, a pair of levers pivoted to said rods, an arm having a pivot fixed with respect to said annular member, and links connecting said levers with said arm at each side of said pivot.

4. The combination with an annular member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of spiders secured to said annular member, rods secured to said diaphragms and sliding in said spiders, springs interposed between said spiders and said diaphragms, a yoke secured to said annular member, levers pivoted to said yoke and connected to said rods, a pivoted arm, and links connecting said levers and said arm.

5. The combination with an annular member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of guides carried by said member, rods secured to said diaphragms and sliding in said guides, a pair of fixed arms carried by said member, levers pivoted to said arms and to said rods, an arm having a pivot fixed with relation to said member, and links connecting said levers with said pivoted arm at each side of said pivot.

6. The combination with an annular member, of a pair of diaphragms secured to said annular member and forming therewith a chamber for the fluid, a pair of spiders carried by said annular member, rods secured to said diaphragms and sliding in said spiders, a pair of fixed arms carried by said member, levers pivoted to said arms and to said rods, an arm having a pivot fixed with relation to said annular member, and links connecting said levers with said pivoted arm at each side of said pivot.

7. The combination with a member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of guides carried by said member, rods secured to said diaphragms and sliding in said guides, a pair of fixed arms carried by said member, a pair of levers each pivoted at a point intermediate of its length to one of said fixed arms, each lever also having one end pivoted to said rods, an arm pivoted at a point intermediate of its length to said member, a link connecting one of said levers to said pivoted arm at one side of its pivot, and a second link connecting the other of said levers to said pivoted arm at the other side of its pivot.

8. The combination with a member, of a pair of diaphragms secured to said member and forming therewith a chamber for the fluid, a pair of guides carried by said member, springs interposed between said diaphragms and guides, rods secured to said diaphragms and sliding in said guides, a pair of fixed arms carried by said member, a pair of levers each pivoted at a point intermediate of its length to one of said arms, each lever also having one end pivoted to one of said rods, an arm pivoted at a point intermediate of its length to said member, a link connecting one of said levers to said pivoted arm at one side of its pivot, and a second link connecting the other lever to said pivoted arm at the other side of its pivot.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

LEO WOERNER. [L. S.]

Witnesses:
M. L. BONFILS,
D. C. BETJEMAN.