

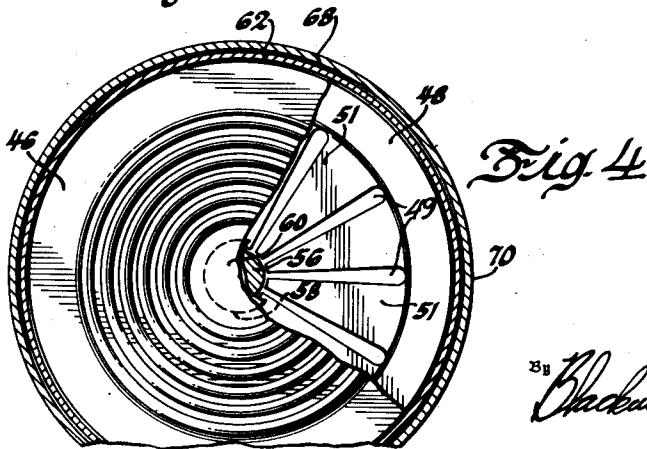
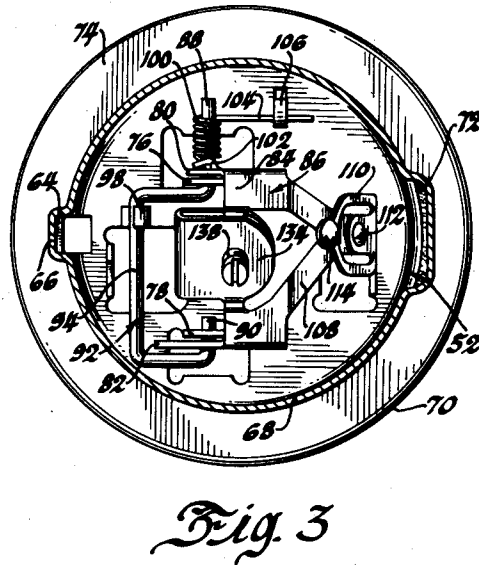
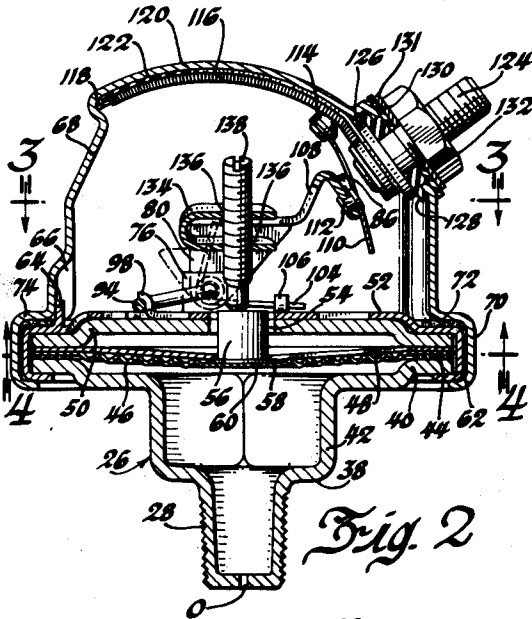
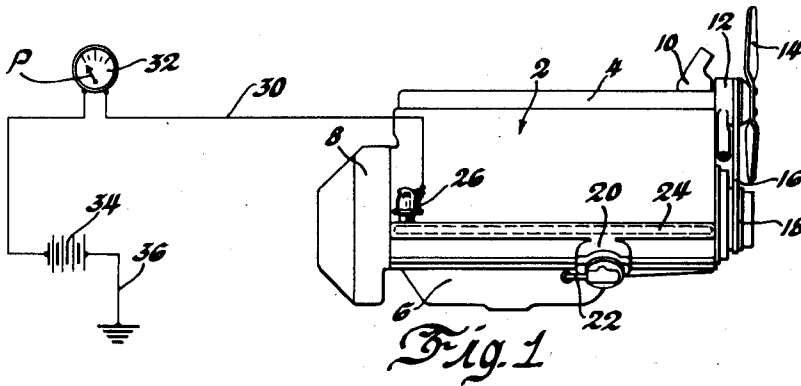
June 16, 1942.

R. CLASON

2,286,717

ELECTRIC OIL PRESSURE GAUGE

Filed Dec. 4, 1940



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UNITED STATES PATENT OFFICE

2,286,717

ELECTRIC OIL PRESSURE GAUGE

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Application December 4, 1940, Serial No. 368,431

6 Claims. (Cl. 201-48)

This invention relates to a telemetric oil pressure indicating system and has particular reference to its application to the oil circulating system of the internal combustion engine of an automotive vehicle. The novelty of the invention resides in specific details of construction of an engine unit which is applied to the engine. In the unit there is positioned a diaphragm subject to the pressure of the force feed oiling system of the engine. The movement of the diaphragm caused by the oil pressure moves a lever which causes a contact to move over a resistance and to put more or less resistance in an electric circuit. A galvanometer in the circuit will indicate the amount of current passing through the circuit, and by graduating the dial of the galvanometer in pressures instead of electric units, the pressure in the oil circulating system may be read directly on the galvanometer dial.

On the drawing:

Figure 1 is a view of an internal combustion engine with the engine unit applied and showing the circuit of the telemetric system.

Figure 2 is a sectional detail view through the engine unit of the engine.

Figures 3 and 4 are sectional detailed views on the corresponding lines of Figure 2.

Referring to the drawing, the numeral 2 indicates an internal combustion engine as a whole. The engine has the engine head 4, the oil pan 6, and the clutch housing 8. At the top of the engine head 4 there is the casting 10 of the water circulating system. The water is moved through the system by means of a pump enclosed in a casting 12 secured to the front of the engine block. On the water pump shaft there is also mounted the usual fan 14 and both the fan and pump are driven by a belt 16 operated from a wheel 18 secured on the exterior of the crankshaft to the engine.

A suitable housing 20 at the side of the crankcase of the engine houses the usual oil pump driven from the crankshaft of the engine. A pipe 22 leads from the oil pan 6 to the pump in the housing 20. The pump draws the oil from the oil pan and passes it to an oil manifold 24. From the oil manifold suitable ducts or pipes lead to the various parts to be lubricated.

The parts so far described are conventional, and per se form no part of the invention.

The invention itself is concerned with the engine unit 26 of the telemetric oil circulating system. This unit is provided with a screw-threaded neck 28, by means of which it is secured to

or mounted at one end of the oil manifold 24. From the engine unit 26 a wire 30 leads to a galvanometer 32 which is usually mounted on the instrument panel of the vehicle. The usual battery is indicated at 34 and the ground connection at 36.

Referring to Figure 2, the engine unit 26 comprises the base 38 which has the screw-threaded neck 28 at one end and the flared flat seat 40 at the other end. Intermediate the neck 28 and the seat 40, the base is quadrangular in shape as indicated at 42.

On the seat 40 at the periphery of the base member, an annular gasket 44 is placed and upon the gasket there is received the edge of a diaphragm 46 which is preferably made with annular corrugations. Over the diaphragm there is placed the disc spring 48 the details of which are best disclosed in Figure 4. The spring has its center cut away and there are cut in the disc a plurality of radial slots 49 which form fingers 51 therebetween with the points of the fingers at the center of the disc spring. The slots 49 are equally spaced and the fingers 51 are of the same size. The spring constantly urges the diaphragm downwardly when considering the construction of Figure 2.

Over the disc spring 48 there is placed a relatively flat retainer element 50. The edge of the element 50 is bent away from the main part and seats on the periphery of the disc spring 48. Over the retaining element 50 there is positioned a mounting plate 52. The retaining member 50 and the plate 52 each has a central opening 54 therein, the purpose of which is to enable a stud 56 to project therethrough. The stud 56 has a relatively flat head 58 which rests on the flat central part 60 of the diaphragm and over which there are received the ends or tips of the fingers 51.

The edge of the mounting plate 52 is bent around and overlaps the edges of the seat 40, the diaphragm 44, spring disc 48, and retainer 50, as shown at 62 in Figure 2. This turned over part 62 of the mounting plate 52 rigidly holds the base, the diaphragm, the spring disc and the retainer 50 together. A fluid-tight connection is formed because the gasket 44 is compressed when part 62 is applied.

At one side of the mounting plate 52 a tongue 64 is struck up therefrom and this tongue 64 fits into a recess 66 formed in a cap or housing 68 which fits over the base member and its associated parts. This cap or housing 68 is secured to the base member by means of the turned over

edge 70. A suitable gasket 72 is positioned between the shoulder 74 on the turned over part 70 and adjacent the plate 52 to form a fluid-tight connection. The finger 64 and the recess 66 are for the purpose of accurately positioning the housing on the remainder of the structure.

The mounting plate 52 has ears 76 and 78 thereon formed by pressing metal away from the plane of the mounting plate. Outside these ears there are received the legs 80 and 82 of the U-shaped part 84 of a lever indicated as a whole at 86. The ears 76 and 78 as well as the legs 80 and 82 have mating openings in which there are received the journals 88 and 90 of a journal member 92. This member 92 is formed into U-shape intermediate the journals 88 and 90 as indicated by the numeral 94. The part 94 is held to the mounting plate 52 by the ends of a lug 96 pressed from the plane of the mounting plate 52. The journals 88 and 90 serve pivotally to mount the lever 86.

A coil spring 100 is coiled about the journal 88 and has one end thereof held to the leg 80 by means of a finger 102 bent from the side of the leg 80. The other end 104 of the spring is held to the mounting plate 52 by means of a lug or finger 106 formed from the plane of the mounting plate 52.

The lever 86 has an arm 108 formed as a continuation of the base of the U-shaped part 84. As is best shown in Figure 3, the arm 108 has a V shape where it joins onto the U-shaped part 84 and terminates in a goose-neck arm as is best shown in Figure 2. The end of the arm has the spring 110 secured thereto by a rivet 112 and the end of the spring 110 has secured thereto a contact 114. The shape of the spring arm 110 is best shown in Figure 3. This contact 114 is adapted to move over a wire resistance element 116 which is wound around a non-conducting strip 118 and is spaced from the top 120 of the housing by means of the insulating material 122.

The resistance 116 has a contact stud 124 secured at one end. This stud passes through an opening in the top 120 of the housing 68. The stud has a head 126, spaced from the housing by the insulating member 128. An insulating washer 130 is positioned on the outside of the housing and a metal washer 131 and a nut 132 hold the stud tightly on the housing and out of electrical contact therewith.

Referring again to the lever 86, and particularly to the base of the U-shaped part 84, it will be seen that the metal thereof is bent into U shape as indicated at 134. This U-shaped part 134 is merely formed by turning the metal on itself and is bent into a plane which is at an incline to the plane of the remainder of the base of the U-shaped part 84. This is best seen in Figure 2. Both legs of the U-shaped part 134 are provided with threaded openings 136 into which there is screwed the adjusting screw 138. The lower end of the adjusting screw is rounded and rests on the top of the stud 56. By turning the screw 138 one way or the other, the unit may be calibrated so that the contact 114 is at such a position on the resistance that the pointer P of the galvanometer 32 will be at the zero position on the scale when there is no pressure in the oiling system. The pressure of the oil which passes through the opening O in the bottom of the screw-threaded neck 28 of the base element 30 will cause the diaphragm 46 to move upward (with reference to Figure 2) against the spring 48 to cause the stud 56 to move the screw 138

which in turn will swing the lever on its journals 88 and 90 thereby to cause the arm 108 to move the contact 114 over the resistance 116 to place additional resistance in the circuit. Due to the increase in the resistance, the pointer P will now move from the zero end of the scale, as shown in Figure 1, to the other end to indicate the amount of pressure in the oiling system.

To adjust the position of the point of the screw 138 on top of the stud 56 the lever 86 can be bent in all directions at the thin section connecting the lever to the U-shaped part 134. This bending can take place at either side or both sides of supporting part 134. After this adjustment is made to take care of the particular diaphragm and backing spring used in the unit, the screw 138 can be turned in one direction or the other to effect calibration. The screw 138 is therefore capable of axial adjustment by turning it, and bodily adjustment angularly with respect to the diaphragm by bending or twisting the thin sections.

Suppose that the pointer is at the position on the scale which indicates the normal or desired oil pressure. If for any reason, such as due to the lack of oil, or the failure of the oil pump, there will be a decrease in the pressure of the system, this decrease in the pressure will at once affect the position of the diaphragm 46. The spring 48 will cause the diaphragm to move toward the position shown in Figure 2, and as the diaphragm moves toward this position the spring 100 will move the lever to cause the contact 114 to move toward the position it occupies in Figure 2. This will change the resistance of the engine unit in the circuit and cause the pointer P to move toward the zero position in Figure 1 and indicate the deficiency in pressure in the oil circulating system.

I claim:

1. In an engine unit of a telemetric indicating system, a base mountable on the engine, a diaphragm positioned on the base, said base having an opening to enable oil from the oil circulating system of the engine to reach the diaphragm and exert pressure thereon, a spring biasing the diaphragm in opposition to the oil pressure, means to hold the diaphragm and the spring on the base, a housing mounted over and secured to the base, a resistance mounted in the housing and forming part of an electric circuit, a contact movable along the resistance, and means for effecting relatively large movements of the contact along the resistance in response to movements of the diaphragm, said means including lever means for moving the contact, means extending between the diaphragm and the means to cause movement of the means in response to movement of the diaphragm, and a mounting for the last-named extending means providing for adjustment of said extending means to vary the effective distance between the diaphragm and the lever means and to vary the angular relation of said extending means with respect to the diaphragm.

2. In an engine unit of a telemetric indicating system, a base mountable on the engine, a diaphragm positioned on the base, said base having an opening to enable oil from the oil circulating system of the engine to reach the diaphragm and exert pressure thereon, a disc spring positioned on the diaphragm to bias it in opposition to the oil pressure, a retainer positioned on the disc spring, a mounting plate positioned over the retainer and securing the base, the diaphragm,

the spring and the retainer together, a lever having a U-shaped part the two legs of which are pivotally mounted on said plate and an arm extending away from the U-shaped part, a housing mounted over the lever and secured to the base, a resistance mounted in the housing and forming part of an electric circuit, a contact mounted on the arm and adapted to move over the resistance in response to movements of the lever, and an adjusting screw mounted in the bight of the U-shaped part of the lever and extending axially between the two legs of the U-shaped part and between the diaphragm and the lever to cause movement of the lever in response to movement of the diaphragm.

3. In an engine unit of an electric telemetric oil pressure indicating system, a base mountable on the engine, a diaphragm mounted in the base, a lever pivoted on the unit, a contact mounted on the lever and adapted to move over a resistance element to change the amount of resistance in an electrical circuit, means extending from the lever to the diaphragm to cause movements of the diaphragm to be transmitted to the lever, said means including a member for varying the effective distance between the lever and the diaphragm, and supporting means for said member mounted on the unit for universal angular movement with respect to the diaphragm, whereby adjustment and calibration of the unit may be effected.

4. In an engine unit of an electric telemetric oil pressure indicating system, a base mountable on the engine, a diaphragm mounted in the base, a lever pivoted on the unit, a contact mounted on the lever and adapted to move over a resistance element to change the amount of resistance in an electrical circuit, a screw extending from the lever toward the diaphragm to

cause movements of the diaphragm to be transmitted to the lever, said screw being axially adjustable by turning it, and supporting means for said screw twistably mounted on the unit for universal angular movement with respect to the diaphragm, whereby the unit may be adjusted and calibrated.

5. In an engine unit of an electric telemetric oil pressure indicating system, a base mountable on the engine, a diaphragm mounted in the base, a lever pivoted on the unit, a contact mounted on the lever and adapted to move over a resistance element to change the amount of resistance in an electrical circuit, said lever having a supporting part and a relatively thin bendable part connecting the supporting part to the remainder of the lever, and adjustable means mounted on the supporting part of the lever and extending between the diaphragm and lever to cause movements of the diaphragm to be transmitted to the lever, whereby universal adjustment of said means and calibration of the unit may be effected.

6. In an engine unit of an electric telemetric oil pressure indicating system, a base mountable on the engine, a diaphragm mounted in the base, a lever pivoted on the unit, a contact mounted on the lever and adapted to move over a resistance element to change the amount of resistance in an electrical circuit, said lever having a supporting part and relatively thin bendable parts connecting the supporting part to the remainder of the lever, and a screw mounted on said supporting part and extending between the diaphragm and lever to cause movements of the diaphragm to be transmitted to the lever, whereby axial and bodily adjustments of the screw and calibration of the unit may be effected.

RAGNAR CLASON.

CERTIFICATE OF CORRECTION.

Patent No. 2,286,717.

June 16, 1942.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 58, claim 1, before "means" both occurrences, insert the word --lever--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of August, A. D. 1942.

Henry Van Arsdale,

Acting Commissioner of Patents.

(Seal)

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