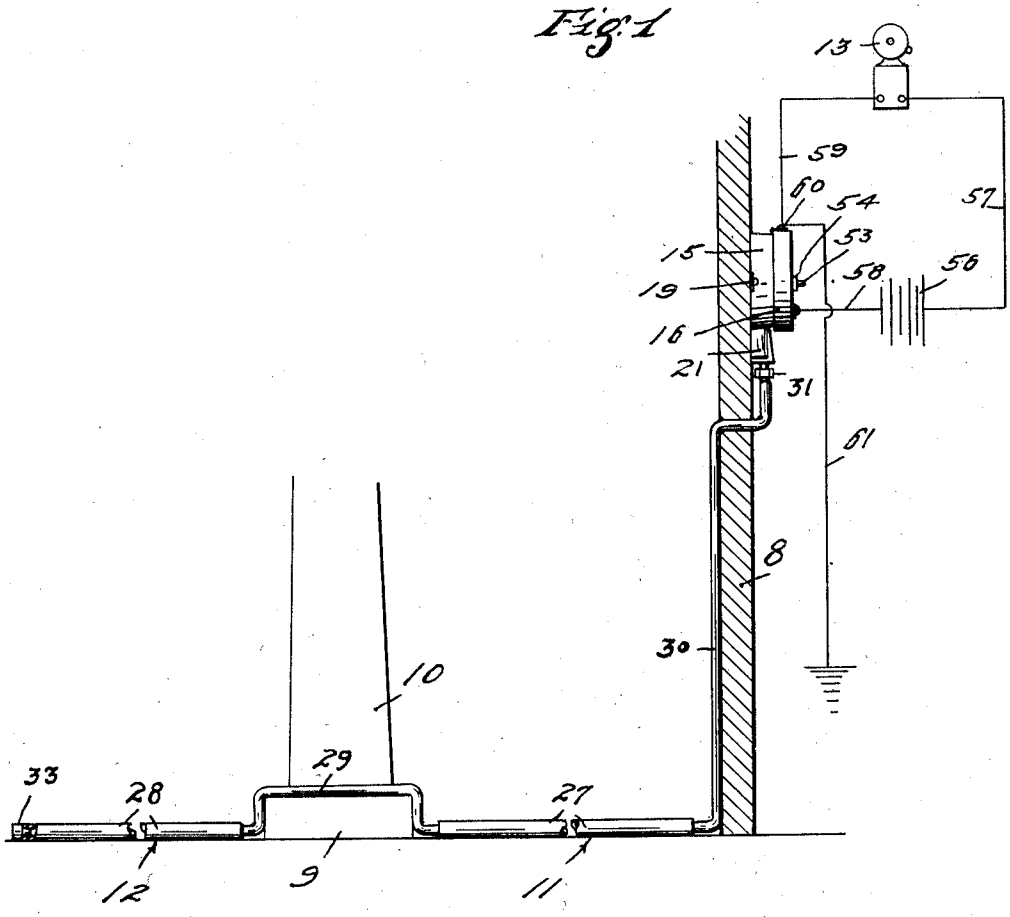
July 29, 1941. W. F. WESLEY ET AL 2,251,180

SERVICE CALL DEVICE

Filed July 24, 1939 2 Sheets-Sheet 1

Fig. 1




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Filed July 24, 1939 2 Sheets-Sheet 2

Fig. 2

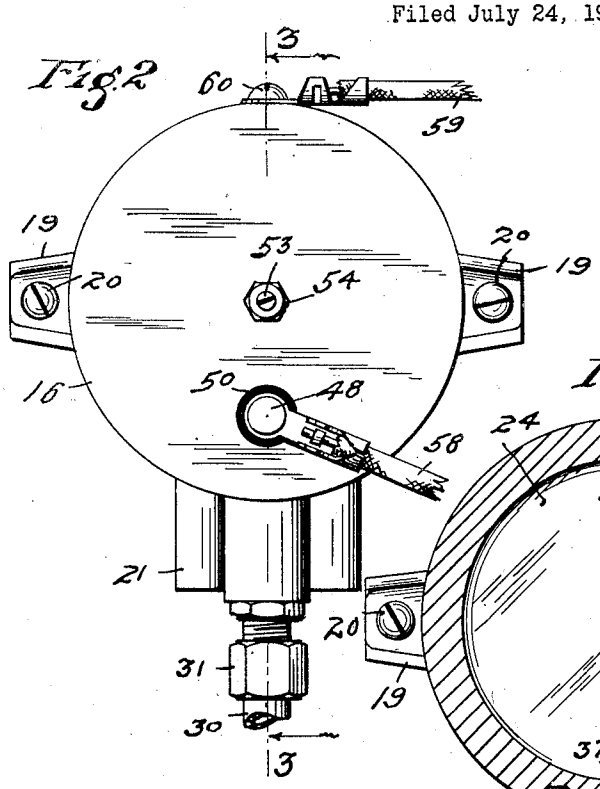



Fig. 3

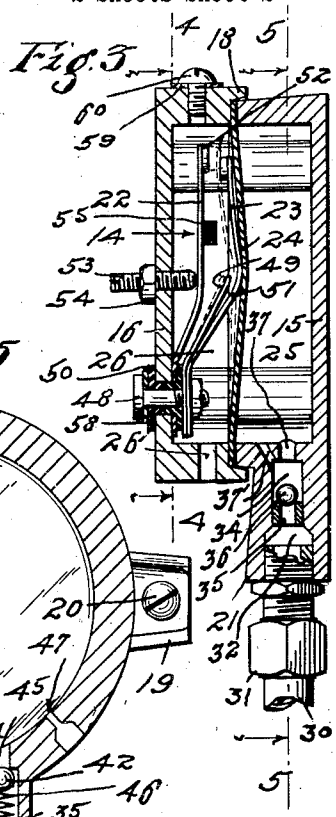



Fig. 5

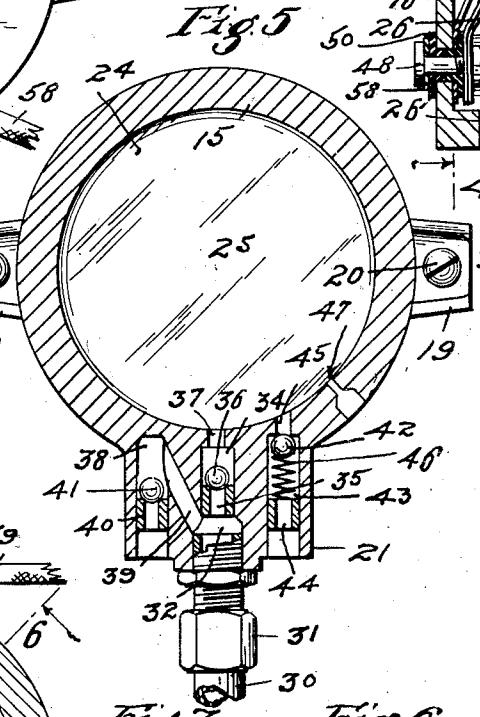



Fig. 4

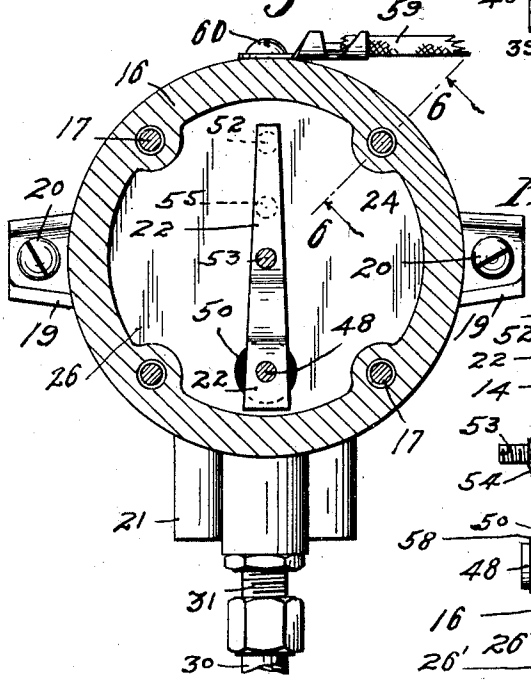
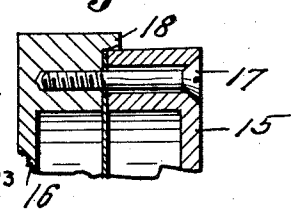



Fig. 7




Fig. 6




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Patented July 29, 1941

2,251,180

# UNITED STATES PATENT OFFICE

2,251,180

## SERVICE CALL DEVICE

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Application July 24, 1939, Serial No. 286,070

4 Claims. (Cl. 200—86)

Our present invention relates to a service call device which may be either visual or audible, and of a type actuated either directly or indirectly by an impulse produced by the impact of a moving object, such for instance, as a person stepping on a bag-like mat or the movement of one or more of the wheels of a vehicle, over an air hose or other actuator laid across a driveway.

The invention, while intended for general use, is especially well adapted for use in connection with gasoline or other service stations where the attendant is often occupied with work where he cannot see a vehicle driven up to the dispensing device.

The objects of this invention are to provide a service call device which, when once set into action, by an impulse produced by an impact of short duration on an actuator, will continue to operate for a given period of time after the force imparting the impact is no longer effective.

Said invention further provides automatic means for controlling the force of an impulse, irrespective of the weight of the load imparting the same, or the area on the actuator covered thereby.

The invention still further provides manually operated means for varying at will, the duration of the signal. A further object of the invention is to provide means for interrupting the signal so that there are two relatively short signals instead of one long one. Another object of the invention is to provide a service call device that will not be affected by climatic conditions. Other objects of the invention will hereinafter appear.

To the above end generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings—

Fig. 1 is a view partly in elevation and partly in section showing an installation of the improved device, and also showing the wiring diagram therefor;

Fig. 2 is a face view of the control unit;

Fig. 3 is a view principally in section taken on the line 3—3 of Fig. 2;

Figs. 4 and 5 are views principally in section taken on the lines 4—4 and 5—5 of Fig. 3 respectively;

Fig. 6 is a fragmentary view principally in section taken on the line 6—6 of Fig. 4, and;

Fig. 7 is a fragmentary view corresponding to Fig. 3 but showing the contacts separated to interrupt the call or signal during the operation thereof.

For the purpose of showing the invention applied in working position, there is illustrated in the drawings, one of the walls of a building, hereinafter referred to as the service station 8. There is also shown an island 9 on which is mounted a gasoline dispensing pump 10, some parts being broken away. Between the station 8 and the island 9 is an inner driveway 11 and outward of said island is an outer driveway 12.

The improved service call device as shown, is an electric bell 13 but may be a chime or any other suitable signal either audible or visual. This bell 13 may be located anywhere in the station 8 or wherever the signal will be most effective. If necessary or desirable, two or more of the bells 13 may be interposed in the bell circuit and located at different points, for instance; at a grease pit, shop, or the like.

The electric circuit for the bell 13 includes a normally open switch 14 which forms a part of the control unit and is mounted in a round metallic box or casing 15 having a removable metallic cover 16, detachably secured thereto by a plurality of screws 17. These screws 17 loosely extend through bores in the side wall of the box 15, have screw threaded engagement with the cover 16 and their heads are countersunk in the bottom or back of said box. The cover 16 has a capping flange 18 which covers the joint between the box 15 and its cover 16. Integral with the side of the box 15 is a pair of diametrically opposite, apertured ears 19 through which screws 20 loosely extend and secure the box 15 to the inside wall of the station 8. Also integral with the box 15, at the bottom thereof, is a depending housing 21 for triple valves.

The switch 14 includes cooperating fixed and movable contacts 22 and 23, respectively. Said movable contact 23 is operated to close the switch 14 by a diaphragm 24 clamped, at its marginal edge portion, between the opposing rims of the box 15 and its cover 16. This diaphragm 24 affords an air tight partition between the box 15 and its cover 16 and forms on one side thereof, within the box 15, an air compartment 25, and on the other side thereof, within the cover 16, a switch compartment 26, in which the switch 14 is mounted.

Air is forced into the air compartment 25 by one or more impulses produced in either one of two hose sections 27 and 28 by the passing of one or more of the wheels of a vehicle thereover.

These hose sections 27 and 28 are laid transversely across the driveways 11 and 12, respectively, and their adjacent ends are connected across the island 9 by a pipe 29. The other end of the hose section 27 is connected by a pipe 30 to a coupling 31 in the outer end of a central bore 32 in the valve housing 21. A plug 33 closes the outer end of the hose section 28.

Forming a continuation of the bore 32, but of a reduced diameter, is a bore-like air chamber 34 into the lower end of which is pressed a sleeve 35. Within the air chamber 34 is a ball valve 36 which is gravity seated on the inner end of the sleeve 35. A port 37, of a lesser diameter than the air chamber 34, connects said chamber to the air compartment 25. Obviously, the valve 36 is free to operate between the sleeve 35 and the port 37 but cannot enter the air compartment 25 through the port 37 due to the reduced diameter of said port. Air forced into the passageway 32 from either hose section 27 or 28 will lift the valve 36 from its seat and allow air to enter the air compartment 25 through the port 37 and then said valve will close to prevent the escape of air from the compartment 25. In case the valve 36 when open, should accidentally seat in the upper end of the air chamber 34 and thereby close the port 37 during the intake of air into the air compartment 25, a by-pass 37' connects said chamber to the air compartment for the air.

After air has been expelled from the hose sections 27 and 28 by an impact on one thereof, said sections are again refilled to atmospheric pressure through an air chamber 38 in the housing 21 at one side of the air chamber 34, and which chamber is connected by a port 39 to the air passageway 32. A sleeve 40 is pressed into the outer end of the air chamber 38, connects said chamber to atmospheric pressure and a ball valve 41 in the air chamber 38 is normally gravity seated on the inner end of said sleeve. This valve 41 is free to operate between the sleeve 40 and the upper end of the air chamber 38 and cannot enter the port 39 due to the reduced diameter thereof. Obviously, partial vacuum produced in one of the hose sections 27 and 28, by air forced therefrom into the air compartment 25 by an impact on one of said sections will lift the valve 41 from its seat and allow air to flow into the air chamber 38 until the hose sections 27 and 28 are again refilled to atmospheric pressure.

To prevent the air compartment 25 from being filled with air beyond a predetermined pressure, we provide a relief ball-valve 42 in an air chamber 43 formed in the housing 21 on the opposite side of the passageway 32 from the air chamber 38. A sleeve 44 pressed into the lower end of the air chamber 43 connects said chamber to the atmosphere and a port 45 connects the air compartment 25 to the air chamber 43. The valve 42 is yieldingly held seated on the inner end of the air chamber 43 by a coiled spring 46, compressed between the valve 42 and the sleeve 44, and normally closes the port 45.

Air forced into the air compartment 25 as heretofore described, will press the diaphragm 24 into the switch compartment 26 to close the switch 14, as will be presently described, and to reduce air pressure in said compartment and allow the switch to open, there is formed in the side wall of the box 15, a small air vent 47, having a much smaller air conducting capacity than the port 37 and through which vent 47 air in the compartment 25 gradually escapes until air remaining in said compartment is reduced to atmospheric pressure. This air escape vent 47 also performs another important function to wit: it permits air to escape from the compartment 25 in hot weather when the same starts to expand and thus prevents sufficient air pressure from being built up in the compartment 25 to operate the diaphragm and thereby close the switch 14. A breather port 26' in the wall of the cover 16 permits free movement of air under atmospheric pressure therethrough, during the operation of the diaphragm 24.

Referring again to the switch 14, its contacts 22 and 23 are each in the form of a leaf spring and which contacts project upright in the compartment 25 and are anchored at their lower ends to the cover 16 by a post 48 in the form of a headed and nut equipped bolt. The fixed contact 22 at the post 48 bears flatwise and directly against the inner face of the cover 16.

A leaf tension spring 49 is interposed between the contacts 22 and 23 and is also anchored to the cover 16 by the post 48. The contact 23 and the spring 49 bear directly, the one upon the other, directly engage the post 48, which extends through bores therein and the nut on said post bears directly on the contact 23. A pair of insulating washers 50 insulate the spring 49 from the contact 22 and also insulate the post 48 from said contact and the cover 16.

The contact 23 which is next to the diaphragm 24 has an intermediate hump 51 with which said diaphragm, at its central portion engages. Fixed to the free ends of the contacts 22 and 23 on the opposing faces thereof are cooperating tungsten points which are normally separated. To vary the gap between the points 52 and thereby govern the length of time the switch 14 remains closed, we provide an adjusting stud 53. This stud 53 has screw threaded engagement with the cover 16 and its inner end, which projects into the switch compartment 26 impinges against the contact 22 substantially at its longitudinal center. In the outer end of the stud 53 is a nick for a screw driver by which said stud may be turned. A lock nut 54 on the outer end portion of the stud 53 impinges against the cover 16 and holds said stud when set.

An abutment 55 of insulating material interposed between the contacts 22 and 23 is fixed to the contact 22, between its free end and the stud 53, and normally spaced from the contact 23.

The purpose of this abutment 55 will presently be described.

The electric circuit for the bell 13, includes a battery 56, to one side of which, said bell is connected by a wire 57; and a wire 58 leading from the other side of said battery is attached to the post 48 and thereby connects the movable contact 23 and its spring 49 to the battery 56. The bell 13 is indirectly connected to the fixed contact 22 by a wire 59 which leads from said bell to a binding post 60, in the form of a screw that has screw threaded engagement with the cover 16 and from thence, the circuit is through said cover to the fixed contact 22. A ground wire 61 is attached to the binding post 60.

*Operation*

The operation of the above described invention may be briefly described as follows; a vehicle approaching the pump 9, on either one of the driveways 11 or 12, will pass over the respective hose section 27 or 28, and the impact of the wheels

thereon will produce one or more impulses that force air therefrom and cause the same to open the valve 36 and enter the compartment 25 through the port 37. As air pressure in the compartment 25 is increased the diaphragm 24 will be pressed against the hump 51 on the movable contact 23 and move the same first into engagement with the spring 49 which automatically increases the tension of the contact 23; further closing movement of said contact will bring its point 52 into engagement with the cooperating point 52 on the fixed contact 22 and thereby close the switch 14 and complete the bell circuit and start the ringing of the bell 13; still further movement of the contact 23 by the diaphragm 24 will bring the same into engagement with the abutment 55. Pressure of the movable contact 23 on the abutment 55, under the action of the expanding diaphragm 24, will spring its free end portion away from the contact 22 and thereby separate the points 52, see Fig. 7, and thus interrupt the signal, or in other words, stop the ringing of the bell 13.

As air pressure in the compartment 25 is built up, it starts to escape to atmosphere through the vent 47 but of course at a much slower rate than that at which it enters the compartment 25 through the port 37.

As air pressure in the compartment 25 is reduced, by its escape through the vent 47, the movable contact 23, which at this time is held under considerable tension by the diaphragm 24, will start to overcome air pressure on said diaphragm and return said diaphragm to normal position. During the initial return movement of the contact 23 it moves out of engagement with the abutment 55 and again brings its point 52 into re-engagement with the point 52 on the fixed contact 22, this again completes the bell circuit, and starts the second half of the signal or the ring of the bell 13. Continued return movement of the contact 23 will finally open the switch 14 by separating the points 52 and thereby complete the call or signal.

Adjusting the stud 53 to move the fixed contact 22 toward the movable contact 23, will retard the opening of the switch and thereby increase the length of the call or signal. A reverse movement of the stud 53 will separate the contacts 22 and 23 thereby decreasing the length of the call or signal. The release valve 42 will compensate for variable air pressure, produced in the compartment 25 by the different number of tires passing over one of the hose sections 27 and 28, or by tires of different sizes, or by vehicles having dual tires, or by vehicles carrying loads of different weights.

The primary object of the spring 49 is to increase the tension of the movable contact 23 as the same is moved toward the contact 22 and thereby prevent the switch 14 from being closed by a person stepping on one of the hose sections 27 and 28 or by a bicycle being ridden thereover.

During the inflation of the hose sections 27 and 28 the ball valve 36 is securely held on its seat by air pressure in the compartment 25 and by suction produced thereon by air moving downward through the passageway 32 from the port 40.

By embodying the entire device, except the bell and actuator, in a self-contained unit, the installation of the call device is a relatively simple and easy matter.

From the above description, it is evident that by the novel control of the air pressure in the compartment 25 and the novel construction of the switch 14, air pressure built up in said compartment will hold the switch closed and thereby cause the bell 13 to ring for a considerable time after the tire or tires of a vehicle have passed over one of the hose sections 27 and 28.

Without these novel features the bell 13 would give only a short ring or jingle.

If desired the abutment may be dispensed with and instead of the device giving two relatively short calls or signal, a long one will be given.

It will be understood that the invention described is capable of various modifications within the scope of the invention herein disclosed and claimed.

What we claim is:

1. In a device of the kind described, a casing, a diaphragm dividing the casing into a switch compartment and an air compartment, an electric circuit a normally open switch in the switch compartment, said switch comprising a pair of leaf spring contacts one of which is relatively movable and arranged to be engaged by the diaphragm, means for adjusting the other contact relative to the movable contact to vary the normal gap there-between, means including a conduit for intermittently forcing air into the air compartment, a check valve in the air conduit arranged to be opened by air being forced through the conduit to the air compartment and be closed by air pressure in the air compartment, a second check valve in the conduit outward of the first noted check valve and arranged to be held closed by air pressure in said conduit, and arranged to open when air pressure in the air conduit is below atmospheric pressure, an air release valve leading from the air compartment and arranged to open when air pressure in the air compartment goes above a predetermined pressure, and an air escape vent leading from the air compartment, and having an air conducting capacity that is less than the air intake from the conduit.

2. In a device of the class described, a casing, a diaphragm dividing the casing into a switch compartment and an air compartment, in an electric circuit a normally open switch constructed and arranged to be closed by the diaphragm, an air conduit having communication with the air compartment, means for forcing air through said conduit to produce an impulse in the air compartment for actuating the diaphragm to close the switch, a check valve in the conduit arranged to be opened by air passing through the air conduit to the air compartment, and when closed, preventing the escape of air from the air compartment to the conduit, an open air escape vent leading from the air compartment to atmosphere, the air-conducting capacity of the vent being less than the air-conducting capacity of the air conduit, and an air release valve leading from the air compartment and arranged to open when air pressure in said compartment goes above a predetermined pressure.

3. The structure defined in claim 2 which further includes a second check valve outwardly of the first noted check valve and normally closed by air pressure in the conduit and arranged to open when air pressure in the air conduit drops below atmospheric pressure.

4. In a device of the class described, a diaphragm dividing the casing into a switch compartment and an air compartment, in an electric circuit a normally open switch in the switch compartment, said switch comprising a relatively

fixed contact and a co-operating relatively movable contact, said movable contact being a leaf spring anchored at one end and with its free end portion arranged to engage the fixed contact by springing the movable contact toward the fixed contact, an air conduit having communication with the air compartment, means for forcing air through said compartment to produce an impulse in the air compartment for actuating the diaphragm, said movable contact being arranged to be engaged by the actuated diaphragm and said movable contact pressed thereby into engagement with the fixed contact, said switch compartment being open to the atmosphere, an air escape vent leading from the air compartment to the atmosphere, the air-conducting capacity of the vent being less than that of the air intake from the air conduit, and an abutment between the two contacts and arranged to be engaged by the movable contact after said movable contact has been moved into engagement with the fixed contact by the actuated diaphragm during its initial movement and spring the movable contact out of engagement with the fixed contact during final movement of the movable contact toward the fixed contact by the actuated diaphragm, said diaphragm during its initial receding movement allowing the movable contact to re-engage the fixed contact and during its final receding movement, allowing the movable contact to again move out of engagement with the fixed contact.

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