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CIRCUIT CONTROLLER

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Fig. 1.

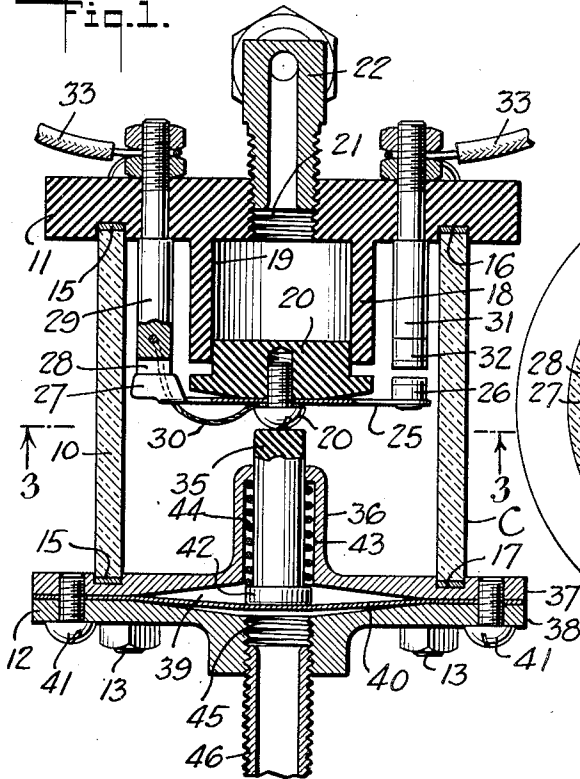


Fig. 3.

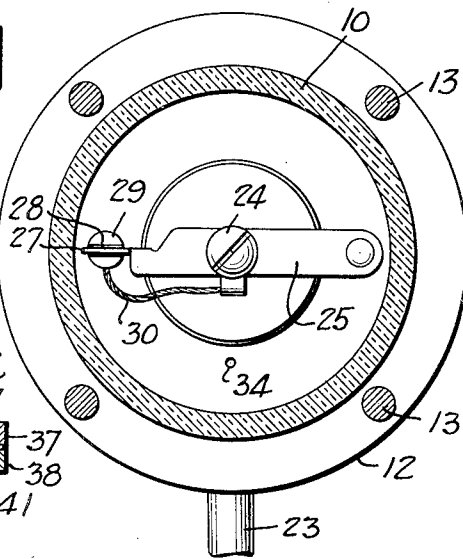


Fig. 2.

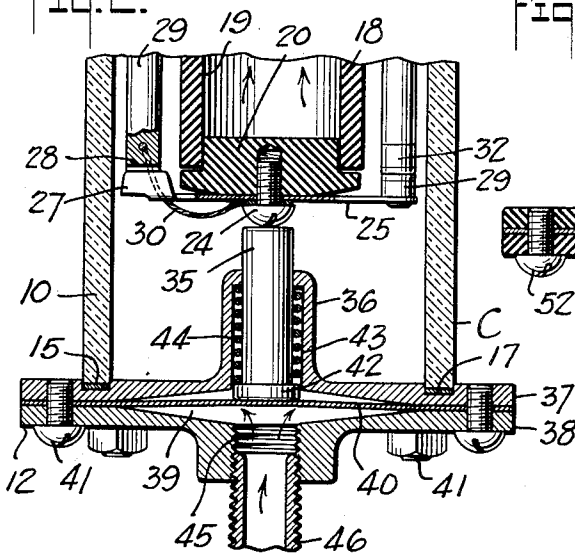
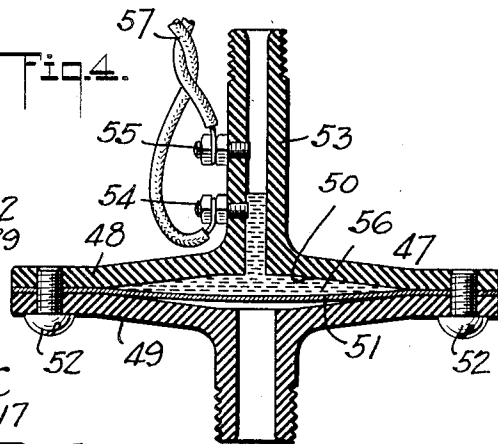


Fig. 4.



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CIRCUIT CONTROLLER

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1 Claim. (Cl. 200-83)

This invention relates generally to electrical systems and more particularly to circuit controllers as employed therein for the control of current flow in the system.

5 An object of the invention is to provide a circuit controller particularly adapted, although not necessarily, for use in the ignition circuit of the motor of an automobile, to automatically disrupt the circuit when operation of the motor ceases, so that should the operator fail to open the usual ignition switch when stalling the motor or parking the automobile, the unnecessary draining of current from the storage battery will positively be prevented.

15 Another object of the invention is to provide a circuit controller of the above described character which is maintained closed under the influence of suction induced by the motor when in operation, and by the pressure of the oil in the force feed lubricating system of the motor so as to reinforce the action of the suction at times when negligible suction is being developed by the motor, all in such manner as to positively insure that the ignition circuit will be maintained closed so long as the motor is in operation, yet will instantly be disrupted should operation of the motor cease.

25 With these and other objects in view, the invention consists of the following combinations, arrangements and functional relationships of elements as set forth in the following specification and particularly pointed out in the appended claim.

In the accompanying drawing:

35 Figure 1 is a view showing in vertical central section one form of circuit controller embodying this invention, in open circuit position;

Figure 2 is a fragmentary view similar to Figure 1, and showing the circuit controller in closed circuit position;

40 Figure 3 is a horizontal sectional view taken on the line 3-3 of Figure 1;

Figure 4 is a vertical central sectional view of a modified form of circuit controller in closed circuit position.

45 Referring specifically to the drawing, and particularly to Figures 1, 2 and 3, the invention in its present embodiment comprises a casing C composed of a cylindrical open ended shell 10 of glass or other suitable transparent and insulating material, the ends of which are closed by heads 11 and 12 which coact to clamp the shell therebetween through the medium of tie bolts 13. Ring gaskets 15 seat in annular grooves 16 and 55 17 in the respective heads, which grooves also

receive the ends of the shell to confine the latter against lateral displacement.

In the present instance, the head 11 is constructed of hard rubber or other suitable insulating material and is provided on its inner side with a tubular extension 18 which projects axially into the casing C. The extension 18 constitutes a cylinder 19 into the inner open end of which is freely fitted a piston 20 of hard rubber or other suitable material. Formed in the head 11 in communication with the outer end of the cylinder 19 is an induction port 21 which, through the medium of a suitable elbow fitting 22 and pipe 23, is adapted to be placed in communication with the intake manifold of a motor (not shown) so that when the motor is in operation suction will be induced in the cylinder 19 to draw the piston 20 from the position shown in Figure 1 to that shown in Figure 2.

20 Secured intermediate its ends by a screw 24 to the piston 20 is a contact member 25 of flat spring metal, one end of which is provided with a contact point 26, and the other end of which is bent laterally to provide a tongue 27. The tongue 27 extends freely into a bifurcation 28 formed at the inner end of a binding post 29 projecting through and supported by the head 11. A flexible conductor 30 is clamped at one end to the contact member 25 by the screw 24 and is soldered at its other end to the binding post 29 so as to provide a positive electrical connection between the latter and contact member, yet permit the member and piston to move unitarily as aforesaid.

35 A second binding post 31 extends through and is supported by the head 11 in the same manner as the binding post 29 at a location diametrically opposed to the latter, and is provided with a contact point 32 aligned with the contact point 26 and spaced from the latter when the piston and contact member gravitate to the position shown in Figure 1, in the absence of suction in the cylinder 19, whereby to create an open circuit condition between the contacts and binding posts. In practice, a feed wire 33 of the ignition circuit of a motor is parted at a convenient location, and its ends secured to the binding posts as shown in Figure 1 so that when the contact points are open, the ignition circuit will be disrupted independently of the usual ignition switch (not shown). In order to prevent pressure or vacuum being created in the casing and offering resistance to the free movement of the piston, a vent port 34 (Figure 3) is provided in the head 11. It will be manifest that the tongue 27 of the contact member 25 coacts with the binding post 29 to 55

prevent rotation of the piston and thus insure alinement of the contact points 26 and 32 at all times while leaving the piston free for movement.

5 In the open position of the circuit controller shown in Figure 1, the head of the screw 24 rests upon an actuator in the form of a pin 33 of hard rubber or other suitable insulating material. The pin 33 is reciprocally mounted in a guide sleeve 36 projecting axially from the section 37 10 of the two section head 12 into the casing C. The other section 38 of the head 12 coacts with the section 37 to define a chamber 39 in which works a diaphragm 40 clamped between the sections 15 of the head by screws 41, which also secure the sections together. The inner end of the pin 33 is provided with a head 42 slidably fitting the bore 43 of the sleeve 36, and the pin is normally urged by a spring 44 to engage and flex the diaphragm 20 40 to the position shown in Figure 1. The chamber 39 at the other side of the diaphragm is provided with a pressure port 45, which, through the medium of a pipe 36, is adapted to be placed in communication with the pressure side of the pipe 25 line leading from the usual oil pump of the motor (not shown), for constantly circulating oil under pressure to the working parts of the motor during operation of the latter. Thus the pressure of the oil will be imposed on the diaphragm to flex the 30 latter to the position shown in Figure 2 so that the pin 33 will be raised to function in moving the contact member 25 to and maintaining it in the circuit closing position shown in this figure. 35 The oil pressure is thus utilized to supplement the motor suction in maintaining the ignition circuit closed at times when the suction may be inadequate to act upon the piston 20 with sufficient force and effect to insure engagement of the contacts. It will be clear that when operation of 40 the motor ceases with the consequent relief of oil pressure upon the diaphragm as well as the absence of suction, that the spring 44 will restore the pin 33 and the diaphragm 40 to the position 45 shown in Figure 1, thus permitting the piston and contact member to gravitate to the circuit opening position shown in Figure 1.

Reference will now be had to Figure 4, wherein is shown a head 47 composed of two disk sections

48 and 49 of insulating material, such as rubber, coacting to define a chamber 50 spanned by a diaphragm 51 clamped by screws 52 which secure the sections together. The section 48 is provided axially with a vertical inlet tube 53 communicat- 5 ing with the chamber 50 above the diaphragm and supporting a pair of contacts 54 and 55 spaced one above the other. The inlet tube 53 is adapted to be connected to the intake manifold of a motor, whereas an inlet collar projecting 10 from the section 49 in communication with the chamber 50 beneath the diaphragm is adapted to be connected to the feed line from the pressure side of the oil pump of the motor. The portions of the chamber above the diaphragm and the tube 15 53 up to the level of the lower contact 54 are filled with a body of mercury 56 or other fluid conducting substance. The usual ignition circuit of which the wire 57 connected to the contacts 54 and 55 forms a part, is normally disrupted by the 20 spaced contacts. However, when the motor is in operation and suction is thus induced in the tube 53, the mercury will be sucked up into the tube a sufficient distance to bridge the contacts 54 and 55 and thereby maintain the ignition circuit 25 complete at this point. The oil pressure imposed upon the diaphragm 51 will insure that the level of the mercury column in the tube 53 will be maintained should the suction at any time during operation of the motor be inadequate for this 30 purpose.

I claim:

A circuit controller for motor ignition systems comprising a pair of relatively movable contacts 35 normally urged to disengage each other; a cylinder adapted for connection to the intake manifold of a motor; a piston secured to the movable contact and movable in the cylinder under the action of suction to engage the contacts; means 40 defining a chamber having a diaphragm therein adapted to be subjected to pressure in the lubricating system of the motor; and an actuating pin reciprocally mounted co-axially of the piston and interposed between the piston and diaphragm for movement by the latter when pressure is imposed 45 thereupon to maintain the contacts closed; and means for urging the pin in a direction to disengage the contacts.

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