Nov. 21, 1933. W. E. ALBERTSON 1,936,535

SWITCH

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Fig. 1.

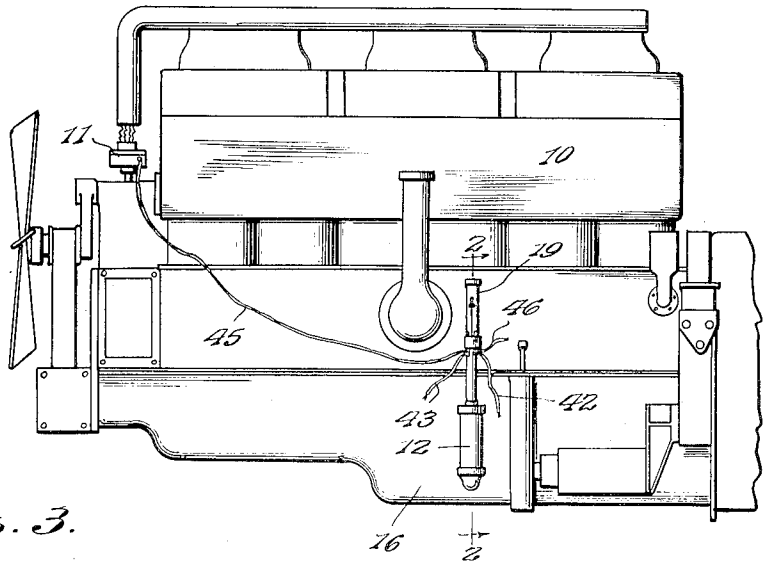


Fig. 3.

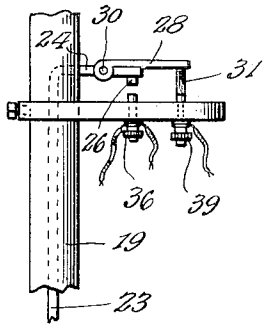


Fig. 4.

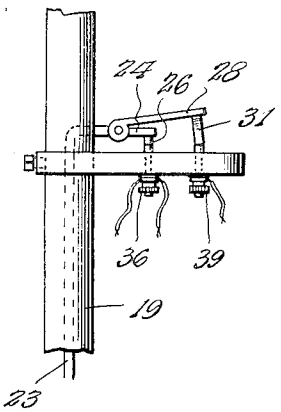
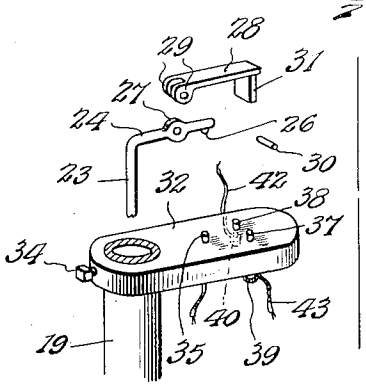


Fig. 5.



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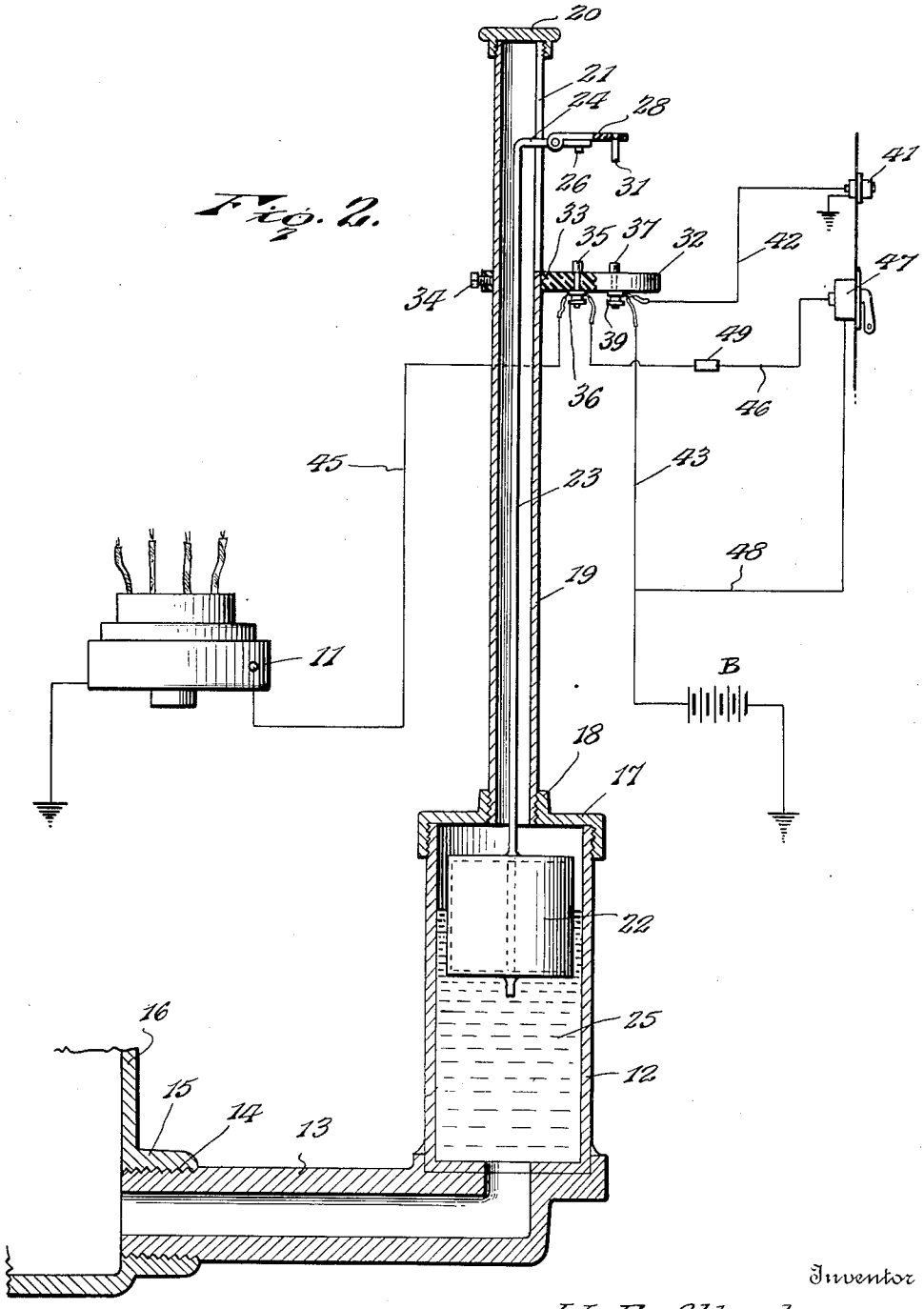
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Fig. 2.



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UNITED STATES PATENT OFFICE

1,936,535

SWITCH

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Application May 7, 1930. Serial No. 450,583

2 Claims. (Cl. 200—16)

This invention relates to oil controlled systems of motor ignition and has for an object to provide means whereby the ignition circuit will be automatically opened in the event the oil becomes so low as to endanger the bearings, cylinder walls and other parts from improper lubrication.

A further object of the invention is to provide a novel float controlled switch which will operate to promptly cut off the ignition should a dangerous drop in oil level occur.

A still further object is to provide a novel float controlled alarm system which will operate a signal light or other alarm device prior to the ignition being cut off so that the operator will have sufficient warning to replenish the oil supply before the ignition is automatically cut off.

A still further object is to provide an extremely simple and durable float controlled switch which will be inexpensive to construct and will be formed of a few strong and durable parts which will not easily get out of order.

With the above and other objects in view the invention consists in certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming part of this specification,

Figure 1 is a side elevation of an internal combustion motor showing my improved float controlled switch applied thereto,

Fig. 2 is a longitudinal sectional view on the line 2—2 of Figure 1,

Fig. 3 is a fragmentary side elevation showing the switch parts in position to close the alarm circuit,

Fig. 4 is a fragmentary side elevation showing the switch parts in position to cut off the ignition,

Fig. 5 is a detail perspective view showing the switch parts disassembled.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, 10 designates an internal combustion motor and 11 designates the distributor of the ignition system thereof. It is to be understood, however, that my improved float controlled switch is also applicable to magneto systems of motor ignition as well as distributor and coil systems.

In carrying out my invention I provide a cylindrical float chamber 12 which is equipped at the bottom with a pipe 13 having exterior screw threads 14 adapted to engage in a threaded nipple 15 which communicates with the oil reservoir of the crank case 16. It will be understood that the crank case is equipped with the usual baffles to prevent surging of the oil.

The top of the float chamber 12 is closed by a cap 17 having an interiorly threaded nipple 18. The stand pipe 19 is threaded into the nipple 18, said stand pipe being closed at the top by a cap 20. The stand pipe is provided in the side below the cap with a longitudinal guide slot 21.

Mounted in the float chamber is a float 22 which preferably consists of a hollow cylindrical metal body, the same being provided with an upstanding stem 23 which is disposed axially in the pipe 19. The stem is provided with a lateral arm 24 which extends outwardly through the guide slot 21 in said pipe. The walls of the slot, in addition to directing the sliding movement of the arm, also ground the arm through the metal pipes 19 and 13, metal float chamber 12, and crank case 16 of the motor, to the chassis, which latter is the usual common ground for all the electric circuits of an automobile. Obviously, as the float rises and falls due to changes in level of the oil 25 in the float chamber, the arm 24 will correspondingly move in a vertical path in the slot 21. The arm 24 is terminally provided on the underneath face thereof with an integral projection 26 which forms a switch contact.

The arm 24 is provided intermediate the ends thereof with a hinge eye 27. A bar 28 of insulating material is provided at one end with eyes 29 through which and the eye 27 a pintle 30 is passed. The eyes 29 are offset from the bar 28 so that the latter extends normally in horizontal position along the top edge of the arm 24 and extends considerably therebeyond. The bar is terminally equipped on the underneath face with a metal projection 31 which is of sufficient length to extend considerably below the contact 26, as shown in Figure 2.

Adjustably mounted on the pipe 19 at substantially the bottom edge of the slot 21 therein, there is a plate 32, which underlies and is disposed substantially parallel with the arm 24 of the float stem. The plate is provided with an opening 33 therein to receive the pipe 19 and is also provided with a set screw 34 adapted to adjustably secure the plate at any desired height on the pipe 19.

The plate is formed of insulating material, such as hard rubber, bakelite or the like.

A metal contact 35 is disposed in a suitable opening in the insulating plate and is equipped with a nut 36 for attaching circuit wires, as will presently be explained. A pair of spaced metal contacts 37 and 38 are also disposed in suitable openings in the insulating plate, as best shown in Figure 5, and are equipped with corresponding nuts 39 and 40 to receive circuit wires, as also will be presently explained. The contact 35 underlies the contact 26 on the float stem arm 24 while the contacts 37 and 38 underlie the contact 31 on the insulated bar 28.

An alarm lamp 41 or other electrical alarm is preferably fixed on the instrument board of the automobile and is connected by a wire 42 to the contact 38. A conductor wire 43 is connected to the contact 37 and is connected preferably to a storage battery, indicated by the letter B. Obviously, when the float 22 gravitates due to low oil level the stem 23 will move in a downward path and engage the metal contact 31 with both of the contacts 37 and 38, thereby closing the circuit from the alarm lamp 41 to the storage battery. The alarm lamp will give timely warning to the operator that the oil level is dangerously low.

By now referring again to Figure 2, it will be seen that the contact 35 is connected by a conductor wire 45 to the distributor 11 and is also connected by a conductor wire 46 to the ignition switch 47 on the instrument board. The conductor wire 48 connects the switch with the storage battery. There is also a fuse 49 disposed in series with the wire 46. Obviously, as the arm 24 moves downward in unison with gravitation of the float as the oil level becomes sufficiently low to provide inadequate lubrication, the contact 26 will engage the contact 35 whereby the circuit from the battery through the switch and fuse will be grounded through the contacts 35, 26, stem arm 24 and stand pipe 19 with the result that the fuse 49 is blown and the ignition circuit thereby cut off. Blowing of the fuse prevents discharge of the battery.

By virtue of the contact 31 being of greater length than the contact 26, the contact 31 will be timed to bridge the contacts 37 and 38 in advance of the contact 26 engaging the contact 35 to cut off the ignition. In practice the interval of time elapsing between energizing of the alarm lamp and cutting off of the ignition is sufficient to enable the operator to replenish the oil supply before the ignition is automatically cut off.

By now referring to Figures 3 and 4, it will be observed that after the alarm lamp has been energized by closing of the alarm circuit at the contacts 31, 37, and 38, the bar 28 will be rocked upward on the hinge pintle 30 as the float continues to gravitate and permit of the alarm circuit being maintained closed to continuously light the alarm lamp. Obviously, should the oil supply be replenished before the float has dropped sufficiently to cut off the ignition as above described, the float will be moved upwardly as the oil level rises and cause the float stem to move upwardly and disengage the contact 31 from the contacts 37 and 38, thereby breaking the alarm circuit and extinguishing the alarm lamp.

Although an alarm lamp has been illustrated, it is not intended to limit the invention to the employment of a lamp since a buzzer or other electrical alarm may be substituted therefor.

Having thus described the invention, I claim:

1. A switch comprising a movable member having a terminal contact, a relatively stationary member coacting therewith and formed of insulating material, an arm of insulating material pivotally mounted on the movable member and normally resting in a horizontal plane thereon and projecting longitudinally beyond one end thereof, a pair of contacts carried by the stationary member, a single contact on the stationary member at the rear of said pair of contacts and adapted to engage the terminal contact of the movable member and close a circuit, and a contact depending from the insulating arm and of greater length than the terminal contact of the movable member and adapted to bridge said pair of contacts and close a circuit in advance of the closing of the first mentioned circuit.

2. A switch comprising a movable member having a terminal depending contact, a stationary member of greater length than the movable member coacting therewith and formed of insulating material, an arm of insulating material pivotally mounted on the intermediate portion of the movable member and normally resting in a horizontal plane thereon and projecting longitudinally beyond one end thereof, said arm being free to move in an upward direction only, a pair of contacts carried by the stationary member, a single contact on the stationary member at the rear of said pair of contacts and adapted to engage the terminal contact of the movable member and close a circuit, and a contact member depending from the projecting end of the insulating arm and of greater length than the terminal contact of the movable member and adapted to bridge said pair of contacts and close a circuit in advance of the closing of the first mentioned circuit.

WILLIAM E. ALBERTSON. [L. S.]