May 22, 1928. 1,671,009

J. L. BODY

PUMP

Filed Aug. 27, 1926 3 Sheets-Sheet 1

Fig. 1.

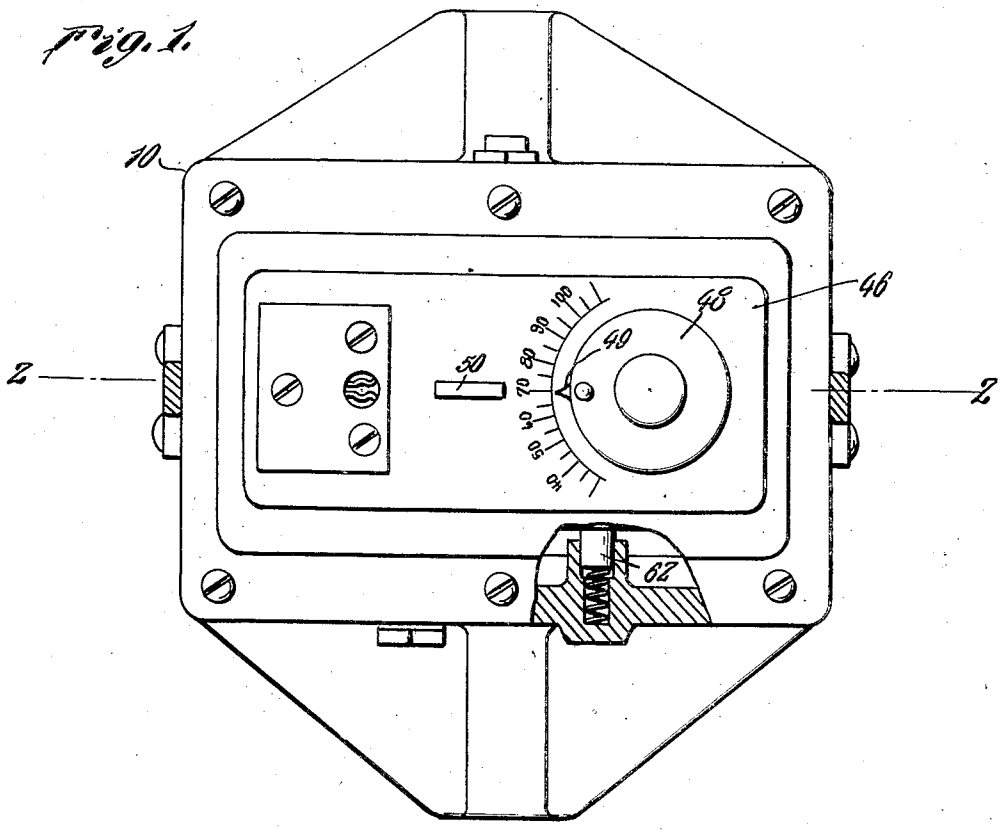
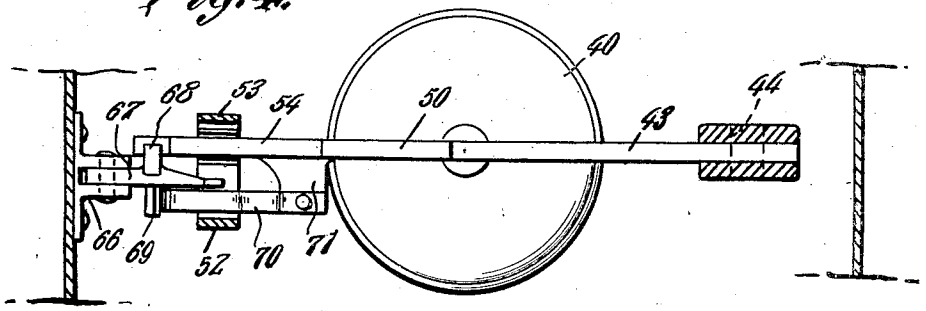


Fig. 4.



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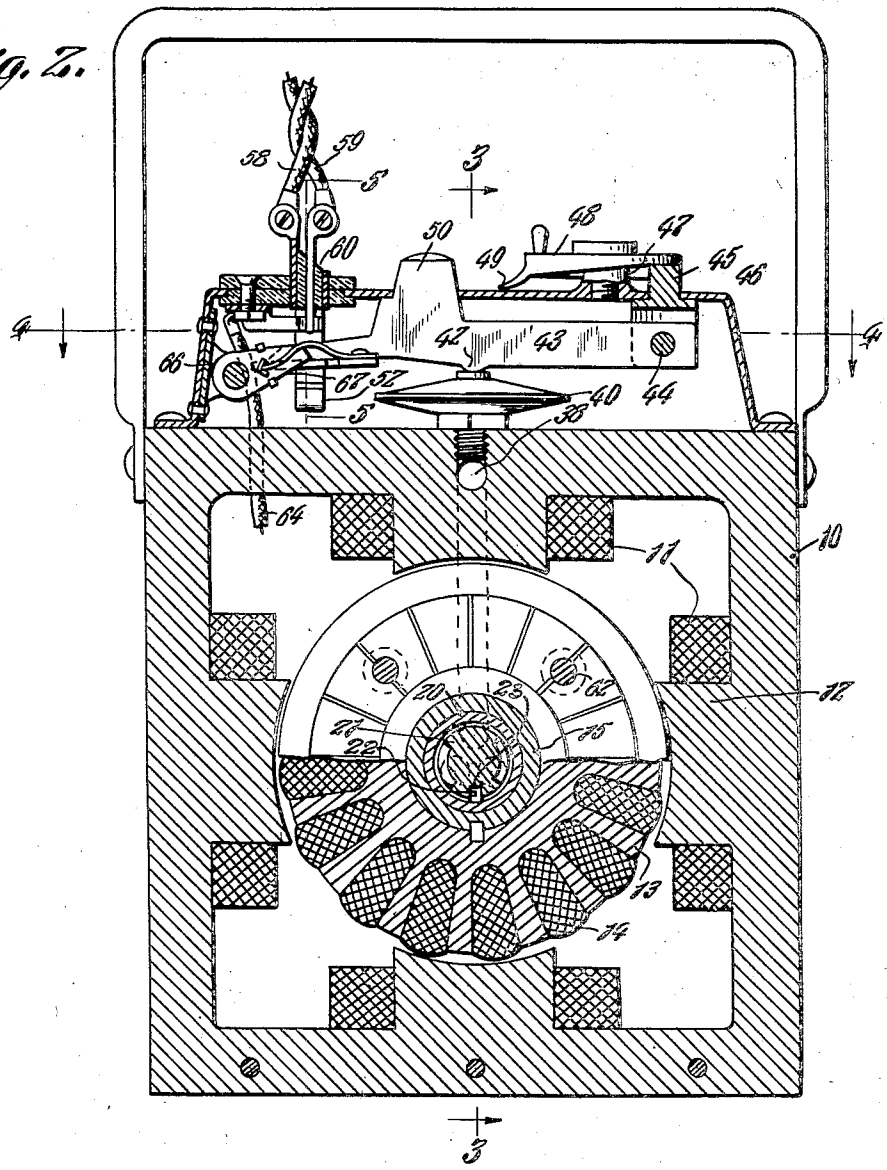
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Fig. 2.



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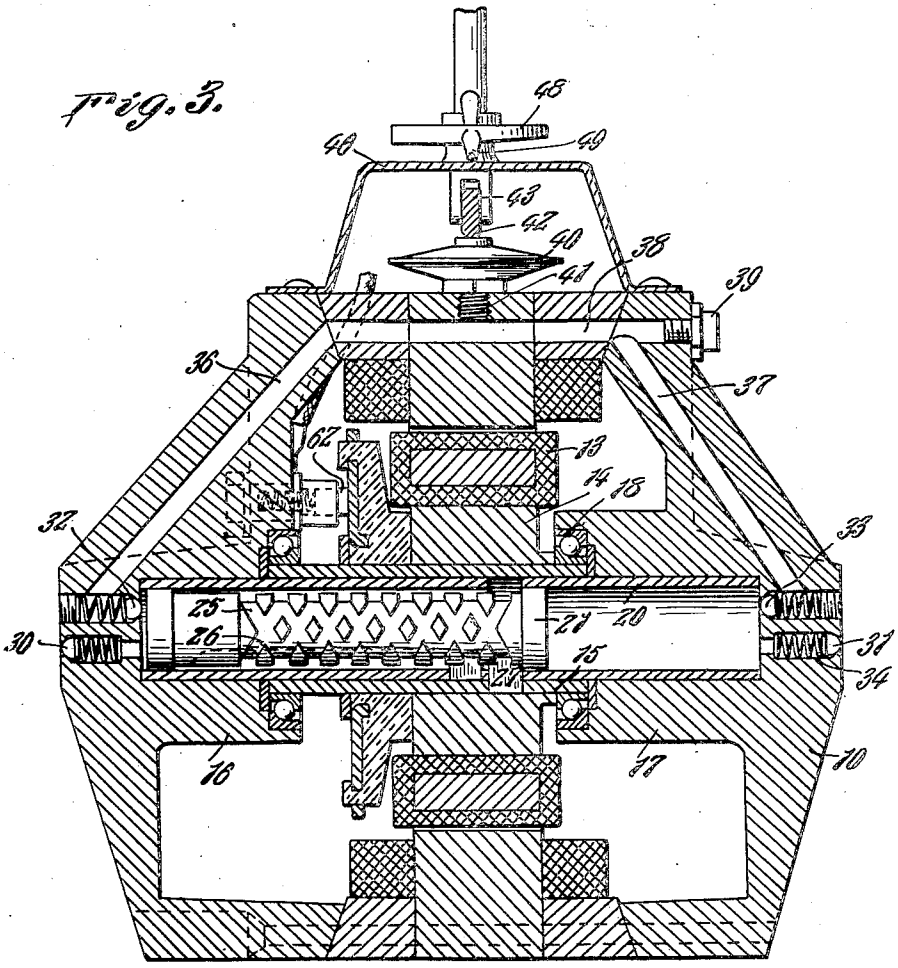
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J. L. BODY

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Fig. 3.



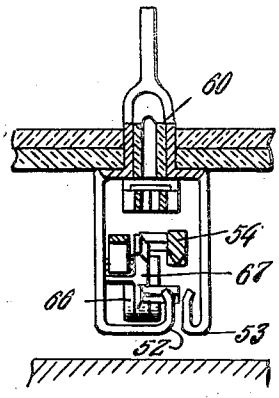


Fig. 5.

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Patented May 22, 1928. 1,671,009

UNITED STATES PATENT OFFICE.

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PUMP.

Application filed August 27, 1926. Serial No. 132,004.

The object of this invention is to provide a pump including a cylinder extending thru the armature of a motor, and a piston adapted for movement in the cylinder, incident to the rotation of the armature, with special means acting under predetermined air pressure to open the circuit of the motor.

A further object is to provide a controlling device including an expansible element, a pivoted arm controlled by the expansible element and adapted to be positioned in accordance with the position of a pointer on a dial indicating the tire pressure desired,—with special means for throwing out the switch of the motor when the tire pressure corresponds with the setting of the pointer on the dial.

A further object is to provide a pump especially adapted for use in inflating automobile tires.

With the foregoing and other objects in view, the invention consists in the novel construction and arrangement of elements described, illustrated and claimed, it being understood that modifications may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings forming part of this application,

Figure 1 is a plan view, showing the housing, the dial thereon, and means permitting the connection of the motor of Figures 2 and 3 with feed wires.

Figure 2 is a view in vertical section, the section being on line 2—2 of Figure 1.

Figure 3 is a vertical section, on line 3—3 of Figure 2.

Figure 4 is a horizontal section on line 4—4 of Figure 2.

Figure 5 is a detail view, constituting a section on line 5—5 of Figure 2.

Mounted within the structure 10 are field coils 11 surrounding cores 12 formed with the walls of structure 10, the field thus provided being suitably energized. The armature is designated 13 and includes the coils 14.

Rotating with the body of the armature is a sleeve 15, and anti-friction bearings are shown as being located between the sleeve and the portions 16 and 17 of the external structure, the bearings being designated 18.

Within sleeve 15 is a cylinder 20, and a piston 21 is adapted to reciprocate within the cylinder, a key 22 cooperating with key way 23 permitting such longitudinal movement of the piston.

Piston 21 is elongated, and is provided with two annular end portions, and the body of the piston is provided with spirals 25 and 26 extending in opposite directions, a dog 27 being adapted for cooperation with these spiral channels,—it being the intention that the piston shall travel in one direction and shall then reverse, for producing the reciprocating movement referred to. Air is admitted at opposite ends of the cylinder 20 thru ports controlled by spring held valves 30 and 31, and air under pressure passes outwardly from the ends of the cylinder 20 thru ports controlled by valves 32 and 33. The springs for the several valves just referred to are designated 34.

Air placed under pressure by the plunger 21, and passing around valves 32 and 33, passes thence to channels 36 and 37 communicating with channel 38, from which air flows to the tire, or is otherwise made use of. A connection 39 is in communication with channel 38.

The pressure in channel 38 and in the tire affects an expansible element 40 shown as having connection at 41 with said channel 38. This expansible element 40 acts thru pin 42 on an arm 43 pivoted at 44 on the lower part of a pin 45 which is movable thru an aperture in element 46 carried by housing 10. The vertical position of pin 45 is determined by a cam 47 acting upon cam element 48 mounting a pointer 49, the element 48 being engaged by pin 45.

Arm 43, controlled in part automatically by the expansible element 40, may also be manually controlled by the pressure of the hand or thumb on the element 50.

Arm 43 acting as a switch blade cooperates with the contact elements 52 and 53, and is movable between these elements 52 and 53 when pressure is applied at 50, this operation completing a circuit for starting the motor. In this connection, it may be stated that a motor of a different type may be employed, if desired, but I have illustrated a form well adapted to serve the purpose. When pressure in the tire and in channel 38 rises to a specified point, the expansible element 40 will raise switch arm 43 and will separate the portion 54 of the switch arm

from the elements 52 and 53, as will be apparent from an inspection of Figures 2 and 5.

Feed wires 58 and 59 are connected with separate terminals of a plug 60, one of these terminals being grounded, and one of the terminals of the motor being grounded as shown at 62 in Figures 1 and 3. The other terminal of the plug 60 is connected with wire 64, leading to the other brush 65 of the motor as in Figure 2.

Opposite the end portion 54 of the switch arm, reference being made to Figure 4, in connection with Figures 2 and 5, or approximately in that position is a stationary bracket 66 mounting the pivoted arm 67 carrying a pin or lug 68 adapted to be engaged by the switch blade 54, and arm 67 carries an extension 69 having a depression formed therein for engagement by the end of a spring 70 mounted on an extension 71 projecting from the side of the switch blade.

The elements just referred to having the relative proportions and position indicated in Figure 2, the movement of arm 67 and the adjacent end of the switch blade will be accelerated, after element 67 passes a dead or neutral point. The same quick movement will take place when the switch blade is making contact with elements 52 and 53 and when the circuit is broken at this point.

The pointer 49 is set at the desired point on a scale indicated by graduations in Figure 1, and the position of the pointer determines the time of operation of the switch releasing devices, so that the circuit will be maintained until the air pressure rises to the point indicated by the arm or pointer 49.

Movement of the pointer 49 in one direction, when setting the device manually for a given pressure, will produce mechanical pressure between cam disk 48 and pin 45, tending to raise the left end 54 of lever 43, slightly, so that it will disengage contacts 52, 53 (under the action of expansible element 40) sooner than when said pointer is shifted in the opposite direction in order to provide for increased air pressure in the tire, by keeping the motor in operation longer.

Having described the invention, what is claimed is:—

1. In a device of the class described, a motor including an armature, a cylinder extending thru the armature, a piston within the cylinder, means for reciprocating the piston incident to the rotation of the armature, for placing air under pressure, an expansible element into which a portion of the compressed air passes, and a switch controlled by the expansible element, said switch being adapted for connection with the motor circuit.

2. In a device of the class described, a motor including an armature, a cylinder extending thru the armature, a piston within the cylinder, means for reciprocating the piston and automatically reversing its direction of movement incident to the rotation of the armature, for placing air under pressure, an expansible element into which a portion of the compressed air passes, and a switch controlled by the expansible element, said switch being adapted for connection with the motor circuit.

3. In a device of the class described, a motor including an armature, a cylinder extending thru the armature, a piston within the cylinder, means for reciprocating the piston incident to the rotation of the armature, for placing air under pressure, an expansible element into which a portion of the compressed air passes, and a switch controlled automatically by the expansible element, said switch being adapted for connection with the motor circuit.

4. In a device of the class described, a motor including an armature, a cylinder extending thru the armature, a piston within the cylinder, means for reciprocating the piston incident to the rotation of the armature, for placing air under pressure, an expansible element into which a portion of the compressed air passes, and a switch controlled by the expansible element, said switch being adapted for connection with the motor circuit, and means manually controlled, and including a pointer cooperating with a dial, for varying the time of effective operation of the expansible element with reference to the switch.

5. In a device of the class described, a motor including an armature, a cylinder extending thru the armature, a piston within the cylinder, means for reciprocating the piston incident to the rotation of the armature, for placing air under pressure, an expansible element into which a portion of the compressed air passes, and a switch controlled by the expansible element, said switch being adapted for connection with the motor circuit, and means manually controlled, and including cam mechanism, for varying the time of effective operation of the expansible element with reference to the switch.

In testimony whereof I affix my signature

JAMES L. BODY.