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J. H. GLENN & M. REULE.

PRESSURE CONTROLLER.

APPLICATION FILED APR. 10, 1907.

Fig. 2.

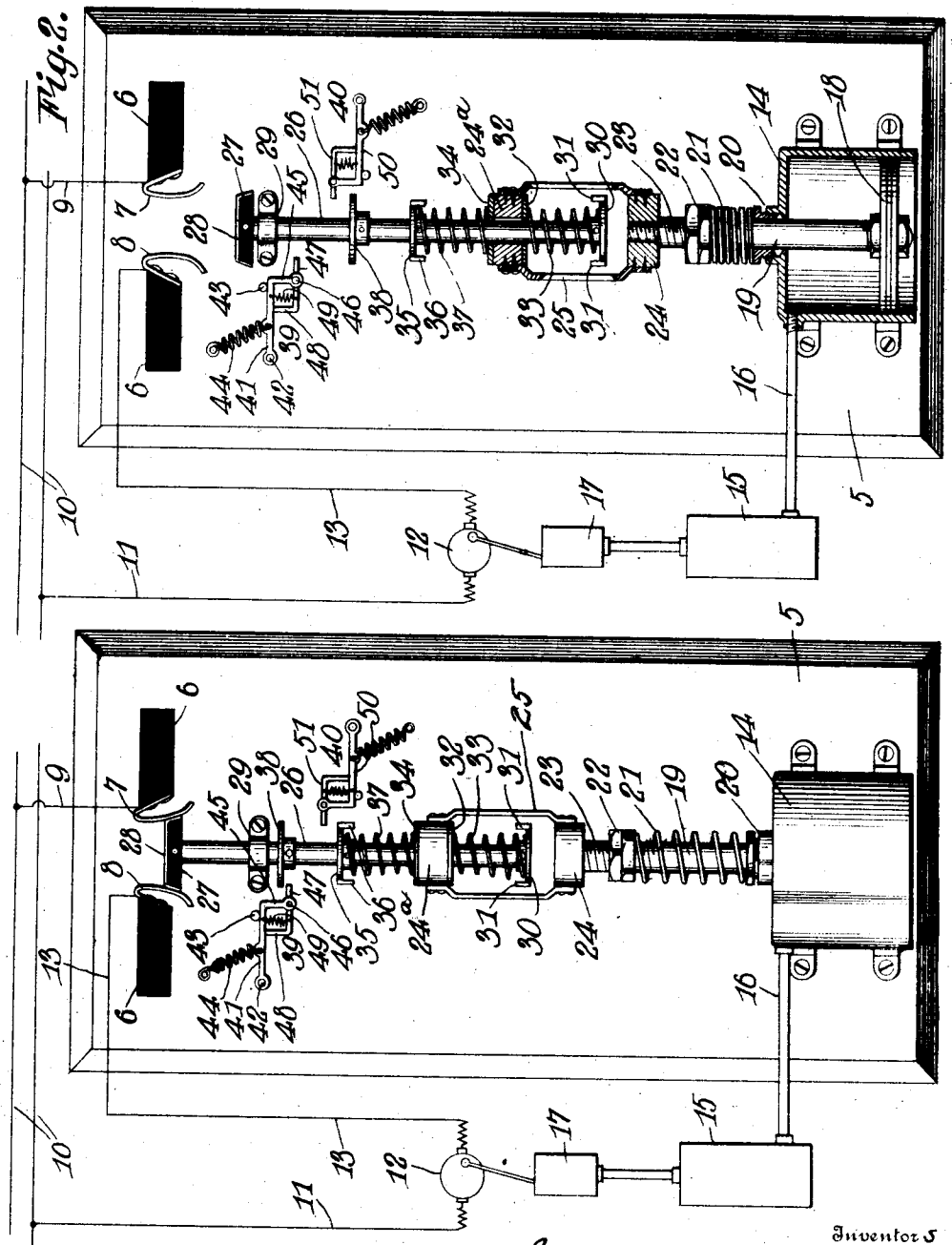


Fig. 1.

Witnesses

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JAMES H. GLENN AND MICHAEL REULE, OF LA FAYETTE, INDIANA.

PRESSURE-CONTROLLER.

No. 866,643. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed April 10, 1907. Serial No. 367,465.

To all whom it may concern:

Be it known that we, JAMES H. GLENN and MICHAEL REULE, citizens of the United States, residing at La Fayette, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Pressure-Controllers, of which the following is a specification.

This invention is a pressure controller for electrically driven air pumps, and more particularly an apparatus for automatically breaking the circuit to throw the motor out of operation when a predetermined receiver pressure has been attained, and to close the circuit to start the motor when the receiver pressure has fallen, to a predetermined limit.

The object of the invention is to provide a controller embodying simplicity of construction, and one which is very sensitive to varying pressures and reliable in operation, and also to prevent the formation of an arc at the contacts.

In the accompanying drawing, Figure 1 is a plan view of the apparatus showing the position of the parts when the circuit is closed. Fig. 2 is a plan view partly in section showing the circuit opened.

Referring specifically to the drawing, 5 denotes a base on which the apparatus is mounted. To the base are secured spaced insulating blocks 6 having spring contacts 7 and 8, respectively. The contact 7 is connected by a wire 9 to one of the mains 10. The other main is connected by a wire 11 to one of the brushes of the motor 12. The other brush of the motor is connected by a wire 13 to the contact 8. By this arrangement the motor circuit will be closed when the contacts 7 and 8 are connected, and the circuit will be opened when said contacts are disconnected.

At 14 is indicated a cylinder which is in communication with the receiver or storage reservoir 15 by a pipe 16. The compressor 17 is driven by the motor 12.

In the cylinder is a plunger 18 having a stem 19 which passes through a stuffing-box 20. On the outside of the cylinder a spring 21 is coiled around the stem between the stuffing-box and nuts 22 screwed on a threaded portion 23 of the stem. By means of these nuts the tension of the spring can be regulated to determine the maximum and minimum limits between which the pressure in the receiver is to be maintained. Above the nuts 22 a block 24 is fixed to the end of the stem 19 by screwing it thereon or in any other suitable manner. The block is connected to another block 24^a by a rigid frame 25. The block 24 has an opening through which a stem 26 loosely passes. The end of the stem 26, above the block 24 has a head 27 of insulating material on the top of which is secured a contact plate 28 adapted to close the motor circuit by entering between the spring contacts 7 and 8, and opening said circuit when withdrawn therefrom. The stem works in a guide 29 secured to the base 5.

To the end of the stem 26, below the block 24^a, is fastened a collar 30 having at its edge upstanding lugs 31. Between this collar and a collar 32 which is loose on the rod 26, a spring 33 is coiled around the stem. Above the block 24^a the stem carries a loose collar 34, and above this a fixed collar 35 having depending lugs 36. A spring 37 is coiled around the stem between the collars 34 and 35. Above the last mentioned collar the stem carries a fixed collar 38.

Adjacent the stem 26 on opposite sides thereof are latches 39 and 40, respectively. The latch 39 comprises a lever 41 pivoted at 42 to the base 5 and held against a stop 43 by a spring 44. The free end of the lever is turned down as indicated at 45, and to said end is pivoted at 46 a finger 47, one end of which is bent upwardly as indicated at 48 to engage the lever 41. The finger is held in this position by a spring 49. The latch 40 comprises a spring-actuated lever 50 and finger 51, these parts being arranged in the same manner as the parts comprising the latch 39 except that their position is reversed so that they work oppositely.

The operation of the apparatus is as follows:—In Fig. 1 is shown the position of the parts when the motor circuit is closed. As the cylinder 14 is in communication with the receiver 15 the pressure in the latter will be exerted on the plunger 18. As soon as the pressure exceeds the tension of the spring 21, the plunger will commence to move downwardly in the cylinder, which movement is communicated to the block 24^a by reason of the connection between said block and the plunger-stem 19. The downward movement of the block 24^a by reason of its engagement with the collar 32 32 causes it to compress the spring 33 until the collar engages the lugs 31. As the collar 30 is fast on the stem 26 the latter will now commence to move downwardly with the plunger-stem thus gradually withdrawing the contact 28 from the contacts 7 and 8. The final separation of the contacts is made with a quick jerk so that no arcing can take place. This is accomplished in the following manner: The tension of the springs of the levers 41 and 50 is greater than the springs 37 and 33 but less than the spring 21. When the stem 26 moves downwardly in the manner already described, the collar 38 will engage the finger 47, but as said finger cannot swing downwardly by reason of the engagement of its end 48 with the lever 41, the latter will swing down on its pivot against the tension of its spring by reason of the greater tension of the spring 21. As soon as the collar 38 clears the finger 47, the spring 33 is free to expand and it quickly pulls the stem 26 downwardly thereby separating the contacts and opening the circuit. The collar 38 can pass the finger 51 as it moves downwardly and after the collar passes said finger the latter is returned to its normal position by its spring. The parts now are in the position shown in Fig. 2. When the receiver-pressure drops to the predetermined minimum, the spring 21

moves the stem 19 upwardly and a reversal of the operation just described takes place, the collars 34 and 35 being brought into action to compress the spring 37, and the collar 38 engaging the latch 40 so that at soon as it passes the same the stem is shot upwardly to bring the contact 28 between the contacts 7 and 8 and thus close the circuit.

The apparatus herein described effectively serves the purpose for which it is intended. It is sensitive and reliable in operation and by reason of its simplicity of construction it is not liable to get out of order.

If the apparatus is used in connection with the air-brake system of electric railway cars the wire 9 will be connected to the car circuit and the wire 11 to the ground or return circuit.

We claim:—

1. The combination with the receiver of an electrically-driven compressor, a cylinder in communication with the receiver, a plunger working in the cylinder and spring-actuated to oppose the receiver pressure, and a plunger-stem; of a block carried by the plunger-stem and having an opening, a stem working in said opening and carrying circuit-closing means, a yielding connection between the plunger-stem and the circuit-closing stem at both ends of the aforesaid block, tensioned latches opposing the movement of the circuit-closing stem, the tension of said latches being greater than the yielding connection between the plunger-stem and the circuit-closing stem, and latch engaging means carried by the circuit-closing stem.

2. A pressure controller for electrically driven compressors comprising a receiver, a cylinder in communication with the receiver, a plunger working in the cylinder and spring-actuated to oppose the receiver pressure, a plunger-stem, a block carried by the plunger-stem and having an opening, a stem working in the opening of the aforesaid block and having at one end circuit-closing means, a fixed collar on the circuit-closing stem below the block, a spring between the collar and the block, a fixed collar on the circuit-closing stem above the block, a spring between the last mentioned collar and the block, tensioned latches opposing the movement of the circuit-closing stem, the tension of said latches being greater than the springs on the circuit-closing stem, and latch engaging means carried by said stem.

3. A pressure controller for electrically driven compressors comprising a receiver, a cylinder in communication with the receiver, a plunger working in the cylinder and spring-actuated to oppose the receiver pressure, means for regulating the tension of the plunger-spring, a plunger-stem, a block carried by the plunger-stem and having an opening, a stem working in the opening of the aforesaid block and having at one end circuit-closing means, a fixed collar on the circuit-closing stem below the block, a spring between the collar and the block, a fixed collar on the circuit-closing stem above the block, a spring between the last mentioned collar and the block, tensioned latches opposing the movement of the circuit-closing stem, the tension of said latches being greater than the springs on the circuit-closing stem, and latch engaging means carried by said stem.

In testimony whereof we affix our signature, in presence of two witnesses.

JAMES H. GLENN.
MICHAEL REULE.

Witnesses:
WILLIAM J. BEECHEN,
JAMES GLENN.