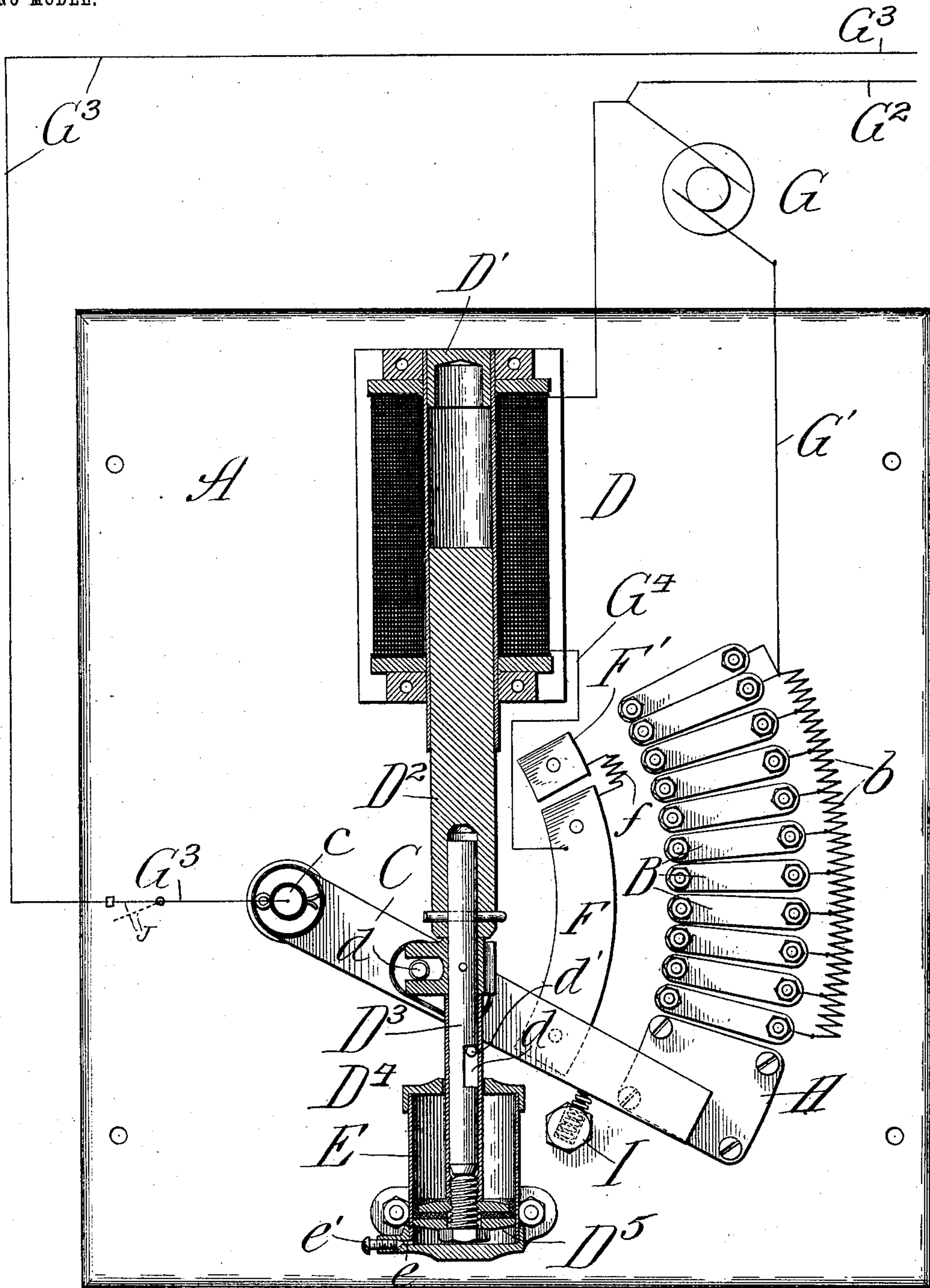


No. 756,534.

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J. L. SCHUREMAN, JR.
CIRCUIT CONTROLLER.
APPLICATION FILED JAN. 11, 1904.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

JACOB L. SCHUREMAN, JR., OF CHICAGO, ILLINOIS.

CIRCUIT-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 756,534, dated April 5, 1904.

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To all whom it may concern:

Be it known that I, JACOB L. SCHUREMAN, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Circuit-Controllers, of which the following is a specification.

My invention relates particularly to electromagnetic controllers for electric circuits such as are employed, for instance, in controlling the circuits of electric motors employed for actuating air-pumps.

My primary object is to provide a circuit-controller or motor-starter wherein provision against sparking at the switch and provision against heating of the switch-controlling magnet-coil are made and wherein desirable uniformity of movement of the switch, after the closing of the circuit, is insured as the switch moves over the contact-points to cut out successive resistance-coils.

The invention is illustrated in the accompanying drawing, in which—

A represents a slab upon which are mounted the parts of the mechanism; B, a series of segmentally-arranged contact-points electrically joined through resistance-coils b ; C, a switch joined by a pivot c to the slab; D, a magnet supplied with a fixed core-section D' at its upper end and a movable core-section D^2 projecting from its lower end; D^3 , a stem secured to the core-section D^2 and having pin-and-slot connection at d with the switch-lever C; D^4 , a tube slidably connected with the lower end of the stem D^3 and equipped with a pin d' , working in a slot d^2 in said stem, the lower end of the tube being equipped with a piston D^5 ; E, a vacuum-cylinder in which the piston works and which is provided at its lower end with an air-inlet e , regulated by a screw e' ; F, a relatively long contact-piece electrically joined by a resistance-coil f to a contact-piece F' , thus forming a rheostat; G, an electric motor; G' , a conductor connecting one brush of the motor with the upper contact-piece of the rheostat B; G^2 , a conductor of the supply-circuit connected with the other brush of the motor and with the spool of the magnet D; G^3 , a conductor of said supply-circuit connected with the pivot of the switch-lever; G^4 ,

a conductor connecting the segment F to the solenoid; H, an insulation-block upon which the free extremity of the switch-lever rests when the controller is not in operation, and I a stop against which the lever bears at such time.

The circuit-wires G^2 G^3 are connected with any suitable electric source, (not shown,) and any suitable switch J is provided for opening and closing the circuit. The switch-lever contacts in the position of rest with both the segment F and the insulation H. When the circuit is completed, as by the closing of a hand-switch, the full current passes through the magnet D, which carries the switch-lever C by a quick movement onto the adjacent contact of the rheostat B, thereby avoiding objectionable sparking at the instant of closing the motor-circuit. The lower end of the slot d now engages the pin d' of the piston-stem D^4 , and the switch-lever continues to move under restraint to gradually cut out the coils of the rheostat, and thereby gradually increase the current passing through the motor. As the switch-lever nears the upper end of its traverse it passes from the contact F to the contact F' , thereby throwing resistance into the magnet-circuit and reducing the current flowing through the magnet. Thus the magnet-coil, which might be dangerously heated by long-continued flow of full current therethrough, is safeguarded by the expedient described.

The construction described is admirably adapted to its purpose, and the vacuum-cylinder and its piston serve in a peculiarly-effective manner to prevent jerking movements of the switch-lever. Moreover, the arrangement of the vacuum-cylinder in alinement with the solenoid aids in securing the desired action upon the switch-lever. However, the details of construction may be varied without departure from my invention. Hence no undue limitation should be understood from the foregoing detailed description.

What I regard as new, and desire to secure by Letters Patent, is—

1. The combination of a motor, a switch-controlling magnet, a rheostat connected with the motor-circuit, a switch coacting there-

with, a switch-restraining device opposing the magnet, and lost-motion connection between the switch and said device, whereby quick movement of the switch at the instant of closing the motor-circuit is effected.

2. The combination of a switch-controlling magnet, a rheostat connected with an electric circuit, a switch coacting therewith and actuated by said magnet, and a switch-restraining device comprising a vacuum-cylinder and a piston therein having lost-motion connection with said switch, for the purpose set forth.

3. The combination of a switch-controlling magnet having a movable core-section, a rheostat connected with an electric circuit, a switch coacting therewith and connected with said core-section, and a switch-restraining device comprising a cylinder and a piston therein having a stem in alinement with said core-section and having lost-motion connection therewith.

4. The combination of a magnet having a movable core-section, a stem connected with one end of said core-section, a pivoted switch connected with said stem, a cylinder beneath the switch, a piston within said cylinder provided with an upwardly-extending stem having lost-motion connection with said first-named stem, and a rheostat connected with an electric circuit and coacting with said switch.

5. The combination of a motor, a switch-controlling magnet, an electric circuit having a conductor connected with said motor and said

magnet and a conductor leading to a switch, a switch connected with said last-named conductor and actuated by said magnet, a rheostat coacting with said switch and connected with said motor, a rheostat coacting with said switch and connected with said magnet, the first-named rheostat operating to cut out resistance and the second-named rheostat operating to cut in resistance during one movement of said switch, and a restraining device for said switch opposing the action of said magnet and having lost-motion connection with the switch, for the purpose set forth.

6. The combination of a motor, an electric circuit having a conductor connected with said motor, a magnet connected with said motor, a switch supported on a pivot connected with another conductor of said electric circuit, a rheostat over which the free end of said switch may be moved and which has its upper end connected with said motor, a second rheostat between said first-named rheostat and the pivot of said switch, a magnet connected with the lower portion of said second-named rheostat and provided with a depending movable core-section connected with said switch, and a restraining device comprising a cylinder and a piston therein having a stem having lost-motion connection with said core-section.

JACOB L. SCHUREMAN, JR.

In presence of—

F. M. WIRTZ,

WALTER N. WINBERG.