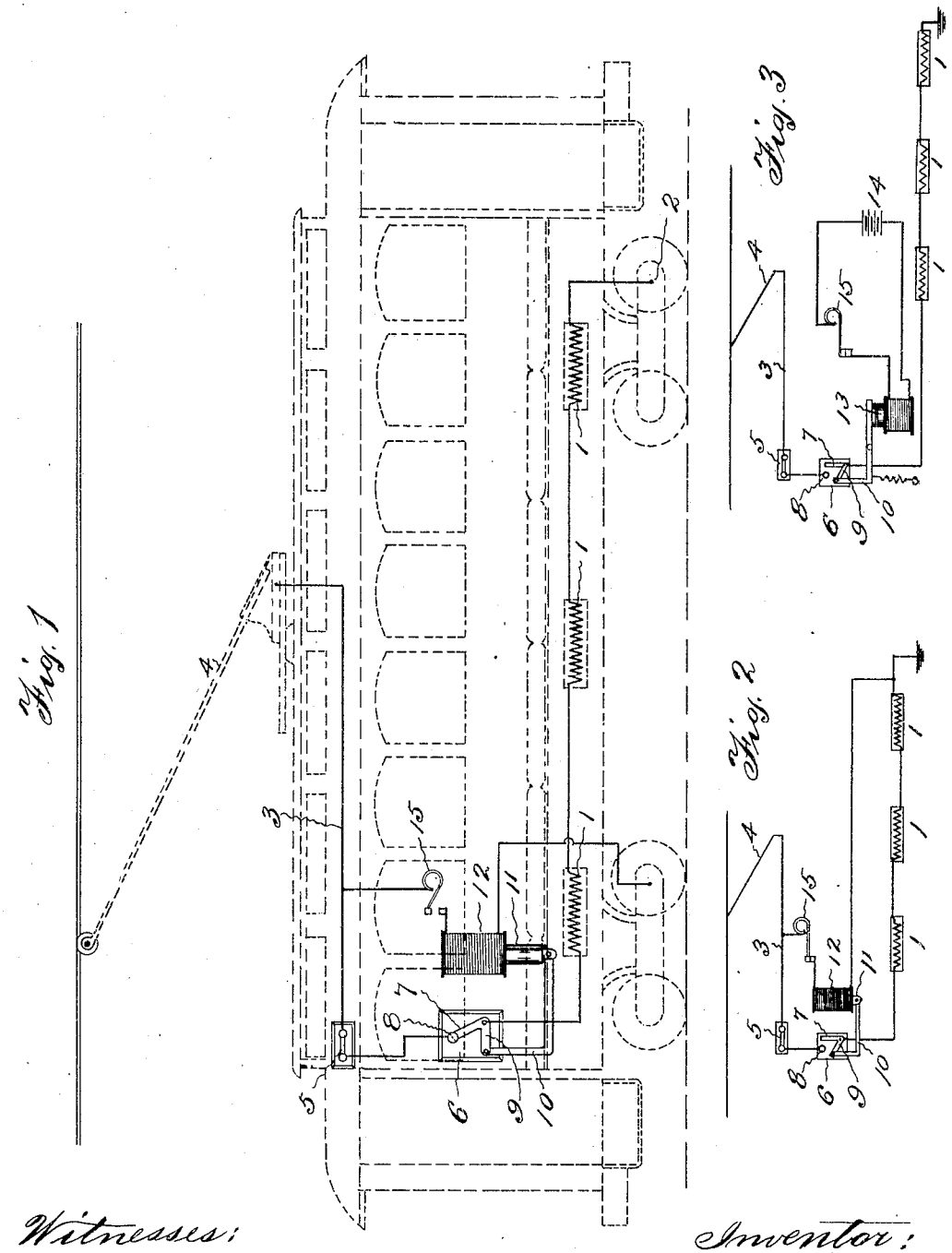
No. 788,166. PATENTED APR. 25, 1905.

A. D. NEWTON.

ELECTRICAL SYSTEM OF HEATING.

APPLICATION FILED JULY 9, 1904.



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UNITED STATES PATENT OFFICE.

ARTHUR D. NEWTON, OF HARTFORD, CONNECTICUT.

ELECTRICAL SYSTEM OF HEATING.

SPECIFICATION forming part of Letters Patent No. 788,166, dated April 25, 1905.

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To all whom it may concern:

Be it known that I, ARTHUR D. NEWTON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Electrical System of Heating, of which the following is a specification.

This invention relates to an automatic system which is particularly designed for heating electric cars.

The object of the invention is to provide a very simple system which can be easily and cheaply installed in cars in use at the present time, as well as in new cars, for automatically keeping the temperature of the car near the desired degree.

In this system are one or more heaters arranged in a circuit between a source of electrical energy and the ground, the said circuit including a switch which is adapted to be opened by magnetic means that is energized by another circuit between a source of electrical energy and the ground, which secondary circuit is controlled by a thermostat.

Figure 1 of the accompanying drawings illustrates an electric-railway car provided with one of these heating systems, the circuits being represented in the conditions assumed when the temperature in the car is below the desired normal and current is passing through the heaters. Fig. 2 shows a diagram of the system represented in Fig. 1 with the circuits in the conditions assumed when the temperature in the car is at or above the desired normal and the heaters are cut out. Fig. 3 shows a diagram of a modified arrangement of the system.

The heaters 1, which may be of any common form and any suitable number, are shown in the illustrations as connected in series in a circuit which has one end connected with the ground through the wheel 2 and the other end connected with the main supply-wire 3, that leads from the trolley-pole 4. An ordinary heater-switch 5 is provided for the motorman to cut in or out this heater-circuit. In this circuit there is an automatic switch 6 of common form. The blade 7 of the switch shown is arranged to swing into and out of engagement with a contact 8, to which one wire of the heater-circuit is connected. The other wire of the heater-circuit is connected with the pivot of the blade. The blade shown has an arm 9, that is connected by a frame 10 with the movable core 11 of a solenoid 12. When current is sent through the coils of the solenoid and the core is drawn upwardly, the frame oscillates the switch-blade out of engagement with the contact and opens the circuit. When no current is passing through the coils of the solenoid, the core and frame drop by gravity and oscillate the blade into engagement with the contact and close the circuit.

Instead of connecting the switch-blade with the core of a solenoid it may be connected with the armature of a field-magnet 13, as shown in Fig. 3. When the magnet is energized and the armature is attracted, the blade opens the heater-circuit, and when the armature is pulled away the blade closes the heater-circuit.

The coils of the solenoid or field-magnet are connected with a circuit which leads from a source of electrical energy to the ground. This source may be the main supply-wire, as shown in Fig. 2, or it may be a battery 14, as shown in Fig. 3. In this magnet-circuit is a thermostat 15 of common form, arranged to keep the magnet-circuit open until the maximum degree of temperature is reached. When the maximum temperature is reached, this thermostat closes the circuit through the coils of the solenoid or other form of electromagnet and causes the core or armature to be drawn in such manner as to open the circuit through the heaters. The thermostat is set so as to close the magnet-circuit at the predetermined maximum degree. Whenever the temperature is below that degree, the magnet-circuit is open, and if the motorman's switch is closed current is passing through the heaters and tending to warm the car. With this system if the motorman's switch is closed whenever the temperature is below the maximum the independent heater-circuit is closed and remains closed until the maximum temperature is reached, and the thermostat closes the magnet-circuit and causes the magnet to throw the switch and open the heater-circuit.

The invention claimed is—

In an electrically-propelled traveling ve-

hicle, in combination, an electrical circuit from a traveling contact to a ground or a return wire, a plural number of heaters disposed about the interior of the vehicle and connected in said circuit, a manually-operative cut-out in said circuit, an automatically-operative switch in said circuit, an electrical circuit from the traveling contact to a ground or a return wire, a thermostat connected in said latter circuit and arranged to open said circuit when the temperature is above a predetermined degree and to close said circuit when the temperature is below a predetermined degree, a magnet connected in said thermostatic circuit, an armature adapted to be moved by said magnet, and a mechanical connection between the armature in the thermostatic circuit and the automatic switch in the heater-circuit, substantially as specified.

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