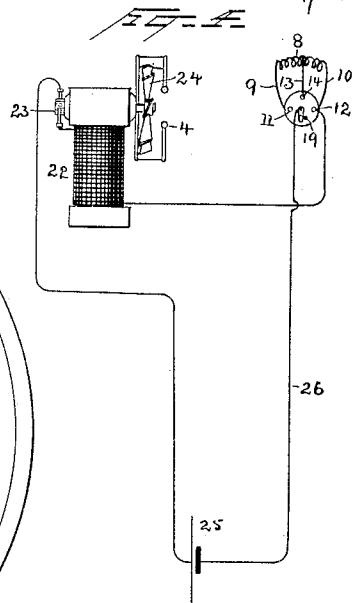
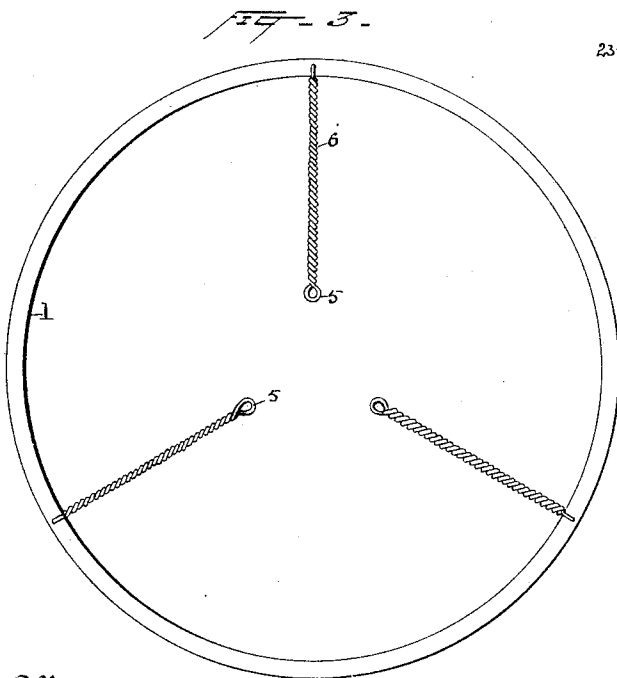
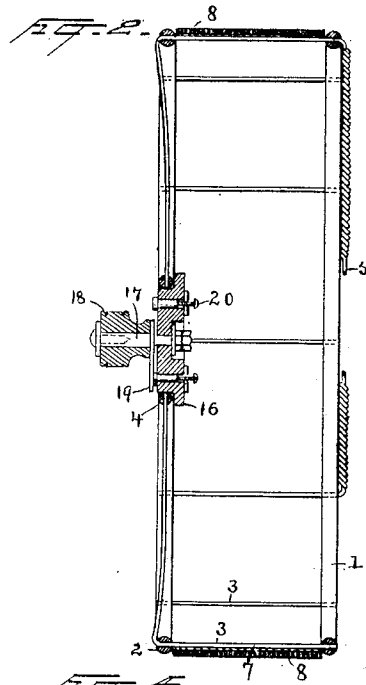
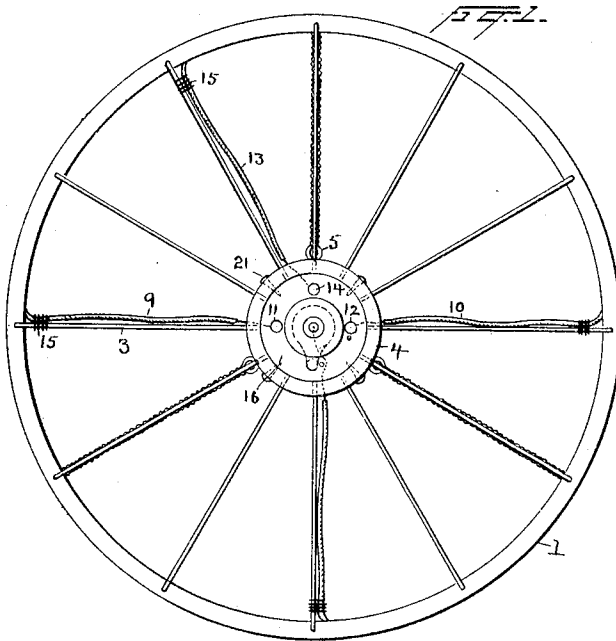


(No Model.)

W. S. ANDREWS & A. K. WARREN.  
RHEOSTAT.

No. 465,512.

Patented Dec. 22, 1891.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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PLACE.

## RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 465,512, dated December 22, 1891.

Application filed August 25, 1891. Serial No. 403,667. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM S. ANDREWS, a citizen of the United States, and ALDRED K. WARREN, a subject of the Queen of Great Britain, both residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Rheostats for Fan-Motors, of which the following is a specification.

The present invention relates to means for controlling the speed of electric motors used to drive ventilating-fans; and the invention consists in supporting a resistance-conductor on the fan-guard, and in certain combinations of devices hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a face view of the rheostat and controlling-switch. Fig. 2 is a central section through the same. Fig. 3 is a rear view of the guard, and Fig. 4 is a diagram indicating the connection of the resistance-conductor.

It is common, though not universal, to surround ventilating-fans with guards to prevent injury to the fan-blades and to direct the air forward. We have shown such a guard in the accompanying drawings. It consists of two metal rings 1 2, having a diameter slightly larger than the diameter of the fan and perforated at intervals for the reception of the cross rods or wires 3, which extend from the rear ring 1, through the front ring 2, to a central front ring 4. Some of the rods or wires are extended beyond the rear ring 1 and are bent to form loops 5, the free end of the wire being twisted around the body of the wire, as indicated at 6. The loops 5 provide means by which the guard may be secured to a suitable support. Between the rings 1 2 is a band 7, which may be of metal or of insulating material, and which rests directly upon the cross rods or wires 3. Evidently it is not essential that this band should be continuous or imperforate, or indeed that it should be used at all, since the resistance-conductor hereinafter described may be wound directly on the circle of rods or wires 3. On the outside of the band we wind a resistance-conductor 8. This is, preferably, German-silver wire insulated with any usual coating and wound in two layers, as indicated. The terminals of the

wire are connected by wires 9 10 to the two terminal pins 11 12 of the switch. From the center of the resistance-wire a connection is made by means of wire 13 to the terminal 14 of the switch. The wires 9 10 13 are suitably insulated and are led along the rods or wires 3, being preferably bound to said wires, as indicated at 15.

The switch device placed at the center of the guard and supported by the ring 4 consists of a hard-rubber base or other insulating material 16, at the center of which is a spindle 17, carrying a handle 18, on which is a switch-arm 19. Near the outer edge of the base are metal pins 11 12, &c., to which the circuit-wires may be connected by means of binding-screws 20. This switch is put in place from the rear of the guard, the main body of the base passing through the ring until the lower flange of the base rests against the ring. Screws 21 (see Fig. 1) are then passed through the ring into the base, securing it in place. In Fig. 4 is indicated an electric motor having a field-magnet coil 22 and an armature 23, to the shaft of which is secured a fan 24, around which is the guard. The switch which belongs within ring 4 (shown in section in Fig. 4) and the resistance-conductor are shown detached from the guard in the diagram for convenience of illustration. The terminal 11 is connected to one end of the conductor 8. The opposite end is connected to terminal 12, which is connected to the field-magnet coil, and thence through the armature to the generator 25, the opposite pole of which is connected by wire 26 to a switch-arm 19. When the arm is moved from the position in which it is shown onto contact 11, the circuit through the motor is closed, and all of the resistance 8 is in circuit, and the motor will run slowly. If the switch-arm is moved to contact 14, one-half of the resistance will be thrown out of circuit and the motor will run faster, and when the arm is moved onto contact 12 all of the resistance 8 is thrown out of circuit and the motor runs at full speed.

By mounting the resistance-wire directly on the guard, as described, we avoid the necessity of using a separate and independently-mounted resistance occupying valuable space, and the conductor, being wound around the

guard, has a large part of its surface exposed to the air, and the operation of the fan tends to keep the conductor cool.

What we claim is—

- 5 1. The combination of a fan-guard and a resistance-conductor mounted directly thereon, substantially as described.
2. The combination of a fan-guard and a resistance-wire wound around said guard, substantially as described.
- 10 3. The combination of an electric motor, a fan driven thereby, a fan-guard, and a resistance-conductor on said guard for regulating the electric motor, substantially as described.
- 15 4. The combination of an electric motor, a fan driven thereby, a fan-guard, a resistance-conductor thereon, and a switch for throwing more or less of the resistance into the motor-circuit to regulate its speed, substantially as described.
- 20 5. The combination of a fan-guard, a resistance thereon, and a switch at the center of the guard and connected to the resistance-conductor, substantially as described.

6. The combination, in a fan-guard, of the front and rear rings, the wires connecting the same, the band between said rings, and the resistance-conductor on said bands, substantially as described.

7. The combination of a fan-guard, a conductor on said guard, a switch at the center of the guard, and conductors extending from said switch to the conductor on the guard, substantially as described.

8. The combination, with a fan-guard having a central ring 4, of a switch supported in said ring, substantially as described.

9. The combination of an electric motor, a fan driven thereby, a guard for the fan, and a switch at the center of the guard for controlling the motor, substantially as described.

This specification signed and witnessed this 21st day of August, 1891.

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Witnesses:

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