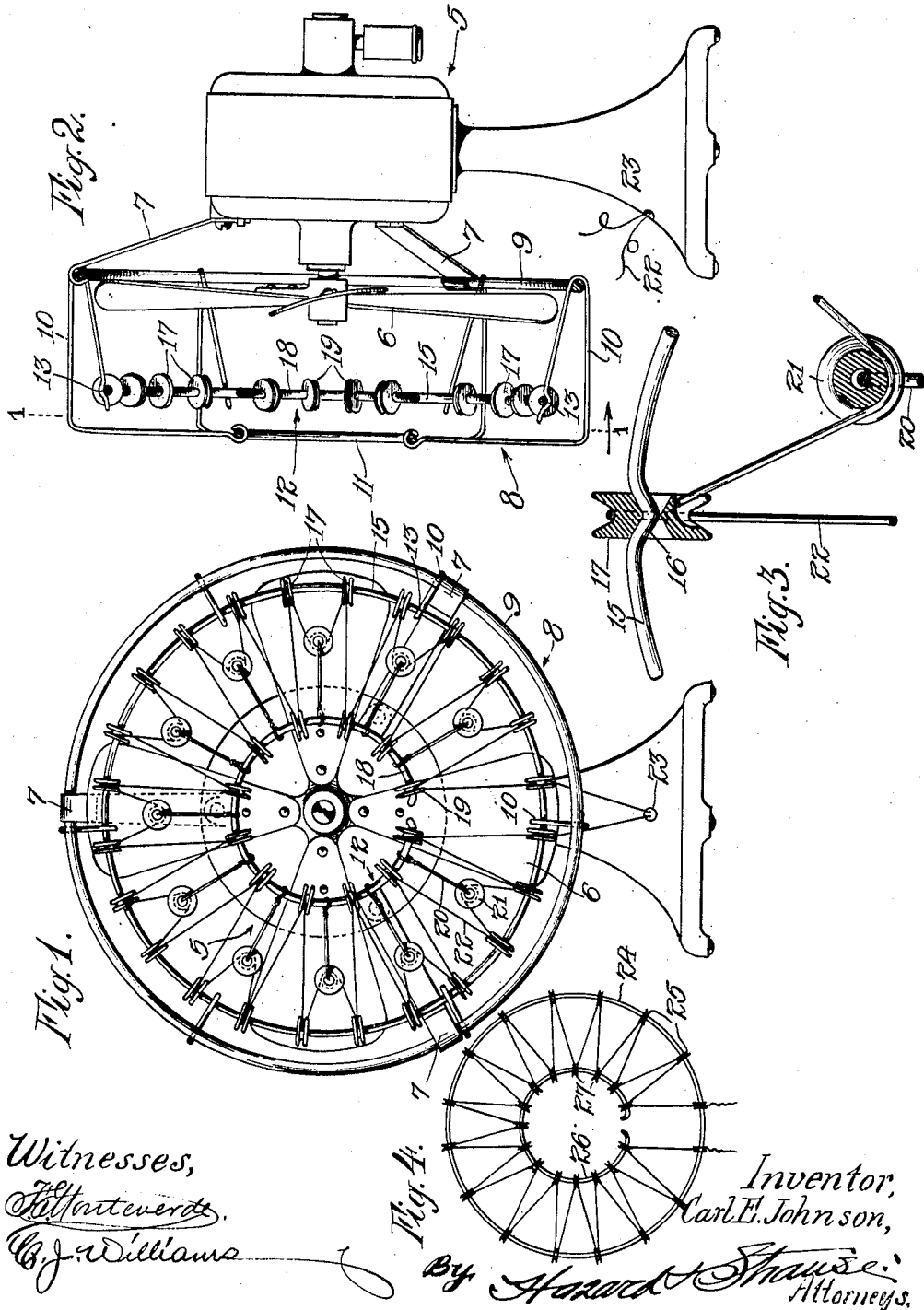


933,989.

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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

933,989.

Specification of Letters Patent. Patented Sept. 14, 1909.

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To all whom it may concern:

Be it known that I, CARL E. JOHNSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Electric Heaters, of which the following is a specification.

My invention relates to that class of electric heaters in which a continuous blast of air is forced against and through an electrical heating element, and an important object of my invention is to provide a simple and effective device which may be readily connected in place on an ordinary electric fan motor, and which will utilize a low amperage in comparison to the volume of heat delivered thereby.

Another object is to provide a heater that is readily detachable from the motor on which it is mounted, thus permitting the fan to be used for cooling purposes.

Another object is to provide a heater in which a constant tension on the resistance wires of which the heating element is formed will be automatically maintained while the electric current is passing therethrough.

A further object is to provide an electric heater that is simple in construction and highly efficient in operation and economical in current consumption.

In the accomplishment of the above recited objects I preferably employ an electrical iron resistance wire mounted on a plurality of concentric metallic rings properly insulated therefrom, the whole being detachably secured to the fan guard of an electric fan motor. Provision is also made whereby the circuit for supplying the motor is utilized for supplying the current to the heating element, so that the fan motor and heating element are simultaneously operative or inoperative.

In the annexed drawings forming a part of the specification: Figure 1—is a front elevation of a fan motor taken on line 1—1 of Fig. 2 with my heating device in place thereon. Fig. 2—is a side elevation of a fan motor with the guard and heater in section. Fig. 3—is a detail of the method of mounting the resistance wire. Fig. 4—is a face view of another form of heater.

Referring more particularly to the drawings, 5 designates an electric fan motor provided with a rotatable fan 6 of usual form. Detachably secured to the face of the motor

frame by means of bearing arms 7 is a wire fan guard 8 of a construction that will permit of an easy attachment of my electric heater which will be fully described hereinafter. Guard 8 preferably consists of a wire ring 9 having rigidly secured thereto a plurality of wires 10 which extend at right angles therefrom, and are then bent inwardly and radially as shown in Fig. 2, the ends rigidly engaging a smaller centrally disposed wire ring 11, thus forming the wire guard frame of the motor fan. The inner ends of fan guard wires 10 project from their point of attachment to ring 9 at an angle therefrom, so as to form a resilient annular bearing for the reception of the electric heating element 12, the ends of each wire being bent to form a seat 13.

The electric heating element above referred to preferably consists of an annular wire ring 15 being bent inwardly at equal intervals as at 16 and as best shown in Fig. 3 to form bearings for a plurality of grooved lava insulators 17 upon which the resistance wires are strung. Concentrically mounted inside of ring 15 is a second annular ring 18 which is in the form of a compression spring. Mounted on this ring are a series of insulators 19 similar to the insulators 17 mounted on ring 15 and between each two adjacent insulators is mounted a bearing arm 20 which projects outwardly and radially therefrom, on the end of which is mounted a grooved insulator 21 similar to the others. Resistance wire 22 of the heater is attached to terminals in the base (not shown) and is in electrical connection with the circuit of the fan motor so that the heater and motor may operate in unison. Wire 22 from its terminal in the motor base passes through an aperture 23 formed therein, and is woven continuously around the various insulators as best shown in Fig. 1 of the drawings, the end of the wire as it leaves the last insulator passing through the aperture 23, and is connected to another terminal on the connection board (not shown) in the motor base.

In the form of heater illustrated in Fig. 1, the arms 20 are supplied to the compression spring 18, thus enabling a greater percentage of the resistance wire to be strung adjacent to the outer ends of the fan blades 6, the air being forced in greater volume from that area.

In Fig. 4 is illustrated another form of heater which is preferably composed of a ring 24 similar to the ring 15, and is provided with a series of insulators 25 similar to the other insulators. This form of heater is supplied, as in the preferred form, with a compression spring 26 upon which another series of insulators 27 are mounted, a resistance wire being woven around the various insulators as in the first described form. The compression spring is utilized for the purpose of maintaining an even tension on the resistance wire when the current is passing therethrough, as when the wire is heated it has a tendency to buckle and increase in length, thereby disarranging and sometimes rendering the heating element inoperative.

When it is desired to detach the heating element from the fan guard, the guard itself is first detached from the bearing arms 7, after which the heater may be easily detached therefrom, the ends of the wire leading from the heater to the terminals on the connection board being disconnected. The fan may then be used for cooling or other purposes.

It will be observed from the foregoing description that I have provided a novel form of heater, whereby the resistance wires of which it is formed will at all times be maintained in an adjusted position, and one that is extremely economical and efficient in operation.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In an electric heater, the combination with an air forcing means, of an electric heating element detachably secured thereto, and means to automatically adjust the heating element while an electric current is passing therethrough.

2. In an electric heater, the combination with an air forcing means, of an electric heating element detachably secured thereto, and a compression spring secured to said heating element, said spring adapted to maintain said element in tension while a current is passing therethrough.

3. In an electrical heater, the combination of an electric fan motor, of an electric heating element detachably secured thereto, said element and motor being connected in parallel, and means to automatically adjust the heating element while a current is passing therethrough.

4. In an electric heater, the combination of an electric fan motor, of an electric heating element comprising an electric resistance, said element being detachably secured to said fan motor and both being connected in parallel, and means to automatically adjust the heating element while a current is passing therethrough.

5. In an electric heater, the combination

of an electric fan motor, of an electric heating element secured thereto, said element and motor being connected in parallel, and means to automatically adjust the heating element while a current is passing therethrough.

6. In an electric heater, the combination of an electric fan motor, of an electric heating element secured thereto, said element consisting of an endless annular ring and an annular compression spring concentrically mounted therein, and a resistance wire connecting the ring and the spring, whereby a constant tension is maintained on the wire while the heater is in operation.

7. An electric heater, comprising an annular ring and a compression spring concentrically mounted therein, and a resistance wire connecting said ring and spring.

8. In an electric heater, the combination of an air forcing means, of an electric heating element detachably secured thereto, said element comprising a frame having insulators mounted thereon, a resistance wire mounted on the insulators of said frame, and means to maintain a tension on the resistance wire during the operation of the heater.

9. In an electric heater, the combination of a fan motor, of an electric heating element detachably secured thereto, said element comprising a frame having insulators mounted thereon, a resistance wire mounted on the insulators of said frame, and resilient means to maintain a tension on the resistance wire during the operation of the heater.

10. An electric heater, comprising an annular wire frame provided with suitable insulators, a compression spring concentrically mounted within said annular frame and provided with a plurality of insulators, and a resistance wire passing around the insulators mounted on the frame and compression spring, said wire being connected to a source of electric energy.

11. In an electric heater, the combination with a fan motor provided with a fan guard, and an electric resistance detachably secured to said guard.

12. In an electric heater, the combination with a fan motor provided with a fan guard, of a heating element detachably secured thereto, said element comprising a wire frame provided with insulators, and an electric resistance wire on said frame, said wire passing around said insulators.

13. In an electric heater, the combination of an electric fan motor, of an electric heating element secured thereto, said element comprising two wire rings of different diameters concentrically arranged with respect to each other, a plurality of insulators mounted on each ring, and an electric resistance wire connecting the two rings, said wire passing around and over the insulators on the rings.

14. In an electric heater, the combination

of an electric fan motor, of an electric heating element held in spring pressed engagement therewith, said element comprising two wire rings of different diameters concentrically arranged with respect to each other, a plurality of insulators mounted on each ring, and an electric resistance wire connecting the two rings, said wire passing around and over the insulators on the rings.

10 15. In an electric heater, the combination with a fan motor, a protective wire guard

secured to said motor frame, a resilient holder formed integrally with said guard, and an electric heating element, said element detachably mounted in said holder. 15

In witness that I claim the foregoing I have hereunto subscribed my name this 15th day of January, 1909.

CARL E. JOHNSON.

Witnesses:

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