No. 710,143. Patented Sept. 30, 1902.

H. P. DAVIS.

RESISTANCE COIL AND SUPPORT THEREFOR.

(Application filed Dec. 26, 1901.)

(No Model.)

Fig. 1.

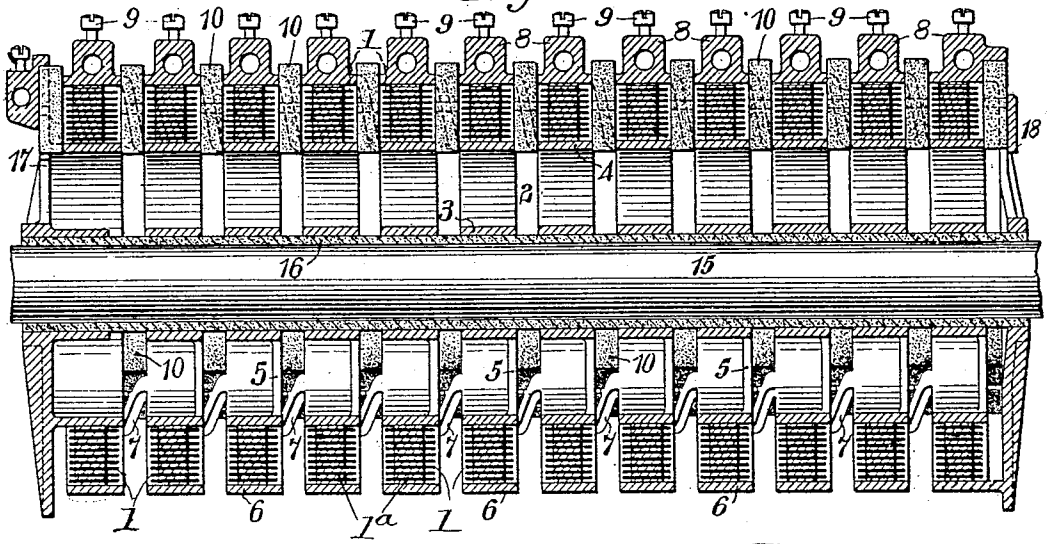


Fig. 2.

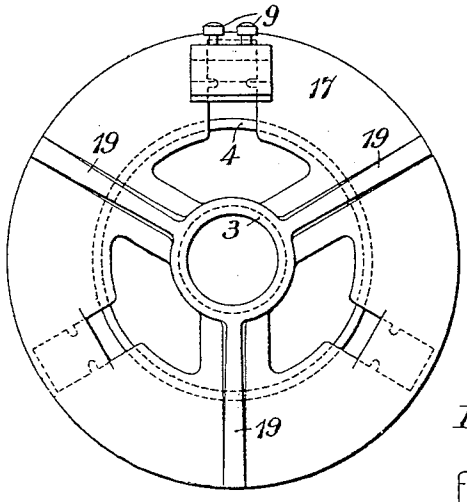


Fig. 3.

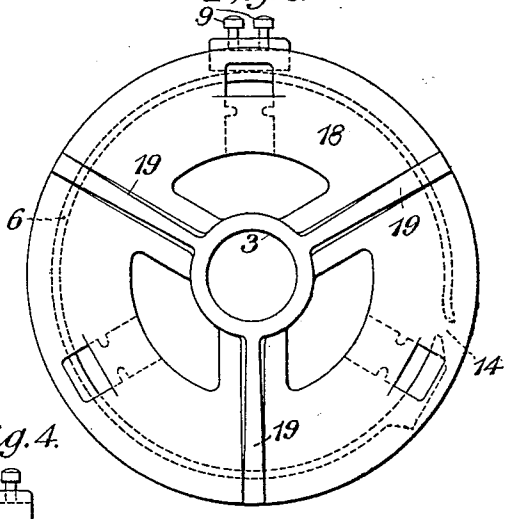
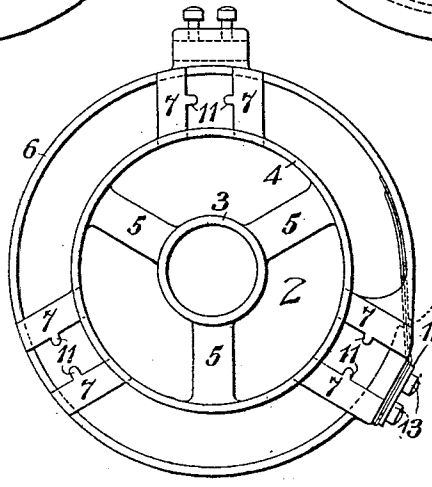


Fig. 4.



WITNESSES:

C. L. Belcher

Birney Hines

INVENTOR

Harry P. Davis

BY

Kerley G. Barr

ATTORNEY

UNITED STATES PATENT OFFICE.

HARRY PHILLIPS DAVIS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING CO., A CORPORATION OF PENNSYLVANIA.

RESISTANCE-COIL AND SUPPORT THEREFOR.

SPECIFICATION forming part of Letters Patent No. 710,143, dated September 30, 1902.

Application filed December 26, 1901. Serial No. 87,305. (No model.)

To all whom it may concern:

Be it known that I, HARRY PHILLIPS DAVIS, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Resistance-Coils and Supports Therefor, (Case No. 1,026,) of which the following is a specification.

My invention relates to resistance apparatus for use in connection with electrical circuits; and it has for its object to provide a simple and inexpensive element comprising a resistance-coil and a supporting-frame therefor and also a series of such elements which may be readily and inexpensively combined, so as to constitute a compact, thoroughly-ventilated, and durable resistance-column.

My invention is an improvement upon the subject-matter of Patent No. 513,457, granted to the Westinghouse Electric & Manufacturing Company on the 23d day of January, 1894, on an application filed by me.

My invention is especially useful in connection with the operation and control of railway-motors, but is obviously susceptible of use in any other relations where it is desired to introduce a greater or a less amount of resistance into an electric circuit.

Referring now to the drawings, Figure 1 is a longitudinal sectional view of a resistance-column constructed in accordance with my invention. Figs. 2 and 3 are elevations of the respective end frames of the column shown in Fig. 1, and Fig. 4 is an elevation of one of the intermediate frames.

The resistance unit or element 1 is in the present case a spiral coil of strap metal of suitable composition and dimensions for the purpose desired, the several turns being insulated from each other by intercoiled insulating material 1^a—such, for example, as scraps of mica. This insulating material preferably projects laterally beyond the edges of the metal strip, as indicated in the drawings.

The frame 2 for supporting the coil comprises two concentric rings 3 and 4 in the same plane and connected by a plurality of arms or spokes 5 and a third ring 6 of greater diameter and located in an adjacent plane, the ring 6 being joined to the ring 4 by means of a plurality of pairs of approximately parallel arms 7. The difference between the external diameter of the ring 4 and the internal diameter of the ring 6 is substantially equal to the thickness of the coil, so that after each coil is wound upon the outside of the ring 4 it will fit inside of the ring 6 of the adjacent supporting-frame 2. Each ring 6 may be provided at one side with a perforated lug 8 to receive a conductor and with binding-screws 9 to clamp the conductor thereto.

In order to space apart the adjacent frames 2 and properly insulate them from each other, I interpose between them a plurality of blocks 10, of insulating material. I have found that pressed asbestos is a desirable material of which to make these blocks; but any other material that may be found suitable may obviously be employed. In order to prevent dislodgment of the blocks 10, I may provide the arms 7, between which the blocks are located, with inwardly-projecting lugs 11 and form the blocks with corresponding grooves or recesses, into which the lugs fit. The inner end of each resistance-coil may be fastened to the ring 4, on which it is wound, by any suitable means, and its outer end may be also fastened to the ring 6 of the adjacent frame by any desired means. For the latter connection I have shown in Fig. 4 a plate 12 and clamping-screws 13, an opening 14 being provided in the ring 6 adjacent to the clamping device, through which the end of the strip may project.

Any desired number of frames and coils may be combined to form a column, and for the purpose of suitably clamping and supporting the several elements I mount them upon a rod 15, from which they are insulated by means of a tube 16, of suitable non-conducting material. The end frames 17 and 18 are made of slightly-different form from the inner frames and are provided with strengthening-ribs 19, as indicated in Figs. 2 and 3. The several elements of the column may be clamped together upon the rod 15, so as to constitute a durable compact structure, by means of binding screws or nuts or any other suitable clamping devices. (Not shown.)

When thus combined, it will be noted that the individual members of the column are spaced apart, so as to provide thorough ventilation, that the individual coils are well insulated from each other, and that the whole structure is inexpensive and compact in construction and arrangement.

My invention may obviously be modified as regards minor details of construction without departing from the invention, and I therefore desire it to be understood that the invention is not limited, except in so far as limitations are specified in the claims.

I claim as my invention—

1. A resistance element comprising two rings of different diameters projecting in opposite directions from an open-work frame, a spiral coil of resistance material surrounding the smaller ring and a plurality of insulating-blocks mounted in the frame at one side of the coil.

2. A resistance element comprising two rings of different diameter located in parallel planes and connected by a plurality of parallel arms and insulating-blocks severally located between said pairs of arms.

3. A frame for a resistance-coil comprising two rings of different diameter and located in parallel planes and connected by a plurality of pairs of substantially parallel arms.

4. A resistance-column consisting of a set of superimposed frames each of which comprises two rings of different diameter located in different planes and connected by a plurality of pairs of arms, insulating-blocks between the several pairs of arms and resistance-coils concentrically disposed between the several rings of lesser diameter and the rings of larger diameter that pertain to the adjacent frames.

5. A resistance-column consisting of a set of superimposed annular frames each of which comprises two concentric rings in the same plane and a third ring in a different plane, a plurality of pairs of arms between the last-named ring and the outer ring in the other plane, insulating-blocks between the several pairs of arms and spiral resistance-coils interposed between the outer rings and the rings of lesser diameter pertaining to adjacent frames.

6. A resistance-element frame comprising two concentric rings in the same plane connected by radial arms, a third ring in a different plane and a plurality of pairs of arms between the third ring and the outer ring in the other plane.

7. A resistance element consisting of a frame comprising two concentric rings and connecting-arms, a third ring in a different plane and a plurality of pairs of arms between the same and the outer ring in the other plane and a spiral coil of interleaved, conducting and non-conducting strips wound upon one of said rings.

8. A resistance-column consisting of a rod and a set of resistance elements mounted thereon, each of which comprises a frame having two rings of different diameter located in parallel planes and connected by a plurality of pairs of arms, non-conducting blocks located between said arms and a spiral resistance-coil interposed between each ring of lesser diameter and the concentrically-disposed ring pertaining to the adjacent frame.

In testimony whereof I have hereunto subscribed my name this 16th day of December, 1901.

HARRY PHILLIPS DAVIS.

Witnesses:
H. N. BARTLETT,
JOS. W. ALEXANDER.