(No Model.)

A. J. WURTS.

DEVICE FOR PROTECTING ELECTRIC CIRCUITS.

No. 574,979. Patented Jan. 12, 1897.

Fig. 1.

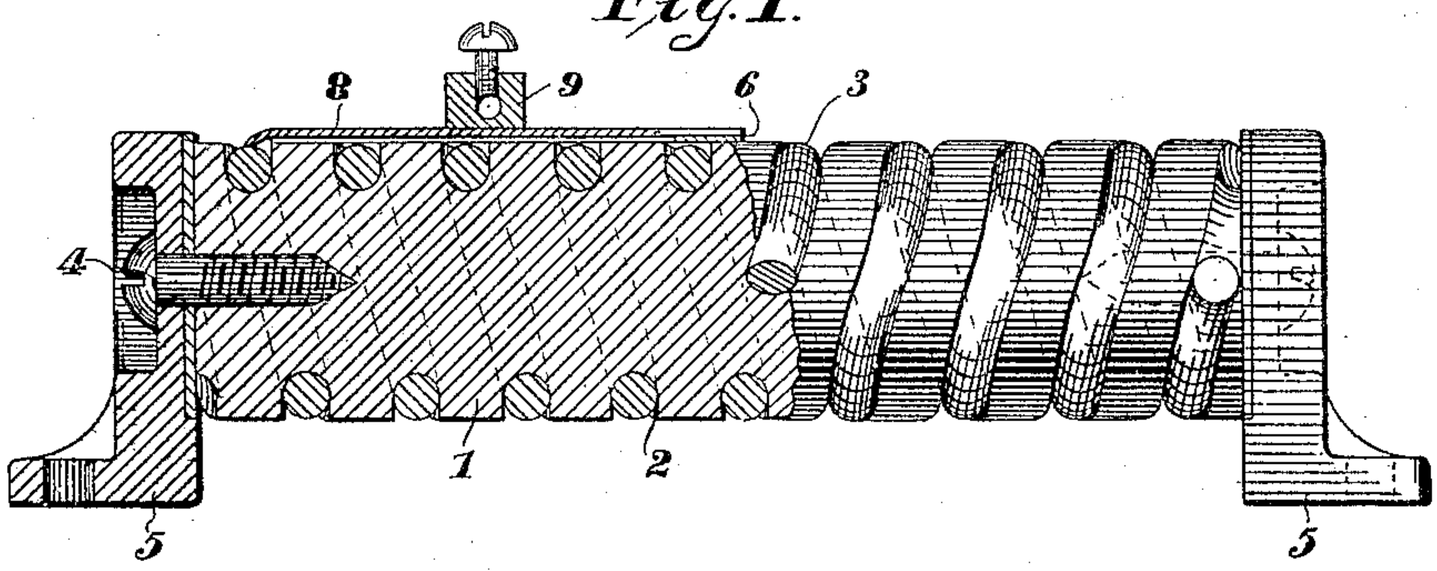
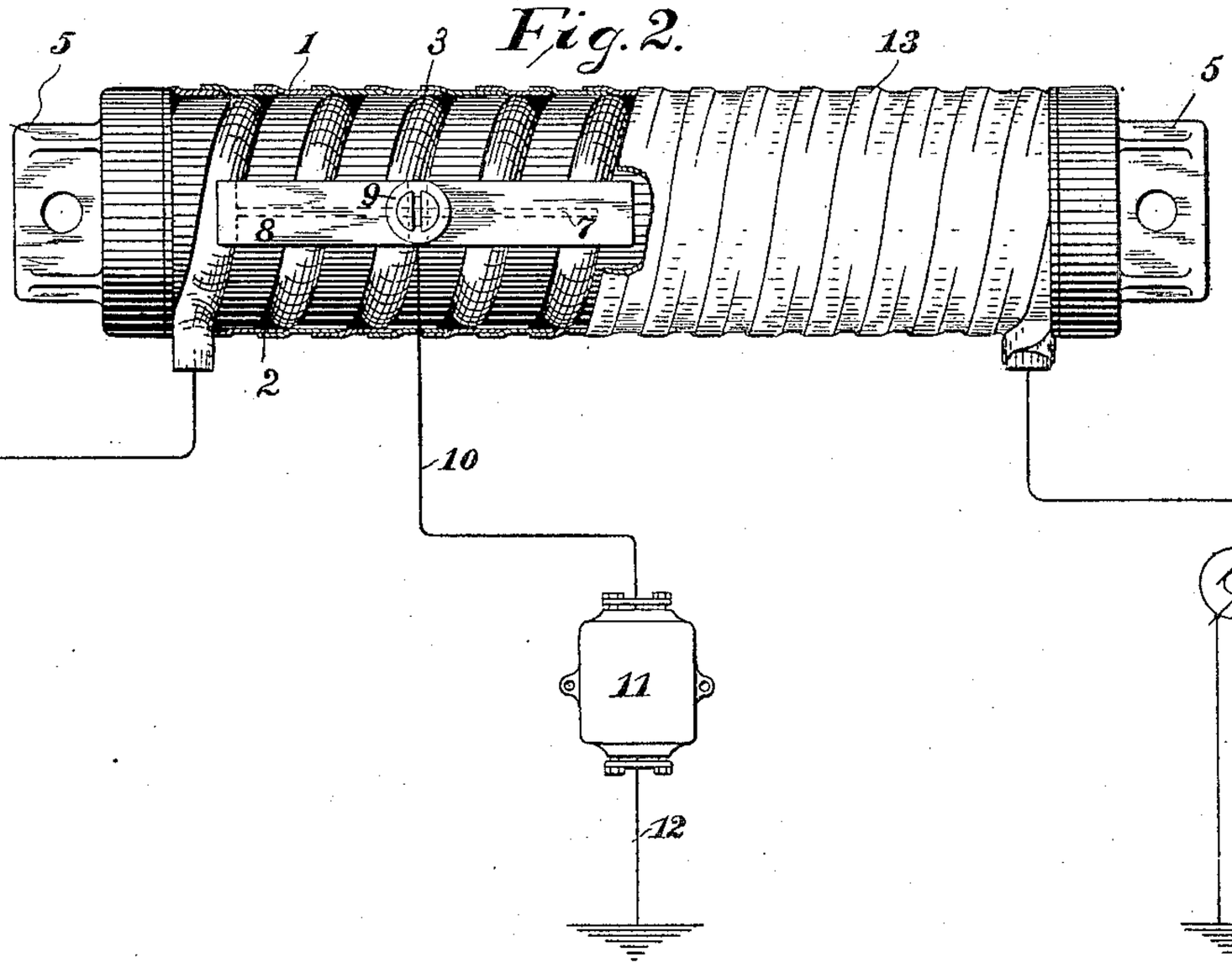


Fig. 2.



WITNESSES:

Ethan D. Dodd

H. C. Fenner

INVENTOR

Alexander Jay Wurts

BY

Terry, Mackaye & Carr

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALEXANDER JAY WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

DEVICE FOR PROTECTING ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 574,979, dated January 12, 1897.

Application filed October 2, 1895. Serial No. 564,404. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER JAY WURTS, 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 Devices for Protecting Electric Circuits, (Case No. 670,) of which the following is a specification.

My invention relates to that class of apparatus which is employed for protecting electrical circuits and connected machines and apparatus from the injurious effect of static charges derived from the atmosphere; and it has for its object to produce an apparatus for this purpose which will be more certain and effective in operation than have been the devices heretofore usually employed.

I have found by experiment that the static pressure or tendency to discharge varies in intensity at different points in a given length of conductor, and that such points are apt to occur at irregular intervals. In view of these conditions I have been led to believe that the tendency to discharge is due to the combination of a greater or less number of series of waves the algebraic sums of which give resultant pressures for which it is necessary to provide discharge-paths to the ground.

As it is impossible to determine in advance at just what point or points the greatest pressure will be exerted, I propose to introduce a choke-coil into the line which will act to impede the passage of the static charge along the line conductor and to provide a considerable number of discharge-paths arranged at frequent intervals along the coil, in order to insure the intercepting of some, at least, of the points of highest pressure. I propose to also interpose a spark-gap in each discharge-path, unless a lightning-arrester is included in the ground-conductor, in order to prevent the passage of the dynamo-current and the consequent short-circuiting of the coil. In any event the introduction of the spark-gap is necessary in all but one of the discharge-paths referred to.

In the accompanying drawings, Figure 1 is a choke-coil, shown partially in section and partially in side elevation, constructed in accordance with my invention. Fig. 2 is a plan view of the coil, showing also the circuit connections.

Reference being now had to the details shown in the drawings, 1 is a cylinder or core formed of wood or other insulating material and provided with a helical groove 2 for the reception of the bare wire 3, constituting the coil proper. The core 1 has fastened to it at each end by means of a screw 4 a base-piece or standard 5, by means of which the coil may be fastened in position upon any desired base or support.

6 is a plate or strip formed of fiber or other suitable insulating material and provided with a narrow longitudinal slot 7, extending nearly throughout its length. Located upon this strip of insulating material is a strip or plate 8 of some good conducting material, preferably copper, which is approximately of the same width and length as the insulating-strip 6. As shown in the drawings, one end of this conducting-strip 8 is bent into contact with the end turn of the coil 3; but it may be a straight strip held out of contact with all of the turns over which it is placed, if desired.

Suitably fastened to the upper side of the strip, preferably by means of solder, is a binding-post 9, this binding-post serving to connect one end of the conductor 10 to the strip 8.

It is to be understood that devices materially different in form and dimensions from the parts 6 and 8 may be employed, if desired, the invention being in no wise limited as regards the specific construction of these devices.

11 is a lightning-arrester, one side of which is connected to the conductor 10 and the other side to one end of the conductor 12, the other end being grounded, as shown. The coil and strips 6 and 8 are preferably wound with an insulated covering 13, in the present instance shown as applied in the form of tape, which is wound spirally around the coil and core and serves to complete the insulation of the coil and also to protect it and hold the strips 6 and 8 in position thereon.

It will be understood that the lightning-arrester 11 may be omitted from the organization; but in such case it will of course be es-

sential to keep all parts of the strip 8 out of contact with the coil 3.

It will be readily apparent from the construction shown and described that a small spark-gap is interposed between each turn but one of the coil 3 over which the strip 8 extends and that a single path for the static discharge is provided from the strip 8 to the ground.

As shown in the drawings, I prefer to leave several turns of the choke-coil at the end nearest the machine or apparatus to be protected unprovided with discharge-paths, and consequently extend the strips 6 and 8 over a portion only of the length of the coil, this construction being adopted in order to prevent the return of a discharge or portion of a discharge from the conducting-strip 8 around the end of the coil to the line. With the construction shown the distance between the end of the coil nearest the machine (indicated diagrammatically at 14) and the corresponding end of the conducting-strip 8 is sufficient to preclude the jumping of a discharge from the conductor around the end of the coil to the line and thence to the machine.

While I have illustrated and described a specific combination and arrangement of parts as embodying my invention, I desire it to be understood that the invention is not limited to the details shown, which may be considerably varied in practice, if desired.

I claim as my invention—

1. The combination with a lightning-arrester having a ground connection, of a choke-coil, and a conducting-strip extending along said coil for a portion of its length whereby spark-gaps are formed between the same and the adjacent turns of the coil, and an electrical connection between said strip and the lightning-arrester.

2. A choke-coil provided with a conducting piece or strip located adjacent to but not in contact with several of the turns thereof, whereby spark-gaps are formed between said turns and said strip.

3. A choke-coil provided with a conducting piece or strip located adjacent to, but not in contact with, several consecutive turns thereof, whereby spark-gaps are formed between said turns and said strip, in combination with a lightning-arrester interposed between said piece or strip and the ground.

4. A choke-coil provided with a conducting piece or strip adjacent to several of the turns thereof and a slotted insulating-strip interposed between said conducting-strip, and said turns, in combination with a lightning-arrester interposed between said conducting-strip and the ground.

5. The combination with a lightning-arrester, of a choke-coil provided with a slotted strip of insulating material in contact with several of the turns thereof, a conducting-strip on said insulating-strip and an insulating-covering for said parts.

6. A choke-coil comprising a helically-grooved core formed of insulating material, a coiled, bare conductor seated in said groove, a conducting-strip located adjacent to but out of contact with said bare conductor and provided with a binding-post, and an insulating-covering for said coil and strip.

7. A choke-coil comprising a helically-grooved cylinder, a coiled bare conductor seated in said groove, a slotted strip of insulating material extending longitudinally of said cylinder for a portion of its length, a conducting-strip upon said insulating-strip, and a protecting and insulating covering wound upon said parts.

In testimony whereof I have hereunto subscribed my name this 27th day of September, A. D. 1895.

ALEXANDER JAY WURTS.

Witnesses:

LEON LE PONTOI,

JAMES B. YOUNG.