

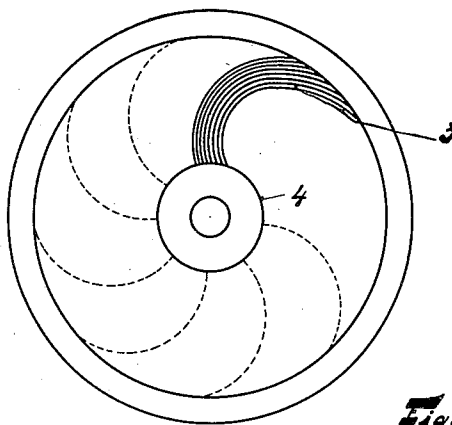
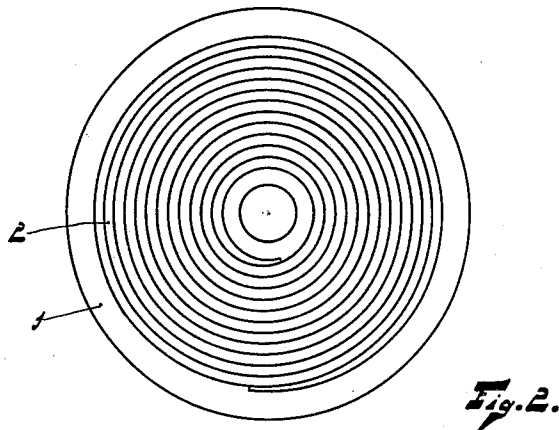
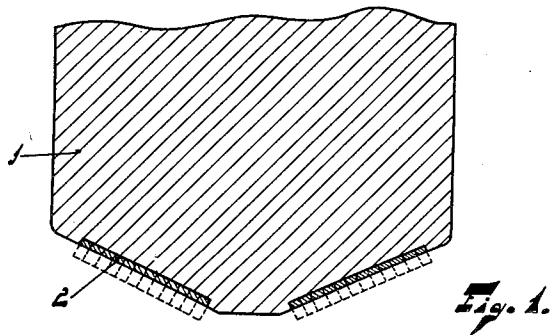
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X-RAY TUBE IN WHICH THE ACTIVE SURFACE OF THE ELECTRODE
EMITTING RAYS IS PROVIDED WITH SEAMS

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X-RAY TUBE IN WHICH THE ACTIVE SURFACE OF THE ELECTRODE EMITTING RAYS IS PROVIDED WITH SEAMS

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10 Claims. (Cl. 250—35)

The present invention relates to X-ray tubes in which the active surface of the radiating electrode is provided with seams, as described in my companion application, Ser. No. 497,859 filed November 24, 1930, now U. S. Patent No. 1,927,456.

The invention concerns an X-ray tube in which this surface is constructed in such manner that not only can it be manufactured in a very simple manner but it is also particularly adapted to the purpose in view. The invention is of particular importance for tubes in which the radiating electrode rotates during operation.

In the X-ray tube according to the present invention the radiating surface is formed of a plurality of wire- or band-shaped bodies in contact with one another or of a plurality of mutually contiguous windings or loops of one or more such bodies.

A very suitable embodiment is that in which one or more wire- or band-shaped bodies are wound so as to form a spiral whose turns are in contact with one another.

If desired, wires or bands of constant width which are bent so as to form a substantially closed surface, may be utilized to constitute the radiating surface.

An electrode having a surface as above described is manufactured in a simple manner as follows: A wire or band, for example of tungsten, is spirally wound so as to form a ring or disc whose turns are in contact with one another. This ring or disc is secured in the usual manner in a carrying body of a material having good heat conducting properties, for example of copper, and ground off or otherwise machined in such manner that a closed surface is obtained.

It has been found that X-ray tubes comprising rotary anodes whose tungsten face plate consists, in accordance with the invention, of a spirally wound wire, can be more heavily loaded and have a longer life than the tubes hitherto used. The formerly occurring phenomenon of the tungsten face plate scaling off into a large number of pieces which separated from the carrying body and which diminished the efficiency of the tube to a great extent, is counteracted by the invention. The invention therefore increases the possibility of application and the usefulness of X-ray tubes comprising a rotary anode.

The invention will be more clearly understood by referring to the accompanying draw-

ing which represents, by way of example, some embodiments thereof.

Figure 1 is a sectional view of part of the anode of an X-ray tube, which anode is adapted to be rotated for instance, by being embodied in the rotor of an induction motor.

Figure 2 is a front view of the anode of Figure 1 and

Figure 3 is a front elevation of an anode whose active surface has been otherwise formed.

Referring to Figure 1, 1 is an anode comprising a carrier of copper to which is secured a face plate 2 consisting of a metal which has a high atomic number, for example tungsten. The section of this face plate shows a plurality of mutually contiguous laminations which form however an uninterrupted or smooth surface. These laminations are produced by the face plate, instead of consisting of a full ring, being formed by winding a metal band into a spiral with mutually contiguous turns. Since a wire cannot easily be formed into a rigid disc or ring it is advantageous to utilize a band even though in the latter case the waste of material is greater. A band better preserves its shape. The original height of the band is indicated by a dotted line. The front face of the anode has a shape as shown in Figure 2.

By grinding off the spirally wound band after a carrying body has been cast on to it, a perfectly smooth surface is formed which apparently does not differ from the usual ring-shaped face plate. During operation, however, the difference distinctly manifests itself; after an equal number of analogous loads the anode, according to the invention is still perfectly intact, at any rate not attacked to an extent worth mentioning, whereas the anode according to the formerly used construction has been strongly deteriorated by the load.

Fig. 3 represents the front face of an anode constructed in accordance with another embodiment of the invention and in which instead of a single band, use is made of a plurality of wire- or band-shaped bodies 3 which extend radially from the circle 4 and which are bent so as to form an entirely closed surface which, in comparison to a face plate of the full material, affords similar advantages as the construction according to Figures 1 and 2. In this case, too, by grinding off the bands arranged on edge a thin face plate can be obtained which seemingly has no interruptions but which, notwithstanding, has

a large number of seams which afford the anode its excellent properties.

What I claim is:

1. An anode for an X-ray tube comprising a target of refractory metal on a backing member of good heat conductive material, said target being constituted by at least one spirally wound wire having contiguous loops or convolutions.
2. An anode for an X-ray tube comprising a target of refractory metal inserted in a backing member of good heat conductive metal, said target being made of a plurality of contiguous convolutions of wire joining each other so as to form a disc having the thickness of the wire.
3. An anode for an X-ray tube comprising a target of refractory metal inserted in a backing member of good heat conductive metal, said target being subdivided into a plurality of curvilinear band-shaped areas of the same metal which are separated by substantially closed seams.
4. An anode for an X-ray tube comprising a ring-shaped target of refractory metal inserted in a backing member of good heat conductive metal, said target being formed of a plurality of band-shaped elements of constant breadth which start from the inside of the ring and extend radially to the circumference so as to form a substantially closed surface.
5. An anode for an X-ray tube having the form of a cylinder and having a conical end surface which embodies a target portion of refractory metal bounded by two circles of the conical surface and constituted by a spirally wound wire with contiguous loops.
6. A rotatable anode for an X-ray tube having a portion made substantially of copper and having an end surface comprising a ring-shaped tungsten disc adhering to the copper portion and made of a spirally wound wire, said wire being ground on the exterior surface of said disc to present a smooth surface, and not ground on the interior surface which adheres to the copper.
7. An anode for an X-ray tube comprising a refractory metal band spirally wound to form a disc having contiguous turns, and a body of good heat-conducting metal, the inner surface of said disc being united with said body, a portion of the outer surface of said disc being removed to produce a closed and smooth target surface.
8. An anode for an X-ray tube comprising a target of refractory metal formed of at least one wire or band having the edges thereof in abutting relation so as to form a substantially closed active surface.
9. An anode for an X-ray tube comprising a disc consisting of curvilinear metallic strip portions having contiguous edges and a copper body cast onto said disc, said disc being ground off at its outer surface to present a smooth exposed target surface.
10. An anode for an X-ray tube comprising a backing member and an insert of refractory metal forming the active surface of the anode, said insert consisting of at least one curvilinear wire or band having the edges thereof in abutting relation.

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