

H. GREEN.
ANODE FOR X-RAY TUBES.
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1,002,390.

Patented Sept. 5, 1911.

Fig. 1.

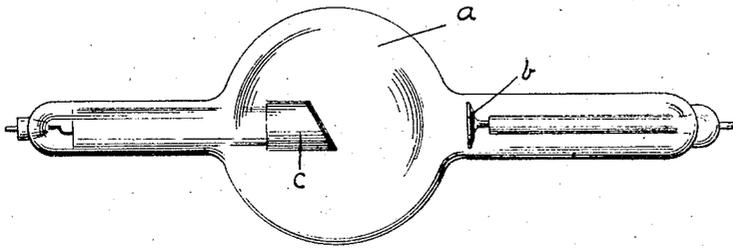
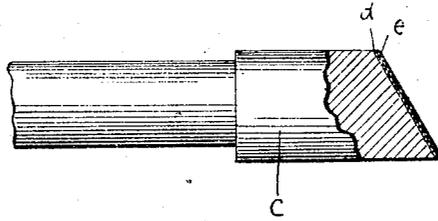


Fig. 2.



WITNESSES:

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ANODE FOR X-RAY TUBES.

1,002,390.

Specification of Letters Patent. Patented Sept. 5, 1911.

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To all whom it may concern:

Be it known that I, HENRY GREEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Anodes for X-Ray Tubes, of which the following is a specification.

The object of my invention is to provide an anode for an X-ray tube and a process for making said anode, both of which have features of novelty and advantage.

Figure 1 is an elevation of an X-ray tube. Fig. 2 is a representation of the anode of the tube enlarged, partly in cross section.

Referring to the drawings:—An ordinary X-ray tube *a* carries therein the customary poles, one a cathode *b* which has a concave surface. The current of electricity, known as the ions of the cathode stream, is focused by said concave surface to a point on the diagonal surface of the other pole or anode *c*. From this point the X-rays radiate. It is necessary to have the radiating surface of the anode *c* of high fusibility at the focusing point of the ions of the cathode stream to withstand their intense heat and also to have this surface connected by a perfect thermal contact to a good conductor of heat in order that the heat may be carried away with sufficient rapidity to prevent the surface being raised in temperature to the point of fusibility and thus being pierced by the ions.

Hitherto the method of constructing the anode has been to roll platinum on a thin sheet of nickel and solder the nickel side of the resulting sheet to the conductor. Since, however, nickel is a poor heat conductor, the platinum retained sufficient heat, when used with a very strong current, to raise it to its fusible point and cause it to be pierced by the ions of the cathode stream.

My method of constructing the anode is by rolling platinum on a sheet of copper and brazing the sheet to the copper conductor. The anode will thus be composed of a conductor *c*, a copper sheet *d*, and a platinum surface *e*.

By using this method and the metals specified I have constructed an anode which

is at the same time a good conductor of heat and a good conductor of electricity and in which a perfect thermal contact is obtained between the platinum surface and the conductor which permits the anode to be used without destruction in tubes of the highest power.

As modifications of the device: iridium, tantalum, or other metals of the platinum group or its alloys may be used instead of the platinum surface, while silver and other metals which have approximately the same conductivity of heat and electricity as copper may be used in place of the copper sheet. The conductor *c* may be of any metal of good conductivity.

Claims.

1. A target for use in X-ray tubes and the like comprising a face plate of highly refractory material and a back plate of relatively large mass of material having high heat conductivity, the two plates being united in an integral structure in the absence of extraneous uniting materials.

2. In an anode for use in X-ray tubes and the like the anode body and the target comprising a back plate of material having a high heat conductivity and the face plate of highly refractory material permanently and inseparably secured together with their opposing faces in actual contact throughout their entire area, said back plate having a relatively greater mass than said face plate and means for securing said back plate to said body.

3. In an anode for X-ray tubes and the like the anode body, and the target comprising a back plate and a face plate permanently and inseparably secured together with their opposing faces in actual contact throughout their entire area, said back plate having a relatively greater mass and heat conductivity than said face plate, said back plate being secured to said body by the interposition of a soldering material.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY GREEN.

Witnesses:

JOHN W. JAY,
SOLOMON ELSNER.