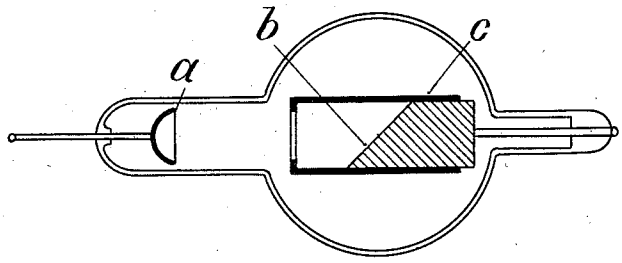
J. ROSENTHAL.

X-RAY TUBE.

APPLICATION FILED SEPT. 21, 1905.

1,028,969. Patented June 11, 1912.



Witnesses:
E. O. Niedebrandt
M. F. Anderson

Inventor:
Joseph Rosenthal
by Georgii Massie
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH ROSENTHAL, OF MUNICH, GERMANY.

X-RAY TUBE.

1,028,969. Specification of Letters Patent. Patented June 11, 1912.

Application filed September 21, 1905. Serial No. 279,423.

To all whom it may concern:

Be it known that I, JOSEPH ROSENTHAL, engineer, citizen of Germany, residing at Munich, Bavaria, Germany, have invented certain new and useful Improvements in X-Ray Tubes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention comprises improvements in or relating to Röntgen-ray tubes.

It is known that the Röntgen-rays emitted by ordinary Röntgen-tubes are not homogeneous, and that they comprise rays which vary to a very great extent in penetrative power.

The object of the present invention is to provide a Röntgen-tube by means of which mixtures of Röntgen-rays, in which rays of high penetrative power predominate, are obtained. For this purpose a screen may be arranged inside the tube, about the anticathode, consisting of material which is penetrated by the rays of higher penetrative power, but by which the rays of lower penetrative power are absorbed, said material being, for instance, sheet-iron, porcelain, or the like.

The drawing shows a section of one form of a Röntgen-tube embodying my invention.

Referring to the drawings, *a* is the cathode, *b* the anti-cathode, and *c* a cylindrical screen, for example, of sheet-iron, mounted on and surrounding said anti-cathode.

It will be noted that the rays emanating from the anti-cathode are directed against the walls of the cylindrical screen, whereby the rays of lower penetrative power are absorbed, while those of higher penetrative power pass outward, thus giving a more nearly homogeneous radiation.

Having thus fully described my invention, what I claim is:—

1. In a Röntgen apparatus, the combination, with the Röntgen tube, the cathode and the anticathode, of means arranged within said tube to permit the rays to pass directly from the cathode to the anticathode but to prevent the emanation of rays direct from the anticathode against the walls of the tube.

2. In a Röntgen apparatus, the combination, with the Röntgen tube, the cathode and the anti-cathode, of a screen arranged within said tube and surrounding the anti-cathode to permit the rays to pass directly from the cathode to the anticathode but to intercept all rays emanating directly therefrom.

3. In a Röntgen apparatus, the combination, with the tube, the cathode and the anticathode, of a screen mounted on the anticathode and surrounding the same to permit the rays to pass directly from the cathode to the anticathode but to intercept the rays emanating from the anti-cathode.

4. In a Röntgen apparatus, the combination, with the tube, the cathode, and the anticathode, of a cylindrical casing surrounding the anticathode and having an open end directed toward the cathode, the casing permitting the rays from the cathode to pass through its open end directly to the anticathode but acting to filter the rays emanating directly from the anticathode.

5. An X-ray tube having a massive target of material substantially impervious to X-rays and provided with a deep recess to receive the cathode stream entering said target, a cathode mounted in said tube to cooperate with said target, said tube being formed of a glass body surrounding said target and cathode, interceptors formed on said target to minimize the discharge of undesirable radiation therefrom and a window substantially transparent to X-rays mounted on said target through which the X-rays pass before striking the body of said tube.

6. An X-ray tube having a massive target of material substantially impervious to X-rays and provided with a deep recess to receive the cathode stream entering said target, a cathode mounted within said tube to coöperate with said target, intercepting means on said target to intercept undesirable radiation therefrom and a window substantially transparent to X-rays and impervious to undesirable radiation mounted

within said tube in the path of the useful X-rays before they strike the body of said tube.

7. An X-ray tube having a target, a cathode mounted within said tube to coöperate with said target, intercepting means mounted within said tube to intercept undesirable radiation from said target, and a window substantially transparent to X-rays mounted within said tube in the path of the useful X-rays before they strike the body of said tube.

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

JOSEPH ROSENTHAL.

Witnesses:

ULYSSES J. BYWATE,

MATHILDE K. HELD.