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A. O. ÅKERLUND

SCREEN FOR RÖNTGEN RAY EXAMINATION

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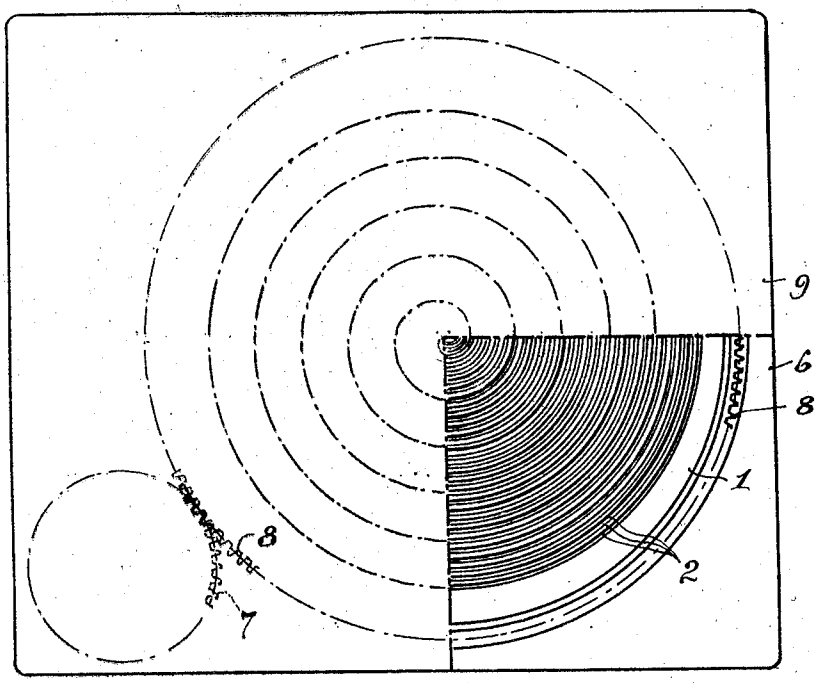


Fig. 1

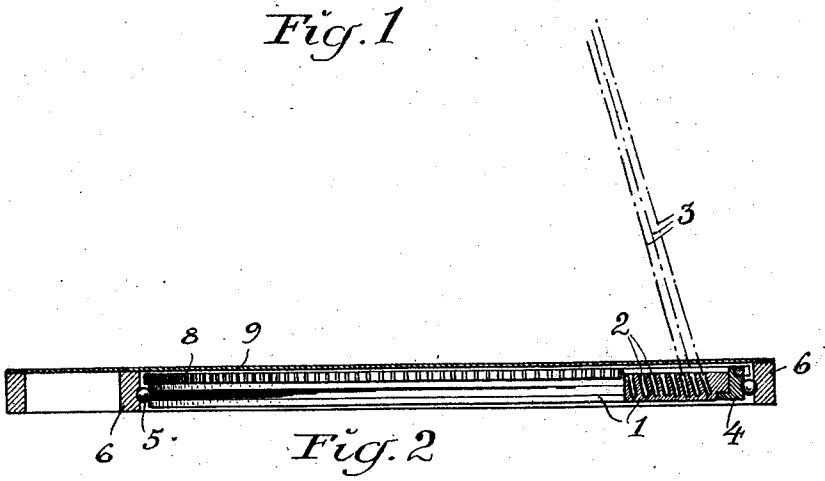


Fig. 2

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SCREEN FOR RÖNTGEN-RAY EXAMINATION.

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To all whom it may concern:

Be it known that I, ÅKE OLOF ÅKERLUND, a subject of the King of Sweden, residing at Kungsholms Hamnplan 3, Stockholm, Sweden, have invented certain new and useful Improvements in Screens for Röntgen-Ray Examination, of which the following is a specification.

For the examining of subjects by means of Röntgen-rays it is necessary to shut out the so called secondary Röntgen-rays in order to gain a clear image. For the said purpose screens are used, located between the subject to be examined and the photographic or fluoroscopic plate. The said screens generally consist of a plate made from a material permeable for the Röntgen-rays and provided with strips of laminæ of a material such as lead, which is opaque to the rays, the said strips being located in the permeable material and positioned in the direction of the primary rays in order not to obstruct the passage of the same. During the photographing operation the screen is moved slowly perpendicularly to the strips, so that the secondary rays, which otherwise contribute to rendering the image foggy, are partially shut out, without the strips, owing to the movement of the screen, effecting any shadows on the plate. It is evident, however, that secondary rays, which are substantially parallel to the longitudinal direction of the strips, are not shut out by the said arrangement. For removing the drawback just mentioned improvements have been proposed, the result of which, however, is not good owing to the fact that they are based upon a wrong principle in some or other respect. According to the said improvements the screens are provided with strips extending in different directions and thus crossing each, which results in the intersections of the strips, during the rotary motion generally imparted to the screen, effecting substantially ring-shaped images on the plate.

In order to gain a perfect picture from the body to be examined the screen, according to this invention, is provided with two or more spiral strips of metal or any other impermeable material provided in a carrier of suitable material and extending from the same centre parallel to each other.

A screen arranged in accordance with this invention is shown as an example in the accompanying drawing. Fig. 1 is an elevation of the screen and Fig. 2 shows a cross section of the same.

1 is a disk of a permeable material, such as wood. In a plurality of spiral grooves cut in the disk 1 strips 2 of an impermeable material such as lead are located. The grooves and consequently the spiral strips 2 coincide in direction with that of primary Röntgen-rays 3 emanating from a Röntgen-tube, as illustrated in Fig. 2. The disk which is enclosed by a metal ring 4 and carried by balls 5, running in a frame 6, is rotated by means of a toothed wheel 7 meshing with teeth 8 provided on the disk 1. The apparatus is covered by a plate 9 of aluminium or the like.

In order now to gain a uniform screening of the secondary Röntgen-rays from the centre of the disk to the periphery of the same all the spiral strips 2 extend from the centre of the disk, forming the same angles with each other, to the periphery of the disk parallel to each other, so that tangents to the strips at their intersections with the same arbitrary radius are parallel. The strips are located at the same distance from each other and the distance between the coils of each spiral strip is invariable from the centre of the disk to the periphery of the same. Preferably, the inner ends of the strips 1 are thinned to such a degree as is possible by technical means, so that all strips may extend as near the centre of the disk as possible and no part of the disk may be unscreened. During the photographing operation the disk 1 is rotated, so that the effecting of images of the strips is prevented.

The provision of a plurality of spiral strips arranged as stated above involves the advantage of the secondary rays in all directions being shut out, especially good Röntgen-pictures being thereby gained. As the coils of the strips are located at the same distances from each other, the rays passing through the screen are uniformly impaired throughout the plate, so that the latter is uniformly lighted. Owing to the fact that the strips are spiral and do not intersect and no radial strips are provided, shadowless pictures will be effected. In consequence of a plurality of strips located close to each other and extending from the same centre being used, the pitch of each spiral strip may be great without the efficiency of the

screen being reduced. Besides, the great pitch involves the advantage of each spiral strip greatly diverging from the circular path of each point of the same during the rotation of the disk, whereby the risk of ring-shaped shadows being effected on the plate is further reduced.

I claim.

1. In a rotatable screen for Röntgen-ray examination the combination of a carrier of a material permeable for the rays, and a plurality of substantially parallel spiral strips of an impermeable material, all extending from the same centre and having their planes coinciding in direction with that of the primary Röntgen-rays.

2. In a rotatable screen for Röntgen-ray examination the combination of a disk of a material permeable for the rays, and a plurality of parallel spiral strips of an impermeable material, which all extend from the same centre and the coils of which are located at the same distance from each other, the said strips having their planes coinciding in direction with that of the primary Röntgen-rays.

3. In a rotatable screen for Röntgen-ray examination the combination of a disk of a material permeable for the rays, and a plurality of parallel spiral strips of an impermeable material, all extending from the same centre and having their planes coinciding in direction with that of the primary Röntgen-rays, the inner ends of the said strips being thinned.

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

ÅKE OLOF ÅKERLUND.

Witnesses:

ROBERT APELGREN,

L. BERG V. LENDE.