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X-RAY TUBE SHIELD

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Fig. 1.

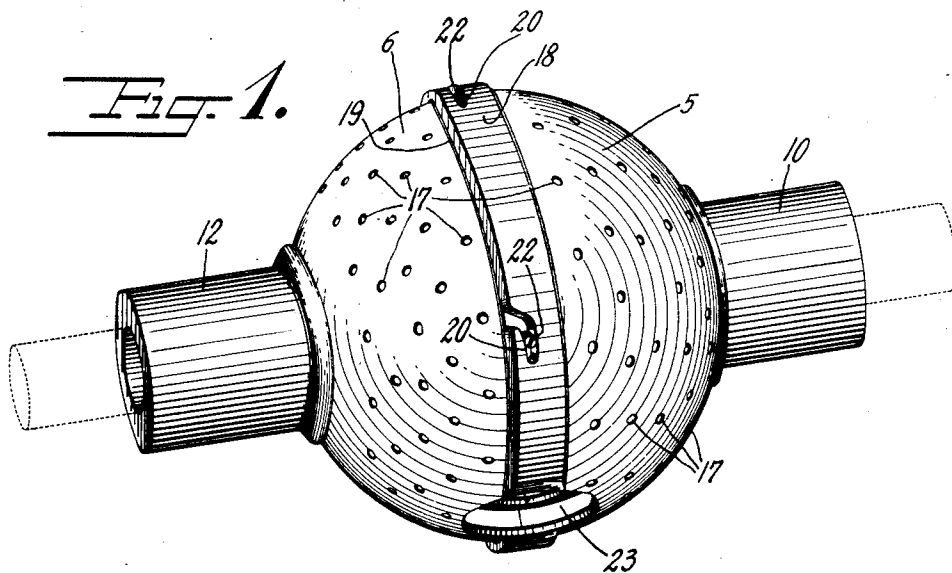
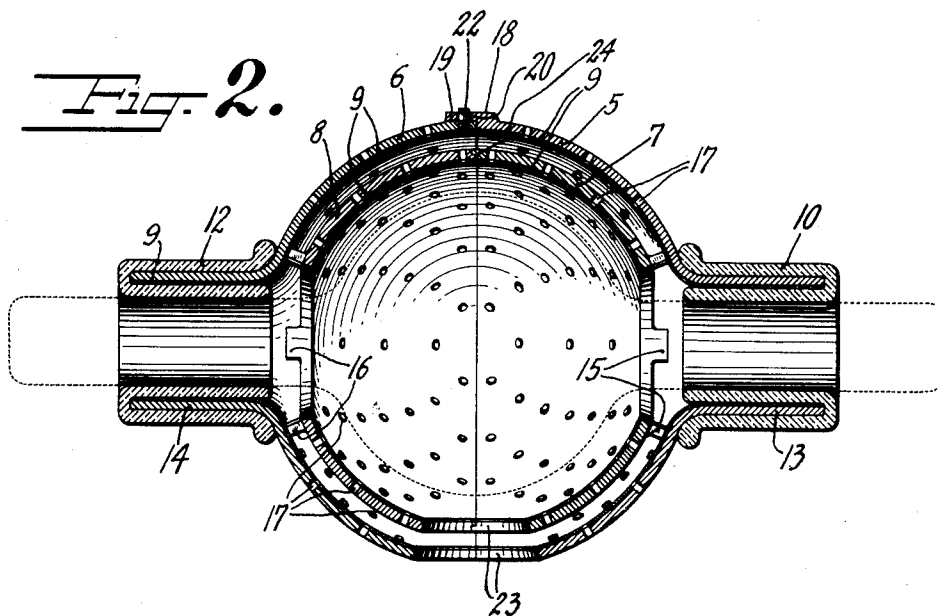


Fig. 2.



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X-RAY TUBE SHIELD

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Application March 23, 1932. Serial No. 600,611

8 Claims. (Cl. 250—34)

My invention relates to radiographic apparatus and particularly to a device for supporting and shielding an X-ray tube.

Heretofore in the art such devices have usually consisted of a lead glass bowl carried by a suitable support, in which the X-ray tube is properly supported and aligned with the object to be radiographed, while shielding X-rays from striking the operator or patient except at a desired area. Such devices, however, are very fragile and subject to breakage in operation due to expansion and contraction thereof caused by the heat emanating from the internally disposed X-ray tube. Moreover, these bowls, although X-ray opaque due to their lead glass composition, are not light opaque and under certain circumstances this causes considerable annoyance to both operator and patient.

X-ray tube shields which totally encase the tube are also well known to the art and are most commonly employed with fluoroscopic tubes. For this particular class of diagnostics the tube is disposed below a table or in the rear of a panel against which the patient rests during an examination. Such shields are likewise usually composed of lead glass coated in a suitable manner to render the same light opaque. This type of shield is, however, even more fragile than the aforementioned bowls because of the extreme heat to which they are subjected in totally enclosing the X-ray tube and the light opaque coating gradually becomes removed during operation of the tube necessitating frequent renewal.

It is an object of my invention to provide a shield which supports and shields the X-ray tube in such a manner that X-rays are prohibited from radiating therefrom except in a predetermined direction.

Another object of my invention is to provide a shield for supporting and shielding an X-ray tube which is light and ray opaque.

Another object of my invention is the provision of a shield for X-ray tubes which is not deleteriously affected by the heat generated by the tube.

Another object of my invention is to provide a shield for an X-ray tube which is light and ray opaque and in which the possibilities of cracking of the shield due to heat generated by the tube are substantially eliminated.

Another object of my invention is the provision of a shield for an X-ray tube which is readily detachable to render the tube accessible for replacement purposes.

A further object of my invention is the provision of a shield for X-ray tubes which is light

and ray opaque and in which provisions are made for the radiation of heat from the X-ray tube to the atmosphere.

Still further objects of my invention will become apparent to those skilled in the art by reference to the accompanying drawing in which

Figure 1 is a perspective view of my shield which is adapted to totally encase an X-ray tube; and

Figure 2 is a sectional view of the shield shown in Figure 1.

Referring now to the drawing in detail I have shown a pair of semi-spherical sections, each of which comprise an outer member 5 and 6 respectively, and an inner member 7 and 8 respectively. These members may be composed of a suitable phenolic condensation product, molded glass or any other suitable material.

In the preferred embodiment of my invention, however, I construct these members of suitable metal, such for example, as aluminum or thin steel and affix to their inner surfaces a ray opaque material 9 having a high atomic weight, such for example as lead. The outer members 5 and 6 although substantially semi-spherical in configuration are flared outwardly and provided with a suitable opening. Insulating bushings 10 and 12 respectively, provided with longitudinal slots 13 and 14 telescopically engage the outwardly flaring portions of the respective outer sections and thus form a cylinder with the exterior periphery of these bushings surrounding the exterior of the outer members 5 and 6 as well as the inner periphery of the flaring portions of the respective members.

The inner members 7 and 8 follow substantially the contour of the outer members 5 and 6 and are spaced from the outer members by means of suitable lugs 15 and 16 respectively, which also serve as supports. The inner members 7 and 8 are likewise provided with suitable openings coaxially aligned with the outwardly flaring portions of the openings of the outer member for the purpose of allowing the arms of an X-ray tube, such as shown in dotted lines in the figure, to pass therethrough and to be secured by the respective insulating bushings 10 and 12.

The outer members 5 and 6 of each section as well as the inner members 7 and 8 are each provided with a plurality of openings, such as shown at 17, for the purpose of allowing the radiation of heat from the interior of the shield and the X-ray tube to the atmosphere.

It is to be noted, however, that the openings 17 provided in the respective inner members 7

and have appeared relative to the opening 17
of the super member. This construc-
tion does emitting the free circulation of air
and thus the surface structure of the tube
is transparent, prevents the reflection of light
and the tube due to the fact that none of the
light is reflected back which would permit
it to be seen by the observer.

The following members are provided
General Order is furnished a badge and
which is attached by the collector member.
The two sections are secured through the
the I-see like suitable form such as
and provided in the form of a card in
the other manner & is provided with two
for the purpose of making the list so for
the record of the

[illegible][illegible]

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the work.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources and timeline needed to complete them.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the objectives are being met.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and identifying any lessons learned for future projects.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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[illegible]

and prevent the passage of light or X-rays therefrom.

3. An X-ray tube shield adapted to encase an X-ray tube comprising an outer metallic member having a configuration corresponding substantially to that of said X-ray tube and provided with openings therein and an inner metallic member of smaller size and configuration and spaced therefrom provided with openings therein, said openings in one of said members being staggered relative to the openings in the other of said members to permit the radiation of heat from said X-ray tube and prevent the passage of X-rays therefrom.

2. The shield was composed of two sections having an outer wall provided with openings therein, an inner wall and a wall between them and outer wall and provided with openings therein. The openings relative to the openings in said inner wall, and were connected with said openings for permitting the air to flow to the outer wall. The shield was

[illegible][illegible]

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals and identifying any areas for improvement.

[illegible]

THE FIRST OF THE FIVE