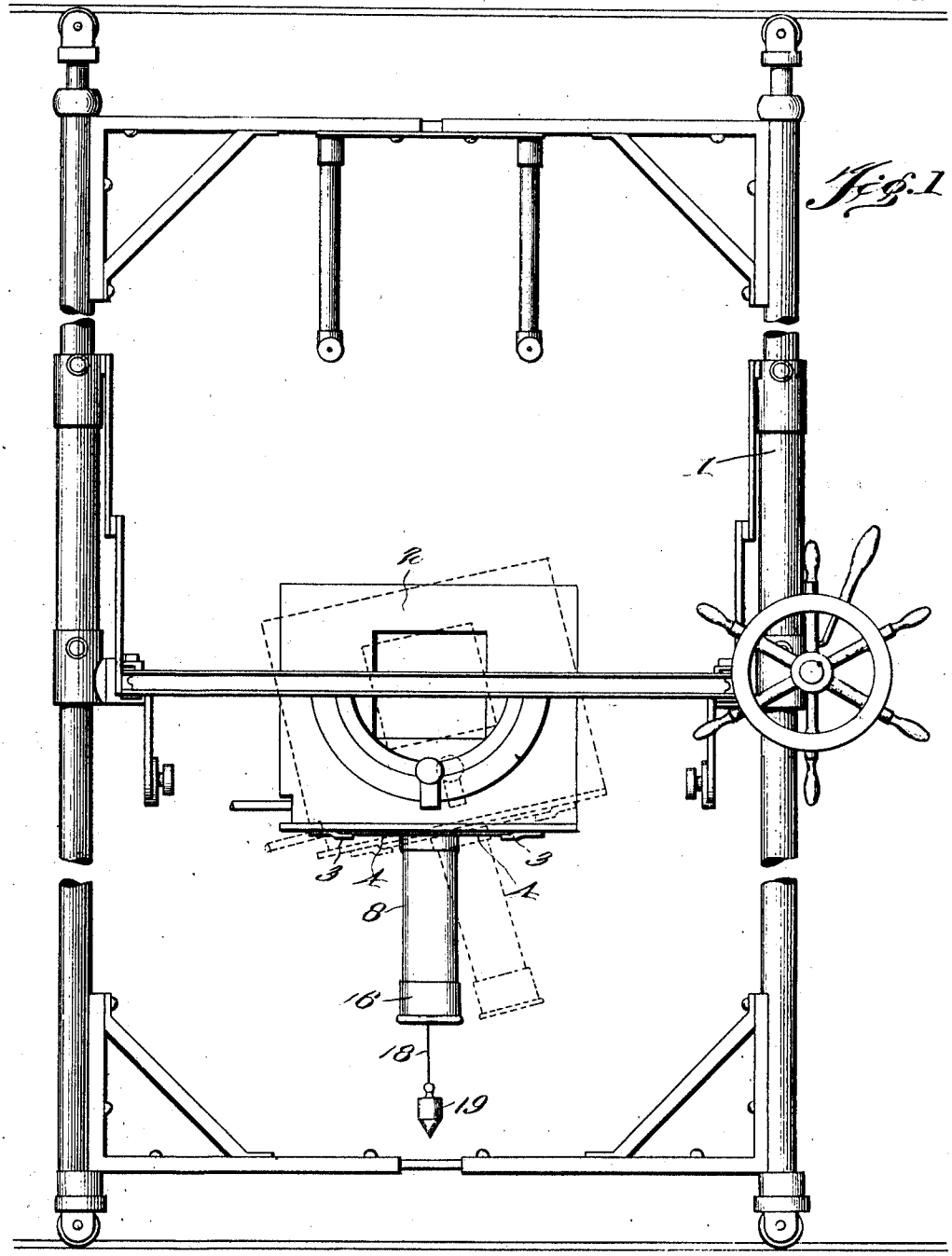
A. GRANGER.

X-RAY FINDER.

APPLICATION FILED SEPT. 19, 1911.

1,026,158. Patented May 14, 1912.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

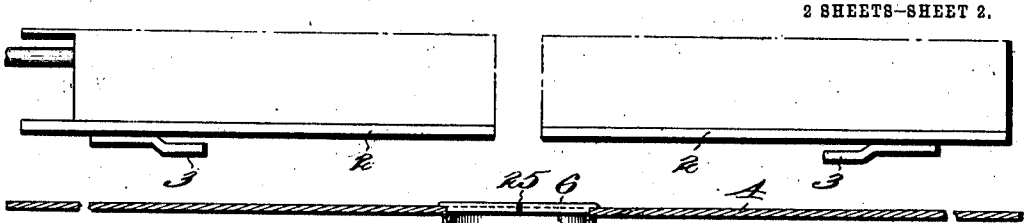


Fig. 2.

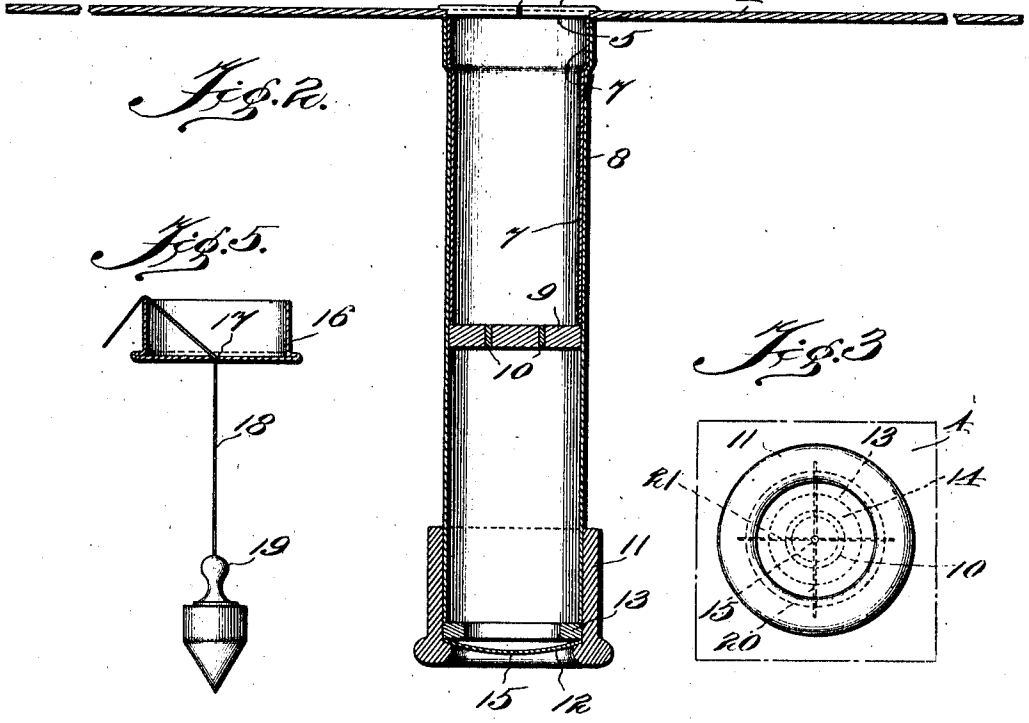
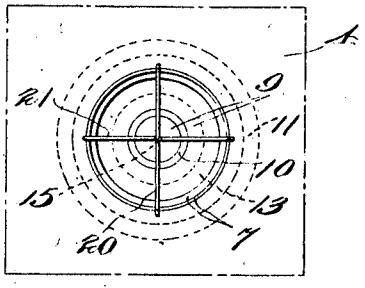


Fig. 5.

Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

AMÉDÉE GRANGER, OF NEW ORLEANS, LOUISIANA.

X-RAY FINDER.

1,026,158. Specification of Letters Patent. Patented May 14, 1912.

Application filed September 19, 1911. Serial No. 650,276.

To all whom it may concern:

Be it known that I, AMÉDÉE GRANGER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in X-Ray Finders, of which the following is a specification.

This invention relates to X-ray apparatus, and has for its object to produce a device which will enable the operator to find the normal X-ray, or ray of normal incidence with greater facility than has been heretofore possible, and also a device which will enable the operator to indicate the position of said normal ray during operations, treatments, or examinations, and one which will enable him to center or localize the said normal ray over any given point of a patient, fluorescent screen, or photographic plate.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claim.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a diagrammatic view of a portion of an X-ray apparatus fitted with my invention, Fig. 2 is an enlarged detail sectional view of my finder adapted to be used with the frame or mechanism illustrated in Fig. 1, Fig. 3 is a front view of my finder illustrating particularly the fluorescent screen with the shadows thereon, Fig. 4 is a rear view of my finder illustrating the metallic cross and metal rings, and Fig. 5 illustrates a cap and plumb bob adapted for use in connection with my finder as will appear more fully below.

1 indicates any suitable frame or mechanism adapted to hold and adjust the X-ray tube carried in any suitable support such as 2 and preferably of a box-like form, and 3 indicates brackets or other fastenings on said support adapted to accommodate a metallic plate 4. The said plate 4, as best illustrated in Fig. 2, is provided with a central circular opening 5 in which is centrally mounted a metal cross 6, and it is also provided with a short tubular extension 7 over which telescopes the longer tube 8 provided with the wooden or other non-metallic disk 9, in which fits the metallic ring 10 concentric with the said tube 8. A cap 11 adapted to fit over said tube 8 is provided with a fluorescent screen 12 and a metallic ring 13 also concentric with the tube 8, but of a diameter sufficiently large to leave an annular space 14 (see Fig. 3) between itself and the ring 10. The exact center of the fluorescent screen 12 is marked as at 15 by any suitable means, as for example by a perforation.

When the cap 11 is not in place over the tube 8, the cap 16 can be placed thereover for a purpose to be described below. Said cap 16 is preferably made of metal, and is provided with a central perforation 17 through which passes the cord 18 to which is attached the plumb bob 19.

In operation the plate 4, which may be of any size, or shape to fit the particular X-ray tube holder that may be employed, is suitably secured to said holder, as by slipping the same in between the brackets 3 on the support 2, and the X-rays are allowed to pass through the tubes 7 and 8, and to impinge upon the fluorescent screen 12. When thus functioning, the cone of rays will traverse the said tubes 7 and 8 and the central ray of normal incidence or normal X-ray of the cone will pass through the center of the metal cross 6, it will also pass through the center of the metal rings 10 and 13, and on the small fluorescent screen 12 will be seen the shadows of two dark lines 20 and 21 cast by the members of the cross 6, and the said lines will cross each other at the exact marked center 15, of the fluorescent screen 12 as indicated in Fig. 3. Further, the shadows of the two concentric rings 10 and 13 will also appear upon said screen 12. The centers of these shadows will correspond exactly to the point of intersection of the dark lines 20 and 21 when the normal ray takes the path indicated. On the other hand, should any other than the central or normal ray pass through the center of the finder, even though it be one of the least oblique of the rays owing to its inclination to the axes of the tubes 7 and 8, the intersecting dark lines 20 and 21 will no longer cross at exactly the center of the screen 12, nor will they longer be fine, sharp and distinct, as is the case when the central ray traverses the axes of said tubes, but the shadows of these said lines will be broad and hazy. Further, the shadows of the rings 10 and 13 will also be eccentric to each other in-

stead of concentric, whenever the normal ray is not passing through the center of the screen 12. Therefore, when the shadows on the screen indicate that the normal ray is not traversing the axes of the tubes, either the X-ray tube itself or else the parts of the finder are so adjusted until the shadows on the screen indicate that the normal ray does traverse the said axes of the tubes 7 and 8. When this adjustment of the parts is attained then the operator knows with certainty that the center 25 of the cross 6 lies in the path of the normal ray, and the tube 8 and cap 11 may be removed with the assurance that the shadows cast by the cross 6 in subsequent manipulations will indicate by the point 25 the path of the normal ray, and knowing this the said normal ray can be made to pass through any given point of the human anatomy, or fall upon any given point of a plate or fluorescent screen. With proper technique the operator is further enabled to either trace organs, or to locate foreign bodies hidden in the human anatomy.

When it is desired to focus the central or normal ray after finding it over any point of a table, patient, or plate, and when the plate 4 is in a horizontal position, as indicated in Fig. 1 and therefore lying over and in a plane parallel with the table, the tube 8 may be fitted in position as indicated in Figs. 1 and 2, and the cap 16 fitted thereover. In this position the plumb bob or weight 19 will indicate the passage of the central or normal ray. It therefore follows that the said weight 19 may be readily brought over the given point desired and the ray may be turned on with the assurance that it will reach the desired spot.

It will be observed that my finder is simple, absolutely accurate, it is small and light, and that it can be readily adapted, at small cost, for use with any of the X-ray holders or other apparatus that are now generally employed.

My apparatus further combines in one device a finder, indicator and localizer. Further, I regard the self-contained fluorescent screen as an important feature of my finder for it obviates the necessity of employing a larger and more cumbersome screen, which does not always leave the operator's two hands free to manipulate the X-ray tube or screen when finding the central or normal X-ray. This self-contained screen 12 also removes a common and possible source of error which attends the use of an independent fluorescent screen, because the latter is not always held exactly in the correct plane relative to the finder itself as is the self contained fixed screen 12.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claim.

What I claim is:—

In an X-ray apparatus having a box provided with an opening, the combination of a metal tube detachably supported coaxially about such opening for receiving a cone of X-rays, and a combined finder and indicator comprising a metal indicator supported on said box, and a metal ring and fluorescent screen carried by said detachable tube at a distance from said indicator to cooperate with the latter for locating the axial ray of such cone.

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

AMÉDÉE GRANGER.

Witnesses:
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A. J. GUESNON.