May 24, 1927.

P. A. ISHERWOOD

1,630,181

X-RAY APPARATUS

Filed Feb. 16, 1926

2 Sheets-Sheet 1

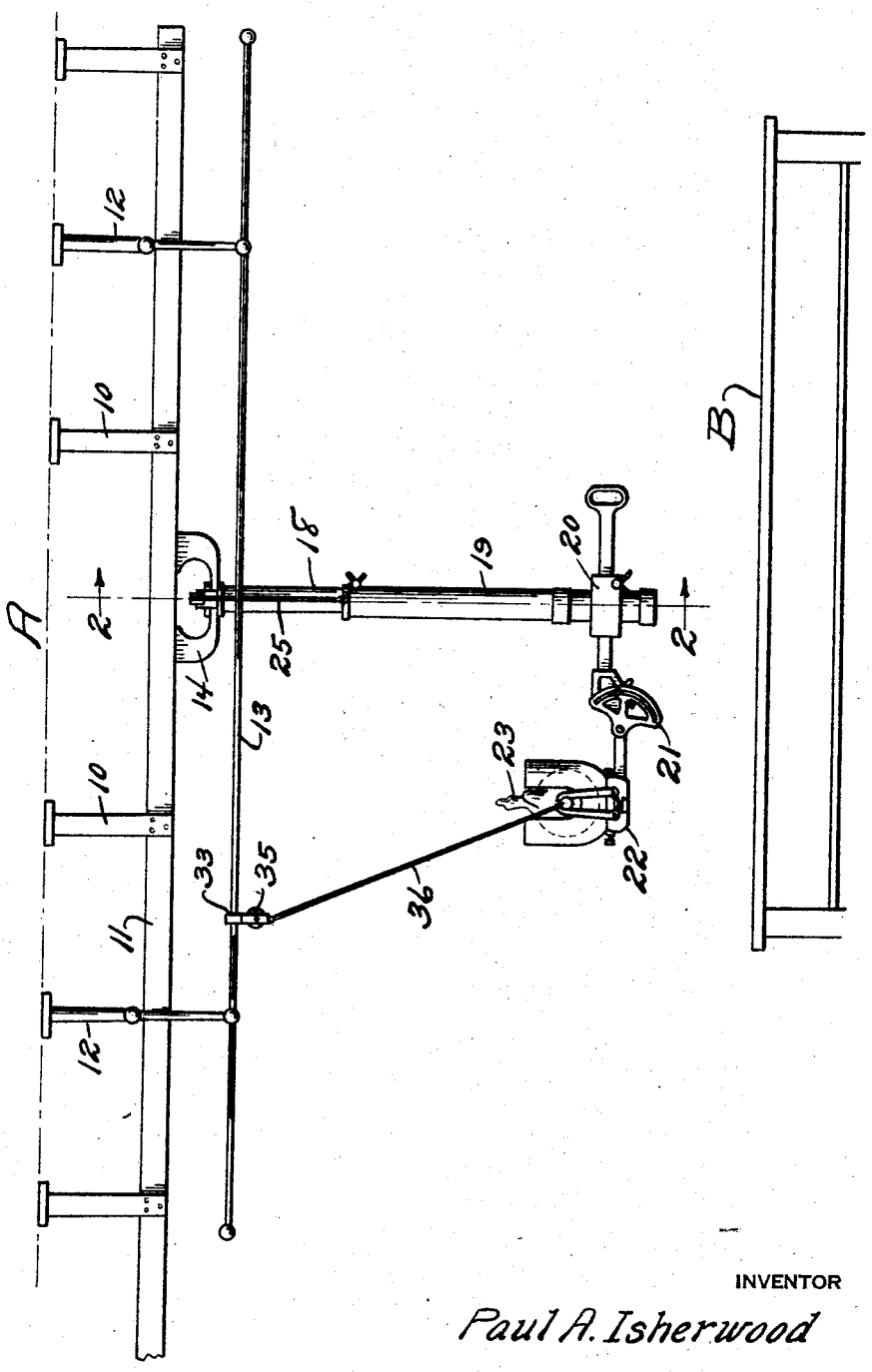


Fig. 1.

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Fig. 2.

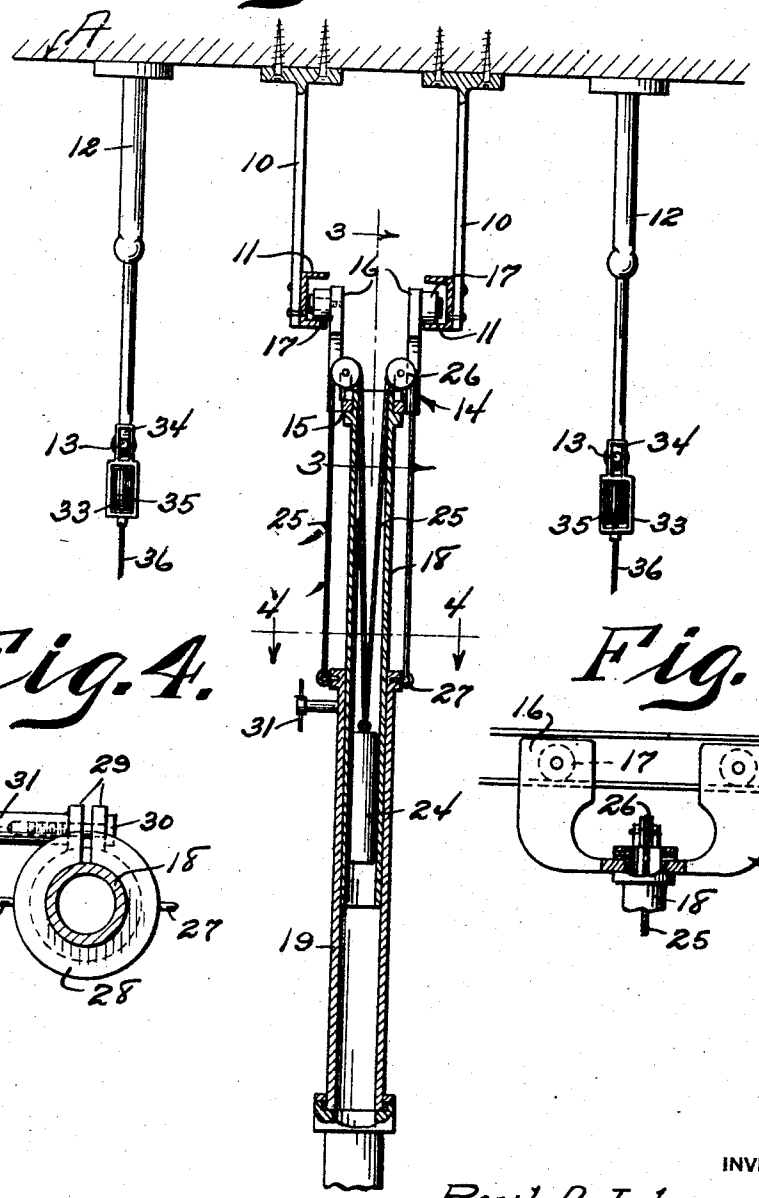


Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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X-RAY APPARATUS.

Application filed February 16, 1926. Serial No. 88,632.

This invention relates to an X-ray apparatus and has for its object the provision of novel means whereby an X-ray tube and the local support therefor may be mounted upon a carriage so that the X-ray device may be moved about so as to be disposed over a patient lying upon a wheeled cot or the like whenever it is necessary to take X-ray pictures or make exposures or examinations by means of a fluoroscopic screen or device.

An important object is to provide a device of this character which on account of its particular construction will make it far more comfortable for patients to be examined and X-rayed inasmuch as it will be unnecessary to remove them from the wheeled beds onto a table and then back onto the wheeled beds or cots, it being well known that these changes frequently cause what is known as surgical shock resulting in harmful consequences to the patient.

Another object of the invention is to provide a device of this character in which the conductors carrying current to the X-ray tube travel along trolley-like supporting elements so that current will be supplied to the X-ray tube regardless of the position thereof, it being conceivable however, that the conductors may be fixed, if desired.

Still another object is to provide an apparatus of this character in which the tube itself may be maintained in any desired height with respect to the table or bed upon which the patient is lying, and adequate adjustment means being provided for the purpose of permitting adjustment, the conductor or conductors being also connected with a take-up reel which will take in or pay out the conductor in accordance with the height of the tube itself.

An additional object is to provide a device of this character which will be comparatively simple and inexpensive in manufacture, easy to install and use, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the complete device.

Figure 2 is a vertical cross section taken on the line 2—2 of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 2, and

Figure 4 is a detail in cross section taken on the line 4—4 of Figure 2.

Referring more particularly to the drawings, the letter A designates an overhead support which may, in actual practice, be the ceiling of a room in which the X-ray device is to be used. Suitably secured to and depending from the ceiling A are bracket members 10 which are equipped with or which carry, at their lower ends, channel-like track members 11 arranged with their open sides toward each other as clearly indicated. Obviously, any desired number of the supports may be used for properly maintaining the channel-like track members 11 in the proper spaced relation and to give the necessary rigidity to the structure. Also secured to the underside of the support or ceiling A are depending bracket members 12 which support spaced parallel longitudinally extending horizontal rods 13 which constitute trolley members as will be hereinafter explained. Obviously, the supporting members or brackets 12 must be spaced a considerable distance apart inasmuch as it is not possible to move the trolley carriages to be described any farther than between the supports 12.

In conjunction with the above described track and trolley structure, I provide a carriage 14 which of course includes a suitable frame 15 here shown as provided with upstanding arms 16 carrying rollers 17 traveling upon the lower flanges of the channeled track members 11. This carriage further includes a depending outer tubular member 18 upon which is telescopically engaged a tubular member 19 carrying a supporting device 20 upon which is adjustably mounted, as by means of the slotted segment 21, a bracket device 22 which carries the X-ray tube itself indicated at 23. Obviously, any suitable shield may be provided in connection with this X-ray tube, and as such forms no part of the present invention, details thereof are not disclosed. In order to counterbalance the weight of the parts, I provide a weight 24 slidably mounted within the tubular

member 18 and having connected therewith a pair of flexible members 25 which are trained over guide pulleys 26 journaled upon the carriage 14 as clearly indicated, the other ends of these flexible members being connected with suitable securing elements such as screw eyes or the like 27 located at the upper end of the tubular member 19.

In case it is desired to clamp the vertical support formed by the members 18 and 19 in fixed relation, I provide a split collar 28 arranged in encircling relation to the member 19 and having terminal ears 29 through which passes a clamping bolt 30 upon which is engaged a nut-like member 31 equipped with a hand wheel 32. Obviously, by tightening this nut member 31 the frictional resistance will be such that the tubular member 19 cannot move with respect to the tubular member 18. This adjustment is resorted to when a patient is brought in as for instance upon a cot or table indicated at B and placed beneath the device for the purpose of having X-ray photographs taken.

It is of course obvious that current must be supplied to the X-ray tube 23, and for this purpose it is intended that the trolley members 13 be connected with a suitable supply or source of current. Slidably or fixedly mounted upon the members 13 are carriages 33. If movable they are equipped with suitable rollers 34 travelling upon the trolley members 13. Journally supported within the carriages 33 are spring drums 35 to which are secured and about which are trained flexible members 36 which are of course formed as conductors and which are connected with the respective terminals of the X-ray tube.

In the operation of the device, it will be readily apparent that whenever it is necessary to raise or lower the X-ray tube itself, it is merely necessary that the operator push or pull upon the carriage or support device 20 at the lower end of the member 19 which telescopes the member 18. Owing to the provision of the counter-balancing weight 24, it will be quite apparent that this movement in either direction will be readily effected and when adjustment is accomplished the parts will remain in adjusted position even though the clamping screw or nut member 31 is not touched. However, in case of necessity, the operator may turn the hand wheel 32 and tighten the nut member 31 so as to contract the band 28 about the member 19 and hold the same rigid with respect to the member 18. Of course, as the tube carrier is moved up and down it is necessary that the flexible members 36 acting as conductors for the current thereto must adjust themselves and the spring rollers 35 mounted in the carriages 13 will permit of this action inasmuch as any slack in the flexible members 36 will be automatically taken up when the tube is lowered and any extension permitted when the tube is moved in the other direction. It is really believed that the construction, operation and advantages will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the preferred embodiment of the invention, it should be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:—

1. In an X-ray apparatus, an elevated trackway comprising a pair of spaced channeled rail members arranged in confronting relation, a carriage having rollers on the outer sides thereof travelling along said rails, said carriage including a depending cylindrical hollow member stationarily mounted with respect thereto, a tubular member telescopically engaged exteriorly upon said first named tubular member and provided with means for supporting an X-ray tube, said second named tubular member being vertically adjustable with respect to the first named for varying the height of the X-ray tube, trolley wires located at opposite sides of said trackway, carriages movably mounted along said trolley wires, and conductors connected with said last named carriages and with the terminals of the X-ray tube.

2. In a device of the character described, an elevated trackway including a pair of spaced rails, a carriage equipped with rollers travelling along said rails, said carriage including a relatively stationary vertically arranged tube, a tubular member telescopically engaged with said first named tubular member, means on the second named tubular member for carrying an X-ray tube, pulleys mounted on said carriage, flexible members connected with the second named tubular member and trained over said pulleys, a weight slidable within the first named tubular member and connected with the flexible members for counterbalancing the weight of the X-ray tube and its mounting, a pair of trolley wires, and current collectors movably mounted along the trolley wires and connected with the terminals of the X-ray tube.

In testimony whereof I affix my signature.

PAUL A. ISHERWOOD.