

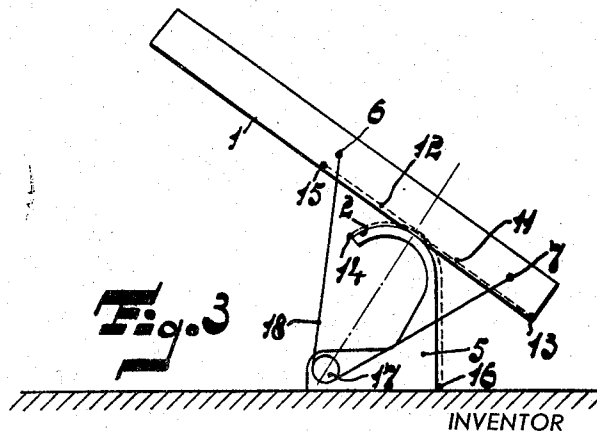
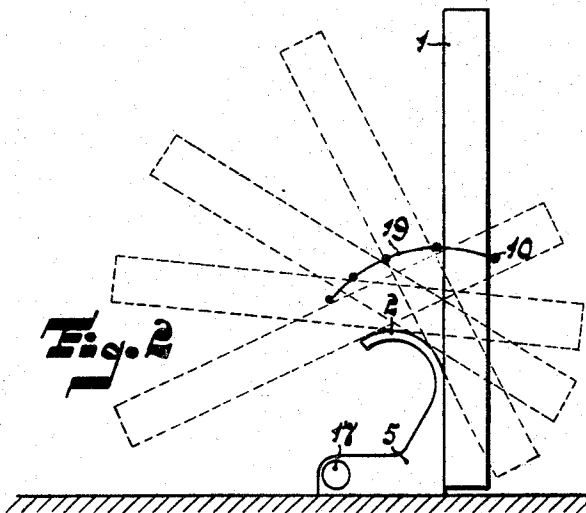
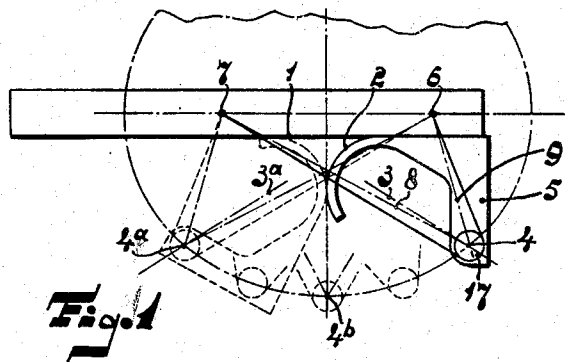
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TILTING X-RAY MEDICAL EXAMINATION TABLE

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TILTING X-RAY MEDICAL EXAMINATION TABLE

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1 Claim. (Cl. 311-6)

This invention relates to a table utilized in X-ray medical examinations.

For medical examination by means of X-rays supporting tables are available in which the position of the supporting surface for the patient is varied by rotating the table top about a horizontal axis. The table top must be capable of being arranged not only horizontally but also vertically and must be capable of assuming intermediate positions. In addition, it is desirable for the top to be adapted to be inclined to the other side also so that the top must be capable of rotation through an angle of altogether at least 110°.

In a usual arrangement the table top is rotated from the horizontal into the vertical position about an axis lying between the center and one of the ends.

This construction follows from the condition that the height of the supporting surface above the floor must not exceed a predetermined value and the half length of the table top generally exceeds this value. If the axis of rotation should lie in the middle of the table top, several advantages would be obtained. The construction can be lighter and less material is required. Such a device could be manufactured cheaper if the realization of the symmetrical arrangement would not entail complications. The difference between the half length of the top and the height of the supporting surface above the floor requires the table top to shift longitudinally also during rotation.

The structural parts used in different tables to permit the table top to be fixed in any desired position and which also cooperate with the driving members to effect the rotary movement of the table top due to their weight increase the mass of the parts required to be moved. In addition to the known semi-circular discs which are secured to the table top and are driven along their circumference use has been made of rods to revolve the table top. Although the last-mentioned embodiment increases the weight of the table top to a lesser extent, in practice the first-mentioned manner of driving the table top is used almost exclusively.

It is an object of the invention to restrict the weight of the moving parts of a supporting table to a minimum and also to reduce the inertia forces in other respects. The present invention permits the symmetrical arrangement in which these forces are reduced to a minimum to be approximated. According to the invention the table top is rotatable without shifting along a curved surface of a supporting base. In addition, use is made of flexible pulling means to connect a rotary disc arranged in the base and driven by a driving mechanism to the table top at two points of application lying on either side of the point at which the contact surface of the table top rests upon the curved surface of the base. The said connecting means may be chains. To prevent the table top from shifting when it is revolved about the curved surface use may be made of steel tapes or similar connecting means which from both ends of the table top are slung over the curved surface of the base and on either side

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thereof are firmly attached. A groove and bead connection by means of which the surfaces of contact of the table top and the rounded base-head engage each other prevents the table top from being displaced transversely.

The above and other features, objects and advantages of the present invention will be fully understood from the following description considered in connection with the accompanying illustrative drawings.

Fig. 1 is a diagrammatic view of the X-ray table arrangement embodying the present invention,

Figs. 2 and 3 are diagrammatic views of alternate embodiments of the present invention.

The construction is based on recognition of the fact that two curves determined by different equations may partly coincide upon a proper choice of some dimensions. This will be illustrated in Fig. 1 of the drawing.

Referring more particularly to Figure 1 the numeral 1 designates the table top and 2 a surface of the base 5 which is circularly curved about a point 3 and along which the table top can rotate. If this movement is considered as a rotation of the base with respect to the table top, the center 3 of the curved surface 2 is seen to move to 3^a along a straight line. The base comprises a disc 17 which is rotatable about the center 4. This moves to 4^a along part of a cycloid upon rotation of the table. It is supposed that this movement is such that the distance of the point 4^a relatively to the table top 1 is equal to that of the point 4. This cycloid is determined by the radius of the circle 2 and the distance between the points 3 and 4.

The point 4 is connected to two points 6 and 7 of the table top 1 in that a belt rope or chain attached at these points is arranged over a rotary disc 17. Consequently point 4 must also describe an ellipse of which the lines 8 and 9 are the radius vectors. It is possible to construct an ellipse which has the points 4 and 4^a and the apex 4^b in common with the cycloid described above by a proper choice of the joining line 6-7. The foci 6 and 7 follow from this construction. It has been found possible for the position of the joining line to be arranged so that the two curves are substantially coincident along the distance covered by the angle of rotation of a value of 110°. Furthermore, upon a proper choice of the dimensions the deviation is found to be so small that it can easily be obviated by the use of a rotary disc which is arranged resiliently.

This leads to the arrangement shown diagrammatically in Fig. 2. In this figure the table top is shown in different positions and in addition the points are indicated at which the center of gravity 10 of the table top carrying a patient is located in each of the positions. When the top 1 is rotated along the surface 2, the center of gravity 10 moves along the indicated curve 19. From this it will be seen that the difference of height described by the center of gravity in a complete rotation is very slight and much smaller than if the top rotates about a stationary axis consequently the energy required to rotate the table top can also be less.

Since the radius of the surface 2 is greater the symmetrical arrangement is approximated. However, the increase of this dimension cannot be pushed too far since this causes the stability of the table top 1 to decrease as it approximates to its vertical position. In addition, the increase of the curvature of the cycloidal course of the point 4 causes the distance between the points 6 and 7 in which the connecting means of the table top 1 are attached to decrease with a resultant decrease of the stability. Consequently the radius must be made as large as possible but not too large, for example not exceeding one half of the height of the space available below the table top in its horizontal position.

The most advantageous arrangement of the rotary disc is at as small as possible a height above the floor on the

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line bisecting the angle of rotation. In this case it is spaced from the table top by a maximum distance and it describes a symmetrical course relatively thereto.

Fig. 3 shows the arrangement of the table top 1 on the base 5 and the means preventing the table top from shifting relatively to the curved surface 2. These means are in the form of flexible tapes 11 and 12 made, for example, of steel. One of these tapes is attached to the table top 1 at 13 and to the base 5 at 14. Tape 11 connects to the point 15 at one end of the table top 1 and tape 12 connects at one of its ends to the point 16 of the base 5. The rotary disc is designated 17. It acts as a driving member for the tape or chain 18 attached to the table top 1 at the two points 6 and 7. Rotation of the disc 17 causes the position of the table top to vary. For this purpose a driving mechanism built into the base may be used which is actuated by hand or by means of an electric motor.

While I have shown and described the preferred embodiment of my invention, it will be understood that the latter may be embodied otherwise than as herein specifically illustrated or described and that in the illustrated embodiment certain changes in the details of construction and in the arrangement of parts may be made without departing from the underlying idea or principle of the invention within the scope of the appended claim.

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What is claimed is:

An X-ray medical examination table comprising a base having at least one curved surface, a table top rotatable on said curved surface, the radius of said curved surface not exceeding $\frac{1}{2}$ the height measured from the bottom of said base to the bottom surface of said table top, a rotating disc, means mounting said disc on said base, and connecting means comprising at least one flexible tape fixed to points at opposite ends of said base and engaging said curved surface and said table top, and another flexible tape secured at both ends to spaced points on said table top, a part of the intermediate portion of said other flexible tape being passed around and in engagement with said disc.

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