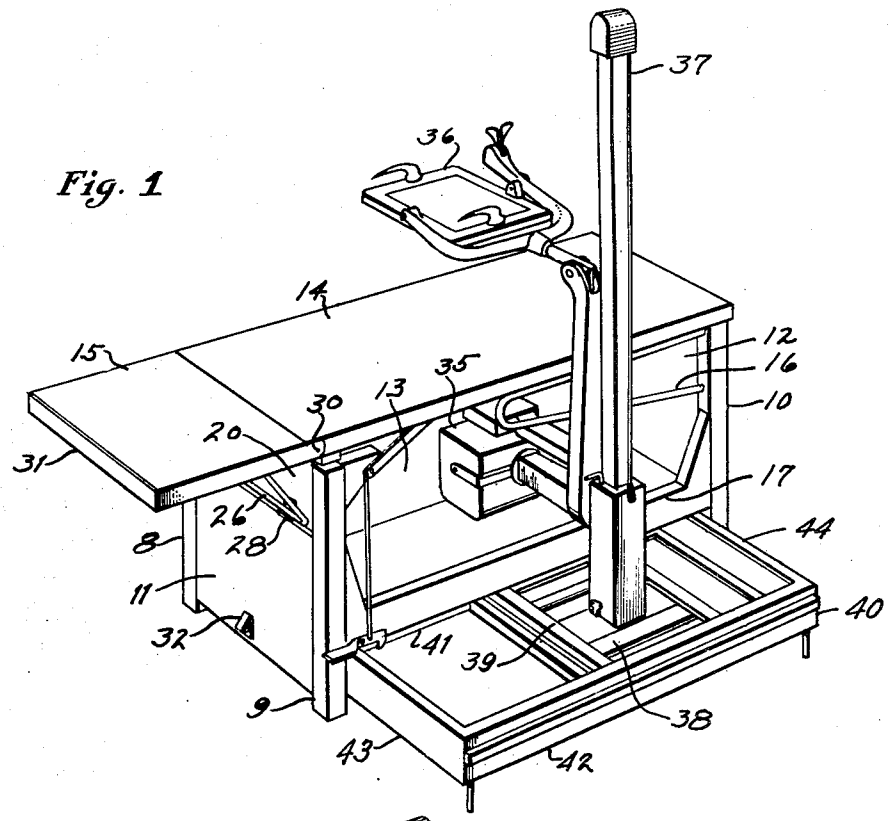
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TILTABLY X-RAY TABLE WITH EXTENSION PANEL

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Fig. 1



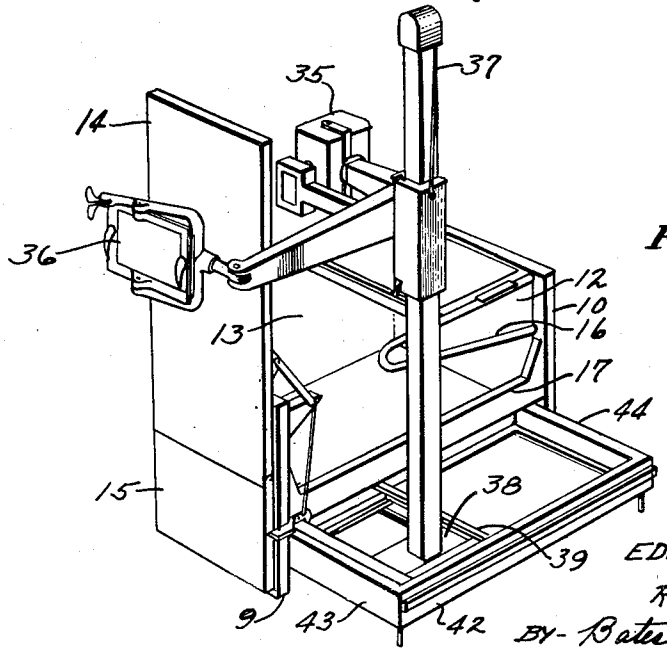


Fig. 2

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TILTABLY X-RAY TABLE WITH EXTENSION PANEL

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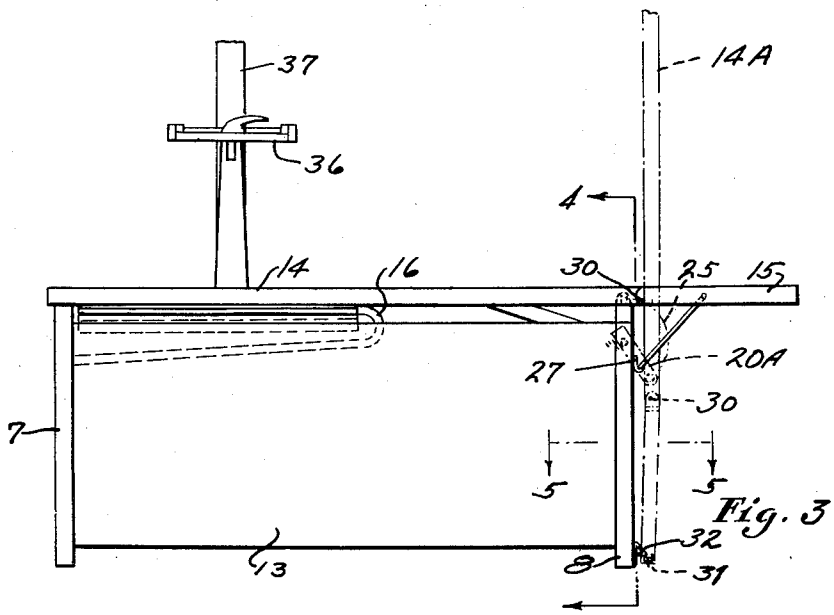


Fig. 3

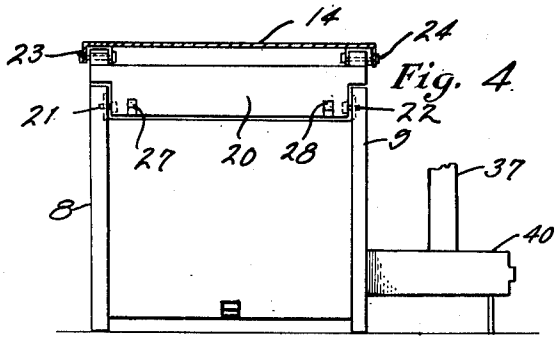
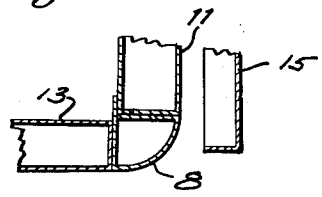


Fig. 4

Fig 5



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TILTABLY X-RAY TABLE WITH EXTENSION PANEL

Original Filed May 27, 1949 3 Sheets-Sheet 3

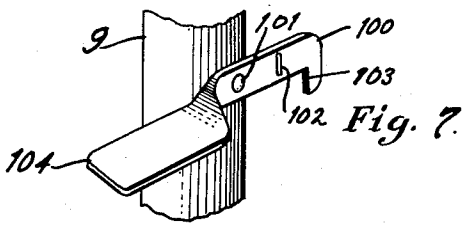
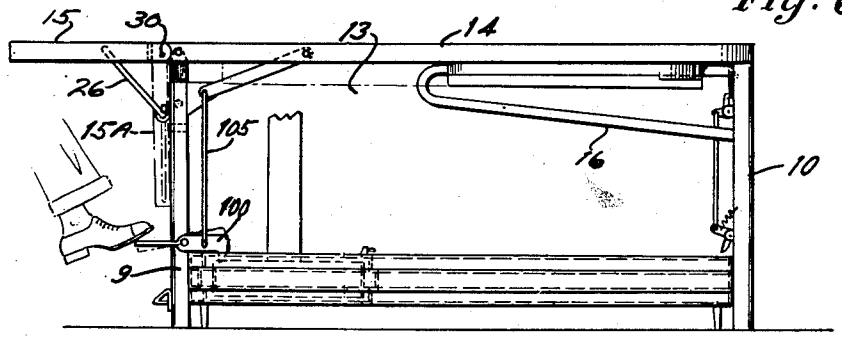


Fig. 7

Fig. 6



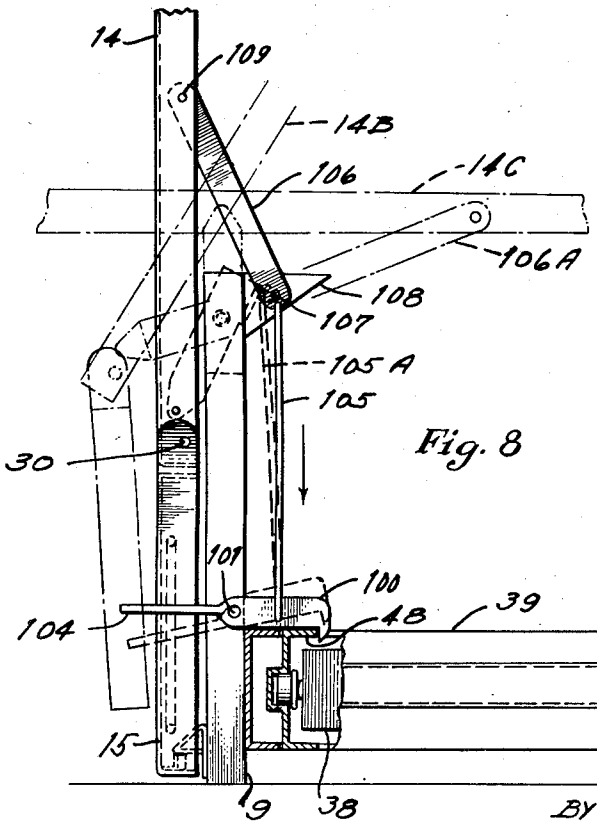


Fig. 8

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2,707,662

TILTABLY X-RAY TABLE WITH EXTENSION PANEL

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Original application May 27, 1949, Serial No. 95,684. Divided and this application November 14, 1950, Serial No. 195,654

1 Claim. (Cl. 311—6)

This invention relates to X-ray apparatus of the tilting table type, such as is used for radiography and fluoroscopy. This application is a division of our co-pending application, Serial No. 95,684, filed May 27, 1949, now U. S. Patent No. 2,668,912 for X-ray Apparatus.

An object of the present invention is to simplify X-ray apparatus by reduction in cost and weight, while still retaining the advantages of the more complicated or costly apparatus. In this connection, the invention contemplates an arrangement for attaining a compact structure that is light in weight and is capable of being readily moved and manipulated without imposing undue strains upon the operator. The invention also includes a construction which eliminates the necessity for a heavy counterweight heretofore used on the tilting table type of apparatus.

An additional object is to provide means for automatically locking the table top in vertical position, and to provide a table top which is adapted for use with horizontal and vertical fluoroscopy.

In the drawings, Figure 1 is a perspective view illustrating the table in horizontal position with the tube beneath the table top, and the screen unit above the table top; Fig. 2 is a perspective view showing the table top in vertical position with the tube positioned behind the table top, and the screen unit positioned in front of the table top; Fig. 3 is a side elevation of the table; Fig. 4 is a section taken on a plane indicated by the line 4—4 in Fig. 3; Fig. 5 is a section taken on a plane indicated by the line 5—5 in Fig. 3; Fig. 6 is a side elevation of the table taken from the side opposite to that shown in Fig. 3; Fig. 7 is a perspective view illustrating a locking lever that is used for holding the tube stand carriage in a definite position with respect to the table when the table top is tilted to a vertical position; Fig. 8 is a side elevation, partly in section, showing the mechanism for holding the table top in vertical position.

The apparatus shown in the drawings comprises a table having legs 7, 8, 9 and 10, end panels 11 and 12, a side panel 13, a top 14 and an extension panel 15 for the top. The side opposite the panel 13 is open except for a Bucky track in the form of a U-shaped bar or tube 16, the ends of which are securely fastened to the leg 10. The track 16 terminates short of the length of the table so as to provide a well through which the tube supporting arm can be moved so as to change the tube from a position beneath the table to one above the table, as is shown for example, in Figs. 1 and 2 respectively. In addition to the Bucky track, the open side of the table has a beam 17 extending lengthwise thereof, and rigidly connected to the legs 9 and 10 and spaced about the bottom portion of the panels 11 and 12.

The table top is adapted for use with horizontal and vertical fluoroscopy and accordingly, the top is hinged at one end for movement from the position shown in Fig. 1 to that of Fig. 2. The hinge construction is so arranged as to flatten the arc made by the free end of the table over

that which would be made if the top were hinged directly to the table legs. The purpose of such construction is to avoid striking any part of the tube unit or screen unit, without necessitating the use of a column that extends to an objectionable height above the table. A preferred hinge construction embodies a plate 20, which extends across one end of the table and is pivoted to the legs 8 and 9 at 21 and 22 respectively (Fig. 4). The upper portion of the plate is connected by aligned pivots 23 and 24 to the table top and the arrangement is such that the plate is substantially vertical whenever the table top is in horizontal position. When the table top is in the vertical position, indicated at 14A of Fig. 3, the plate 20 will be in a position shown by the broken lines 20A of Fig. 3. Thus, as the table is tilted the axis of its pivotal connection to the plate moves outwardly and downwardly, following the path indicated by the arc 25 in Fig. 3. The result of such action is to flatten the arc made by the free end of the table, as stated aforesaid.

When the table top is in horizontal position, the extension panel 15 may be disposed in co-planar relationship thereto, as is shown in Figs. 1 and 3, and may be so held by means of a bail 26, the ends of which are pivotally connected to the extension, and the intermediate portion of which rests within hook-shaped brackets 27 and 28 (Fig. 4) on the lower end of the plate 20. In addition to the foregoing position, the extension panel may be swung downwardly to the position shown by the broken lines 15A in Fig. 6 by merely lifting the bail out of engagement with the hooks and allowing the panel to drop.

When the table top is swung to vertical position, the panel operates automatically to lock and hold it in such position. This is accomplished by positioning the extension panel pivot 30 off-center with respect to the table top flange so that the panel will swing inwardly by gravity toward the panel 11 until the flange 31 thereon (Fig. 3) underhangs an abutment 32 which is attached to the panel 11 adjacent the bottom thereof. Inasmuch as the initial movement for lowering the table top necessitates an outward and upward movement of the pivots 23 and 24, the table top is effectively locked in vertical position until the panel 15 is manually swung out of the path of the abutment.

Cooperating with the table are the usual X-ray tube unit 35 and fluoroscopic screen 36 which are mounted either for conjoint or independent use depending upon whether the operation is fluoroscopic or radiographic. A single X-ray tube suffices for either operation, and the mounting is such as to permit the tube to be positioned either above or below the table whenever the table is horizontal, and to be positioned behind the table whenever the top is exposed in vertical position.

The supporting mechanism for the tube stand and the screen unit includes a column 37 which is disposed at one side of the table and is supported for movement longitudinally and transversely of the table. To this end, the column is rigidly attached to a sub-carriage, indicated in general at 38, which is mounted for movement transversely of the table within a main carriage 39, the latter of which is mounted for movement longitudinally for the table within a stationary frame, indicated in general at 40. The frame is rigidly fastened to the under structure of the table, and embodies an open rectangular structure having longitudinally extending beams 41 and 42 which are connected by end beams 43 and 44 respectively. Thus the column and its supported structures may be moved either longitudinally or transversely of the table in accordance with the various positions required for the tube and screen units respectively.

Whenever the apparatus is used for vertical fluoroscopy, it is desirable to lock the tube stand and its associated mechanism in a predetermined position with respect to

the vertical table top. This may be accomplished by utilizing a foot operated latch **100** which is pivotally connected to the table leg **9** at **101**. The latch has a finger **103** for engaging behind the top flange of the side rail **48** on the main carriage, and has a slot **102** therein for receiving the inturned lower end of the rod **105**. The upper end of the rod extends into an opening in a link **106** while the link, in turn, is pivotally connected at **107** to a bracket **108** which is fixed to the table leg **9**. The other end of the link is pivotally connected at **109** to the table top.

The full line position of Fig. 8 shows the carriage **39** locked to the table frame and illustrates the vertical position of the table top, while the broken line position **14B** indicates the intermediate position, and the broken line **14C** indicates the horizontal position. The connection between the rod **105** and the link **106** is off-center with respect to the pivot **107**, wherefore, as the link is moved, from the full line position of Fig. 8 to the broken line position of **106A**, the rod **105** is moved to the broken line position **105A**, and the latch **100** is lifted automatically sufficiently to clear the carriage **39**. Thus, when the table top is horizontal, the carriage may be freely moved without restriction of the latch, but when the table top is vertical, the latch is in position to hold the carriage. However, the exertion of pressure upon the foot engaging portion **104** enables the latch to be raised and releases the carriage **39**, whenever desired, for movement of the carriage towards the opposite end of the table.

An X-ray apparatus made in accordance with the foregoing description is operative to permit use of the unit for fluoroscopy, or radiography, with the table top in horizontal position in Fig. 1, and is also suitable for vertical fluoroscopy as is indicated in Fig. 2. The various movements required for transposing the tube and screen units can be accomplished without interfering with the tilting of the table, thus resulting in a compact structure which is light in weight and which is substantially fool-proof in its operation.

We claim:

In an X-ray apparatus having a table top adapted to be positioned in either a horizontal or a vertical position, upstanding supports for opposite ends of the table top, the top portion of one of said end supports having a separate upstanding plate extending across the corresponding end of the table top and having its top edge coacting in the same horizontal plane with the top of said other end support to support the table top in horizontal position thereon, a fixed pivotal connection between said one end support and the lower portion of said plate, another pivotal connection between the upper portion of said plate and the corresponding end of the table top, said plate coacting between the pivotal connections to permit tilting of the table top through a flattened arc into vertical position adjacent said one end support, an extension panel pivotally connected to the pivoted end of the table top and in off center relation towards said one end support with respect to the table top pivot, and means at the base of said one end support for engaging the extremity of said panel when the table top and panel are positioned vertically, said means coacting with the plate in such position to prevent lowering of the table top and panel until externally released.

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