

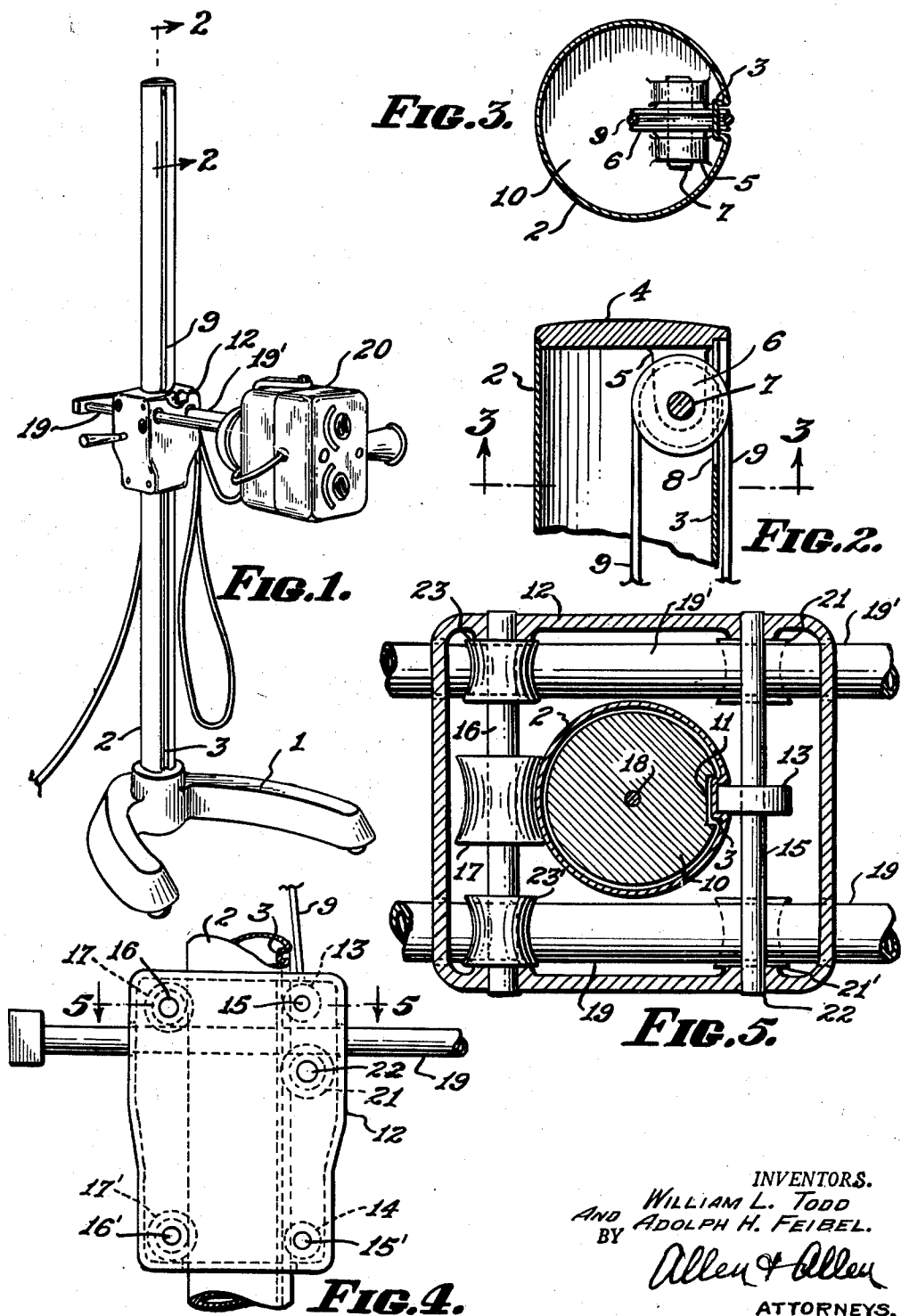
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W. L. TODD ET AL

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X-RAY EQUIPMENT MOUNTING COLUMN

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INVENTORS.
WILLIAM L. TODD
AND ADOLPH H. FEIBEL.
BY
Allen & Allen
ATTORNEYS.

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X-RAY EQUIPMENT MOUNTING COLUMN

William L. Todd, New Smyrna Beach, Fla., and
Adolph H. Feibel, Cincinnati, Ohio, assignors to
The Kelley-Koett Manufacturing Co., Covington,
Ky., a corporation of Ohio

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The invention relates to devices for supporting the adjustable X-ray apparatus which is employed for treatment of patients, fluoroscopy, radiography and the like. X-ray generators are heavy and the various supporting elements for the same, for screens or plate holders appended thereto, and for devices for locating the patient with respect thereto, all make up structures which must be safely supported for vertical movement on a standard or column or group of columns, as well as counterweighted and well guided, so as to be easy to manipulate accurately.

The accepted mode of providing a standard for such apparatus is to use one or more hollow standing tubes on a suitable base, locate a counterweight within each tube, and to guide the X-ray apparatus on the tubular column or columns by means of projecting ribs or strips on the column. The cable to the counterweight in such cases passes over a pulley held in an overhanging portion of a cap located on the tubular column.

It is undesirable to have cables which pass up in spaced relation to the column, which is necessary in such constructions. It is not as safe as it might be to locate the pulley for the counterweight cable in the projection of a cap on the top of the tube, because this cap may become dislodged and permit the X-ray apparatus to drop a short distance and possibly injure a patient. For best operation and longest life of a cable it is not desirable to expose it to the twisting action of a counterweight which can rotate within the tubular column. Should a counterweight become loose or a cable break, the heavy apparatus might well fall on a patient. For smooth well guided movement of the mounting piece for the X-ray unit on the column, the present mode of mounting is not fully effective.

The object of our invention is to provide for a simple and improved mounting in which instead of a projecting rib serving as a guide along a tubular supporting column, the column is formed with a longitudinal channel in it, and rollers on the X-ray unit travel in this channel. In such a construction the counterweight is shaped to the inside of the tubular column, i. e., it has a groove in it to guide over the inwardly projecting rib resulting from forming the external channel in the column. In such a construction the counterweight cable can be located mainly within the channel of the column and the cable pulley in the top of the column may be mounted on depending arms on the column cap which lie within the top of the column with the pulley only exposed in the upper end of the vertical channel.

By these modifications over the accepted

mounting practice, we have, as will be observed, provided a practical and inexpensive solution that avoids the difficulties of past constructions, and in addition brings the traveling head closer to the column giving a neater appearance. Because the channel can be formed by rolling a groove into a piece of tubing, there are no cracks or fissures in the face of the column as are present with the superimposed guiding ribs of present day apparatus.

We have illustrated our invention as applied to a single column support. It is equally applicable to two column or four column supports and indeed wherever a counterweighted piece of apparatus is movably mounted on a vertical columnar support.

In the drawing:

Figure 1 is a perspective of the novel mounting column.

Figure 2 is a section on the line 2—2 of Figure 1 on a larger scale.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a side elevation of a typical carriage or head for use on the novel support.

Figure 5 is a section on the line 5—5 of Figure 4.

The base 1 as shown, is intended to illustrate any heavy base element to be mounted on a floor. Instead of a fixed base some X-ray apparatus moves on a track on the floor, in which case 1 would be a base equipped with carrying wheels of some kind. The column 2 is provided. It is a hollow tube which has been placed over a form and rolled with a rectangular channel 3 therein extending from top to bottom. There are various ways in which a counterweight cable pulley can be mounted on the column. The preferred manner of doing so is to provide a closure cap for the column as at 4 which fits into the top of the column, this cap having depending arms 5 that support the counterweight pulley 6 by means of an axle pin 7. The pulley is of a dimension which extends from the approximate middle of the column through the base wall of the channel which is cut away as at 8 to expose it.

Thus the counterweight cable 9 can be mounted on the X-ray mounting head so as to lie mainly within the channel as illustrated.

The counterweight 10 will be approximately of the same shape as the interior of the column and will be grooved at 11 to fit over the inward projection of the channel. This not only results in guiding the weight and preventing its rotating around but it avoids cutting down on the cross section of the weight which would otherwise be required in which case the weight would have to be longer and the counterweighted travel

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of the X-ray mounting head correspondingly restricted.

It should possibly be repeated that the same construction as above set forth is simply duplicated for as many columns as are used to support the traveling head in the X-ray apparatus.

To indicate how the traveling head will cooperate with the novel column, we have shown a head 12 which fits over the column, and at the channel side thereof is equipped with rollers 13 and 14 at the top and bottom of the head which rollers engage the base of the channel or fairly snugly engage the side walls thereof. The rollers are mounted as desired, here illustrated as on cross pins 15 and 15'. At the other side of the head a pair of pins 16 and 16' support concave faced rolls 17 and 17' which bear on the regular curved face of the column.

The usual mode of securing the cable to the head may be used which will bring the lower end of the cable slightly outside of the channel in the column. The fitting that secures the cable to the head could, however, readily be projected to place the cable directly in the channel as will be apparent without illustration. To attach the cable to the weight, it is strung through a hole 18 in the weight with its lower end tied in a knot or engaged in any desired manner.

In the particular head illustrated a pair of slide rods 19 and 19' are used on which the X-ray unit 20 is supported. These rods are guided and held in the head by rollers 21 and 21' on a cross pin 22 at the front, and rollers 23 and 23' on the upper cross pin for the rear column engaging concave rollers.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A columnar support for the sliding head on which X-ray apparatus is mounted, comprising a base at least one tubular column on the base, said column having a channel therein to act as a guide for the head, a counterweight pulley located within the top of the column and projecting within said channel through a cut away portion thereof whereby a counterweight cable attached to the head will lie within the channel, said channel of dimensions to accept the cable within its confines, a counterweight within the column, said counterweight having a groove therein to fit over the inward projection resulting from the channel.

2. The combination of claim 1, together with a head having rollers mounted thereon of a shape to fit within said channel and ride on the base thereof, and a cable connected to the head and passing over the pulley and secured to the counterweight.

3. The combination of claim 1 in which the counterweight pulley has a diameter substantially equal to the radius of the tube and positioned at the midpoint of said radius whereby a counterweight cable attached to the head will lie within said channel.

4. The combination of claim 1 in which the counterweight pulley projects only within the channel through a cut away portion thereof, and in which the pulley is of a dimension to come to approximately the center of the column whereby a counterweight cable attached to the head will lie within said channel.

5. The combination of claim 1 in which the counterweight pulley projects only within the channel through a cut away portion thereof, and in which the pulley is of a dimension to come to

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approximately the center of the column, said pulley being mounted on depending ears on a cap located in the top of the column whereby a counterweight cable attached to the head will lie within said channel.

6. The combination of claim 1 together with a head, vertically spaced rollers mounted in the head to fit within said channel, and concave rollers mounted on said head to bear on the curved face of the column opposite said first mentioned rollers whereby said head is mounted for smooth vertical movement on said column.

7. In an X-ray supporting device the combination of a hollow supporting column and a head mounted thereon, said column having a reentrant channel therein to act as a guide for the head, a counterweight pulley located within the top of the column and a counterweight within the column, said counterweight having a groove therein to fit the inward projection of the channel, a cable connected to the head and passing over the pulley and secured to the counterweight, vertically spaced rollers mounted in the head of a shape to fit within said channel, at least one concave roller mounted on the head to bear on the opposite curved face of the column whereby the head is mounted for smooth vertical movement on the supporting column, a pair of slide rods passing through the head transverse the supporting column and concave rollers mounted in horizontally spaced relation in said head on which said rods have bearing for smooth transverse movement with respect to said head.

8. The structure claimed in claim 7 in which a concave roller is positioned opposite each channel riding roller, whereby the channel rollers are maintained tightly in said channel.

9. The structure claimed in claim 7 in which a concave roller and at least one concave slide rod supporting roller are mounted upon a common cross pin in said head.

10. In a device for the purpose described, a hollow columnar tube having a longitudinal reentrant channel and a cap for the top thereof, arms extending from the cap downwardly into the tube and supporting a pulley-wheel whereby the pulley-wheel may be substantially concealed within said tube, said re-entrant channel adjacent said pulley-wheel being cut away to permit a portion of said pulley-wheel to extend into said channel.

11. In a device for the purposes described, a columnar tube having a longitudinal re-entrant channel therein, a removable cap for the top of the tube, depending arms extending from the cap within the tube and supporting a counterweight pulley having a diameter substantially equal to the radius of the tube and a portion projecting into the channel from the inside of said tube through a cut away portion thereof.

WILLIAM L. TODD.
ADOLPH H. FEIBEL.

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