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M. G. HEITZ-BOYER
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457,509
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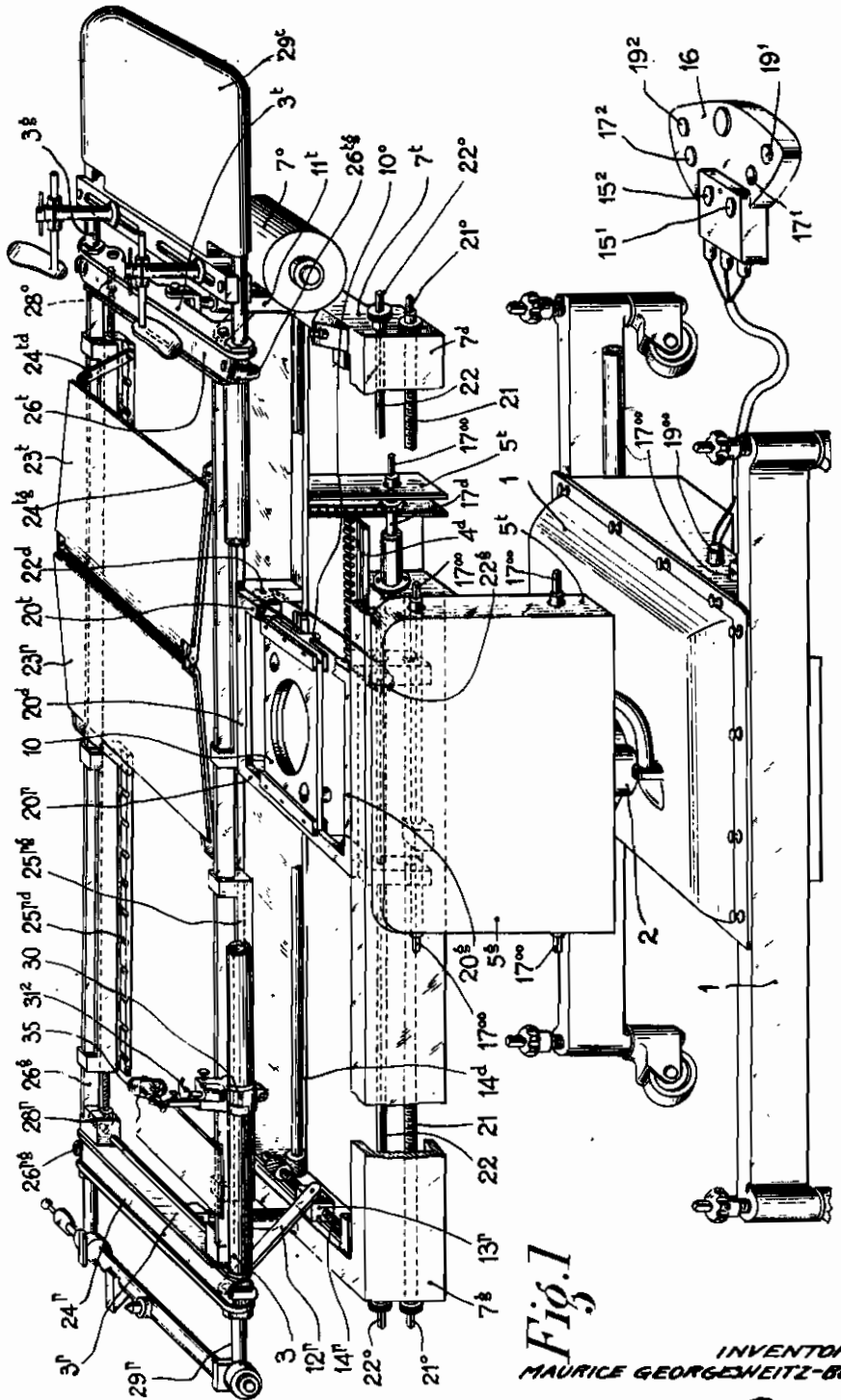

Fig. 1

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Fig. 3.

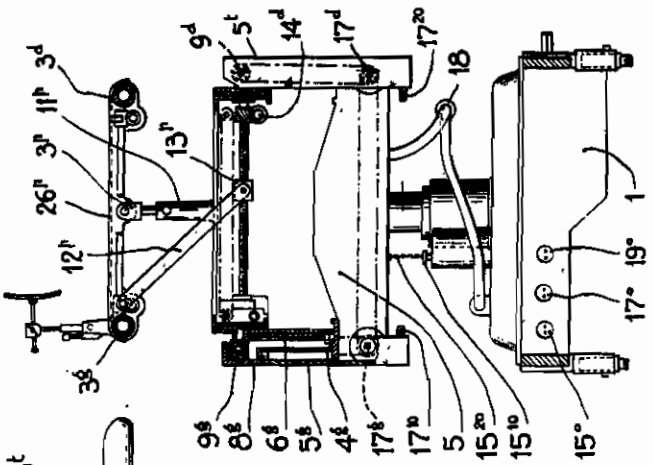

Fig. 2

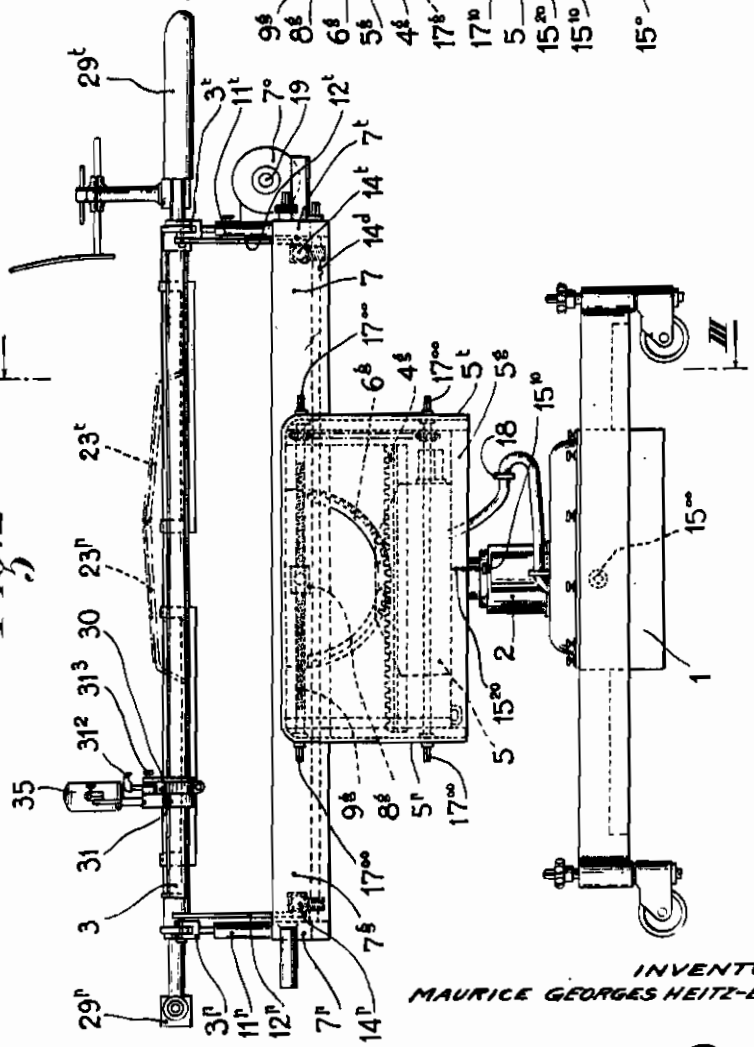

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Fig. 5.

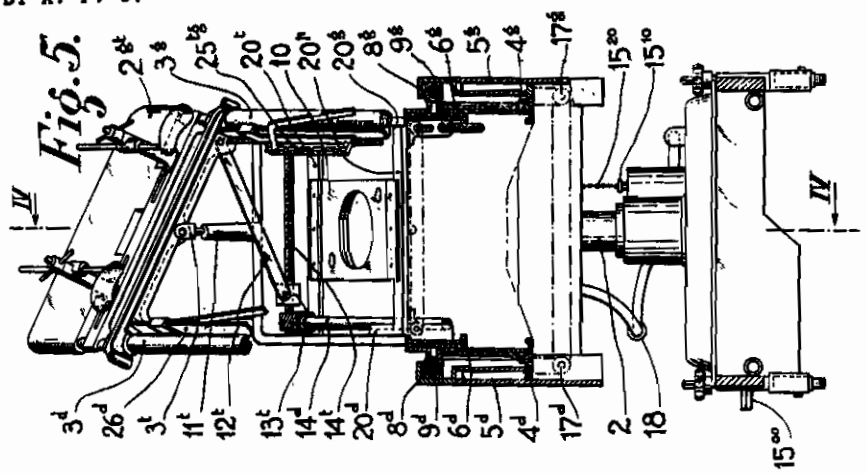

Fig. 4

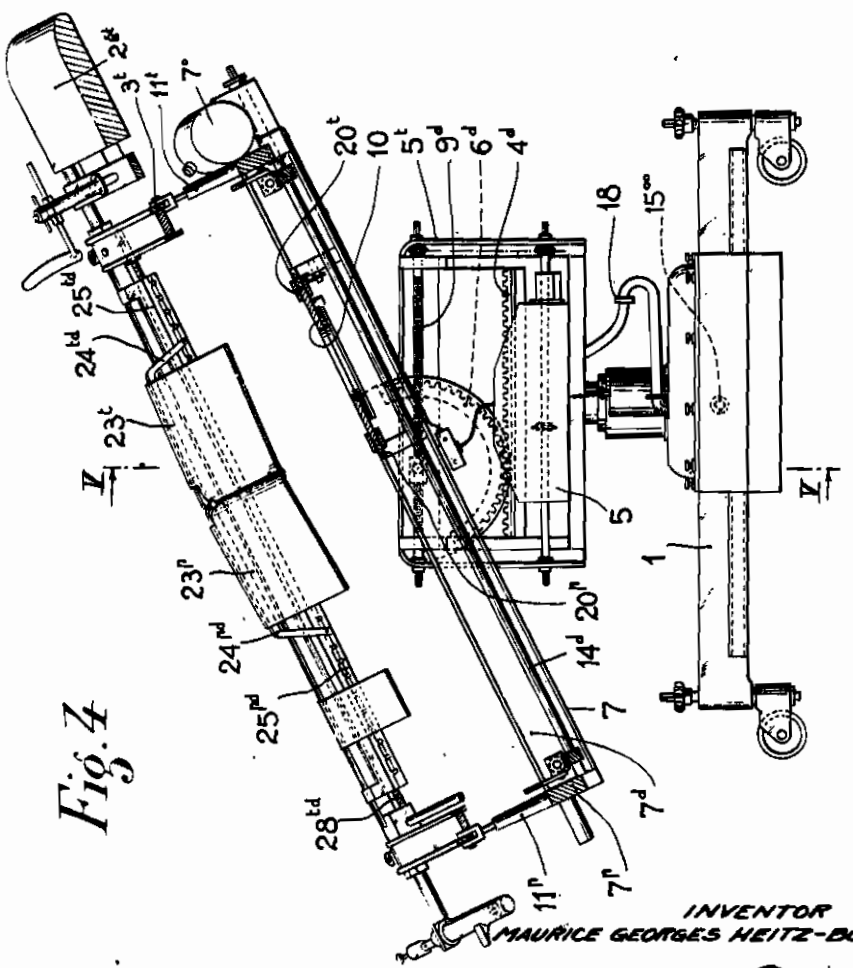

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Fig. 6.

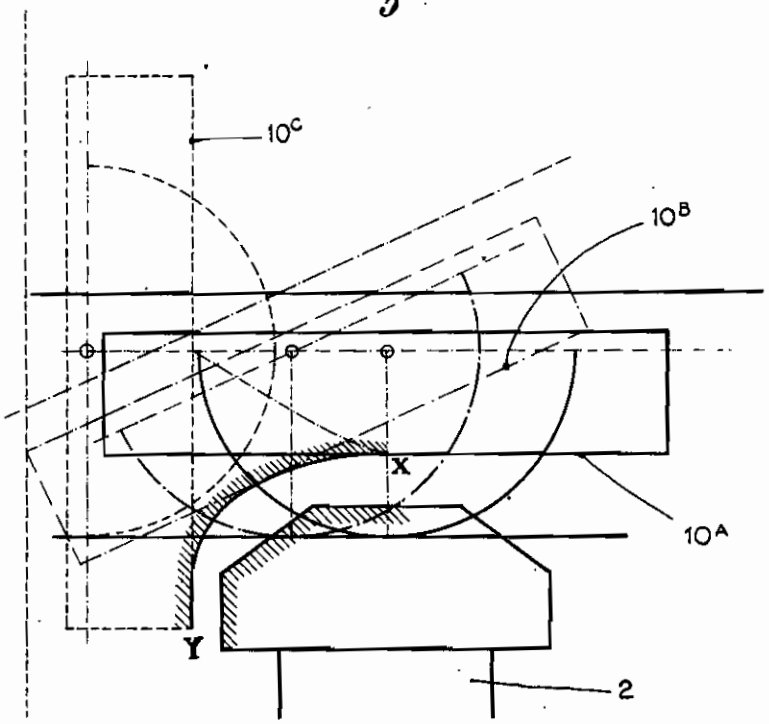

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Fig. 10.

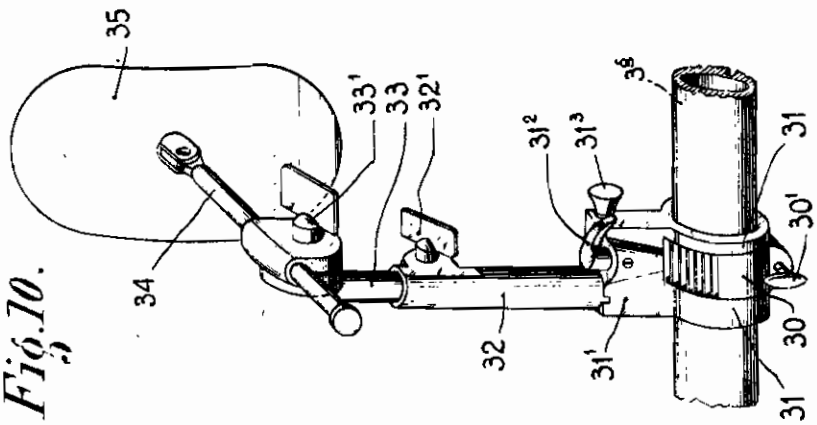


Fig. 9.

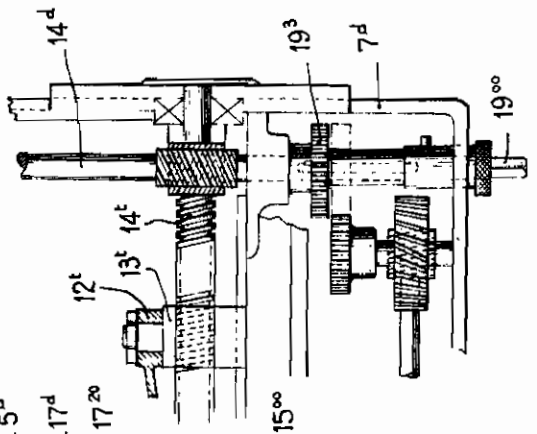


Fig. 7.

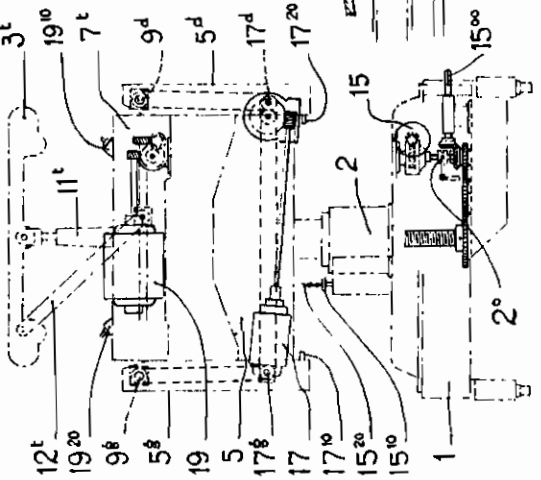
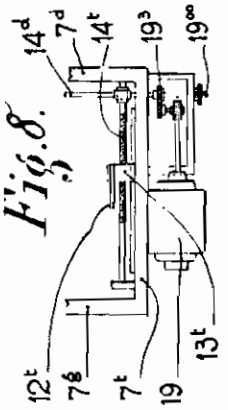


Fig. 8.



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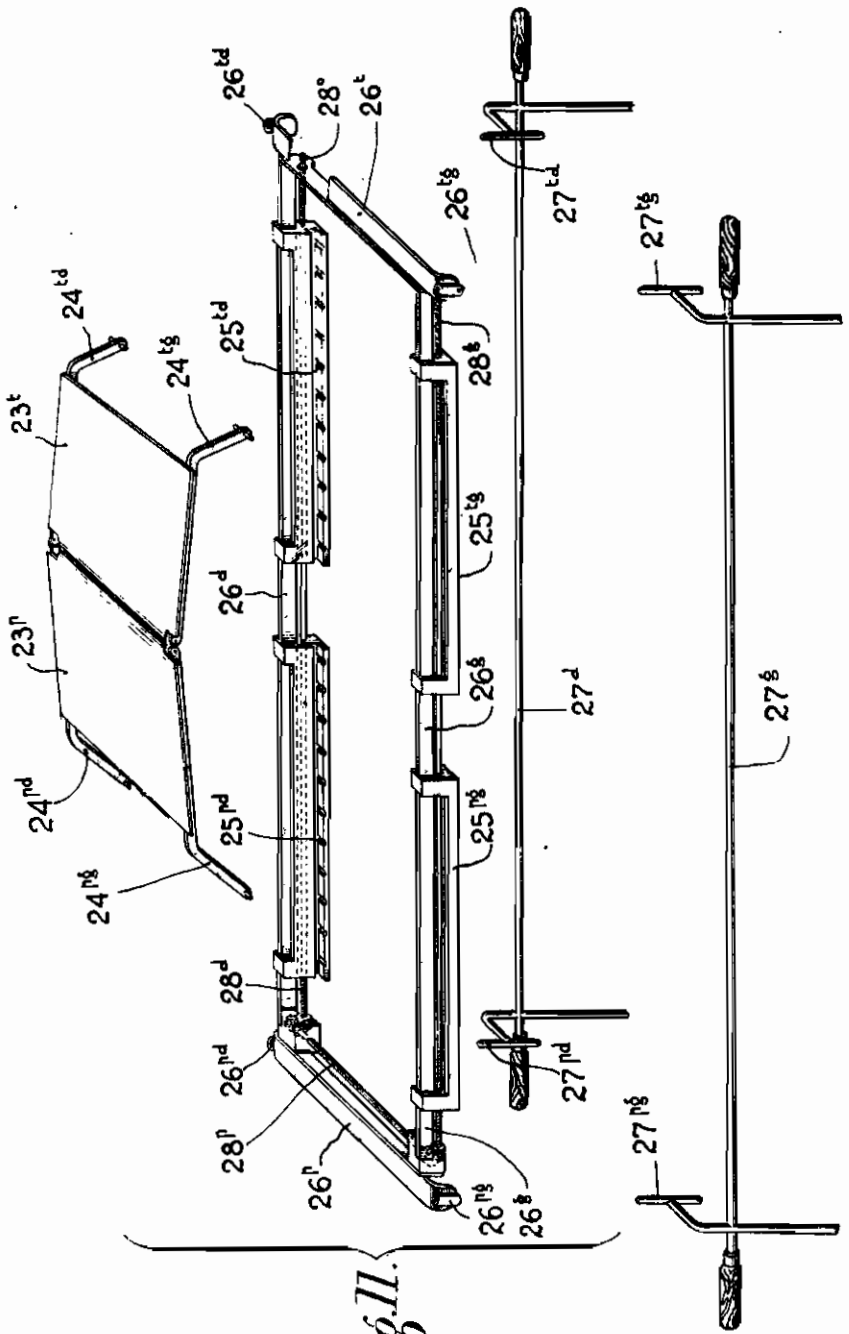

Fig. 11.

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Fig: 12

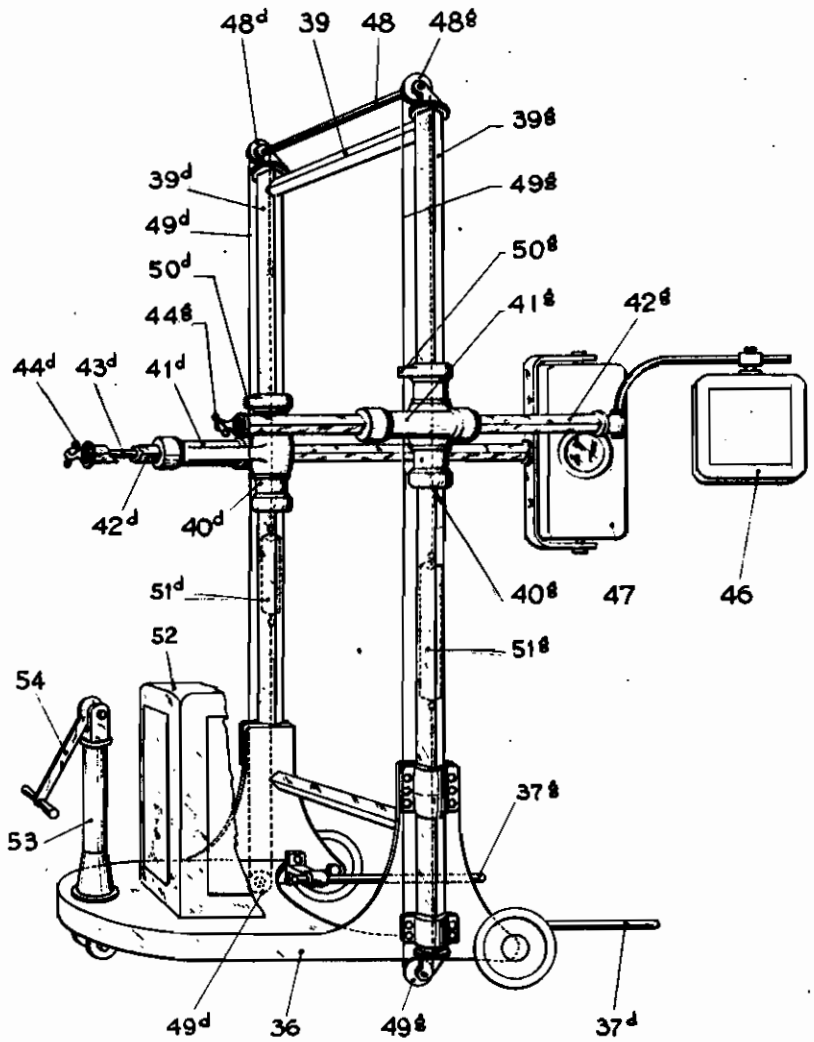

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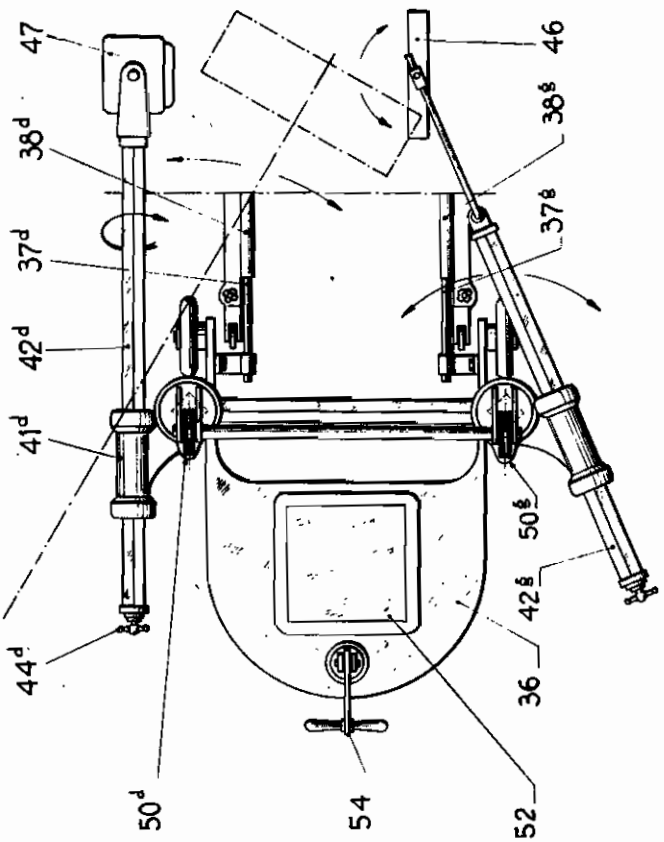
Fig: 13



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ALIEN PROPERTY CUSTODIAN

SURGICAL TABLES

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vested in the Alien Property Custodian

Application filed September 5, 1942

My invention relates to adjustable tables such as those for surgical purposes, those used as drawing boards, etc. and it refers more particularly to tables for surgeons operating with the aid of X-rays.

My invention has for its object to provide a table of the kind above-referred to which will be more easily adjustable and thus more convenient in use than the known tables.

In the annexed drawings:

Fig. 1 is a perspective view with parts in section showing a table constructed in accordance with my invention.

Figs. 2 and 3 are side and end views thereof, some parts being shown in section in Fig. 3, the plane of section being indicated at III—III in Fig. 2.

Figs. 4 and 5 are also side and end views with parts in section, showing the table at another position of the parts.

Fig. 6 is a diagram illustrating the movement of the main parts when the table is oscillated about its transverse axis.

Figs. 7, 8 and 9 refer to the electrical equipment of the table which is shown in end view, plan view and partial view to an enlarged scale, respectively.

Fig. 10 is a perspective view showing a lateral abutment.

Fig. 11 shows the stretcher, the "arching device" and the shafts which may be associated therewith.

Figs. 12 and 13 are respectively a perspective view and a plan view of an X-ray bulb support adapted to be associated with the table.

The table shown in the drawings comprises a base 1 supported by means of castor wheels, the said base being provided with a telescopic column 2 associated with a gearing to operate same in order to vary its height.

The table proper 3 is supported by column 2 through a mechanism adapted to permit its adjustment about a transverse axis, such mechanism comprising a pair of horizontal racks 4*d* and 4*g* fixed to side members 5*d* and 5*g* connected by a transverse member 5, and a pair of toothed sectors 6*d* and 6*g* cooperating with said racks. Members 5, 5*d* and 5*g* form a rigid structure fixed to column 2, while sectors 6*d* and 6*g* are rigidly carried by the longitudinal members 7*d* and 7*g* of a frame 7 which carries the table proper 3, as it will be explained below.

Carriages 8*d* and 8*g* are adapted to slide longitudinally along the upper part of side members 5*d* and 5*g* and they are actuated by a pair of longitudinal screws 9*d* and 9*g* horizontally and pivotally carried by the end portions 5*t* and 5*p* of members 5*d* and 5*g*. They are provided with trunnions on which sectors 8*d* and 6*g* are pivoted.

Fig. 6 clearly demonstrates the operation of the gearing described.

When screws 9*d* and 9*g* are actuated in unison (which is obtained by any appropriate means, such as chains and sprockets) carriages 8*d* and 6*g* are moved longitudinally and sectors 6*d* and 6*g* are oscillated together with frame 7 to which they are rigidly fixed. The assembly comprising the X-ray bulb and associated parts, carried by frame 7, thus assumes positions such as shown at 10A, 10B and 10C and is tangent to a cylindrical geometrical surface XY, the section of which is a cyloid. It will easily be grasped that this is an advantage with respect to the mere pivoting of frame 7 about a fixed transverse axis, as in the known constructions; more particularly my invention provides ample space for the X-ray bulb for any position of the table and avoids any risk of breakage of the same against the supporting column 2.

Frame 7 supports two columns 11*t* and 11*p* respectively fixed to its rear and front transverse members 7*t* and 7*p*, said columns pivotally carrying the rear and front transverse members 3*t* and 3*p* of the frame 3 forming the table proper. Two rods 12*t* and 12*p* are articulated at their upper ends to one of the ends of members 3*t* and 3*p* while their lower ends are pivotally connected with carriages 13*t* and 13*p* forming nuts on transverse screws 14*t* and 14*p* respectively. It will be understood that by operating screws 14*t* and 14*p* in unison by appropriate means, table 3 may be pivoted at will about a longitudinal axis.

As shown in Figs. 7 to 9, column 2 may be operated by an electric motor 15 housed within base 1, this motor being electrically connected through a plug 15^0 (Fig. 3) with a pair of pedals 15^1 and 15^2 (Fig. 1) disposed on a separate base or switchboard 16 and corresponding to upward and downward movement of column 2. There is also provided a switch with an operating head 15^{10} connected by a chain 15^{20} with member 5 and adapted to be actuated when the table reaches respectively its lowermost and its uppermost positions to cause stoppage of motor 15 while permitting its rotation in the reverse direction.

The mechanical connection between motor 15 and column 2 comprises a clutch 2^0 and a shaft with a square end 15^{00} projecting from the gear case and adapted to receive an actuating handle, in order to permit hand actuation when the motor is de-clutched.

A second electric motor 17 is provided to actuate screws 6*d* and 9*g*; it is energized through a plug 17^0 to which it is connected by means of wires passed through an articulated tubing 18. Plug 17^0 is itself connected with pedals 17^1 and 17^2 on base 16. And there is also provided a pair of end switches 17^{10} and 17^{20} to cause motor stoppage at the ends of the stroke.

In Fig. 7 it will be seen that motor 17 drives a

shaft 17*d* extending horizontally along one side of the structure, said shaft being chain connected with another shaft 17*g* extending along the other side, and shafts 17*d* and 17*g* driving screws 9*d* and 9*g* by means of chains and sprockets. Hand actuation is enabled by a square end 17^{00} in cooperation with a clutch not illustrated.

A third electric motor 19 is disposed within a casing 7^{0} on member 7*t* of frame 7; it is controlled through a plug 19^{0} by pedals 19^{1} and 19^{2} on base 18, associated with end switches 19^{10} and 19^{20}. The gearing between motor 18 and screws 14*t* and 14*p* comprises a pair of gears connecting said screws with an actuating shaft 14*d* carried along member 7*d*. Shaft 14*d* is connected with motor 19 by means of a slidable pinion 19^{3} forming a clutch and there is provided a square 19^{00} to permit hand actuation.

The support 10 of the X-ray bulb is slidably fixed on the transverse sides 20*p* and 20*t* of a frame, the longitudinal sides 20*d* and 20*g* of which are slidable along members 7*d* and 7*g*. The side member 20*g* is provided with two superimposed longitudinal bores; the first one, which is threaded, is adapted to receive a screw 21 pivotally supported by frame 7; and the second one which is cylindrical, slidably receives a square shaft 22 also pivotally carried by frame 7. There is provided a chain sprocket 22*g* on shaft 22 and another chain sprocket 22*d* loose on a journal carried by the other longitudinal side 20*d*, and sprockets 22*g* and 22*d* are connected with each other by means of a chain fixed to a pin 10^{0} carried by the corresponding transverse side of support 10.

It will be understood that the X-ray bulb may thus be moved longitudinally by actuating screw 21, and transversely by actuating shaft 22. This actuation may be performed by hand, through square ends 21^{0} and 22^{0}, or electrically, by means of an electric motor associated with control means of the kind described with reference to Figs. 7 to 9.

The arching device comprises a pair of rectangular plates 23*t* and 23*p* articulated to each other along one of their transverse sides while their opposed transverse sides are provided with wings 24*td* and 24*tg* or 24*pd* and 24*pg* with transverse pins. This device also embodies two pairs of slides 25*td* and 25*pd* or 25*tg* and 25*pg*, which are mounted respectively on the right and left transverse members of frame 3 or, preferably as shown, on the transverse members 26*d* and 26*g* of an additional frame freely carried by the former and adapted to be used as a stretcher for carrying the patient, by means of sockets 26*td* and 26*pd* or 26*tg* and 26*pg* provided in the angles of the said additional frame to receive gudgeons 27 *td* and 27*pd* or 27*tg* and 27*pg* projecting upwardly from the carrier shafts 27*d* and 27*g* (Fig. 11). Slides 25*td*, 25*tg*, 25*pd* and 25*pg* are provided with inwardly projecting edges having on their upper face a series of notches adapted to receive the transverse pins of wings 24*td*, 24*tg*, 24*pd* and 24*pg* respectively.

Means are also provided to move the slides of each pair towards those of the other pair, such means comprising preferably a pair of screws 28*d* and 28*g* pivotally carried by the additional frame 26 in parallel relation with respect to the longitudinal members thereof, such screws being provided with opposed pitches in such a manner that by rotating same the two pairs of slides may be moved in opposed direction. Screws 28*d* and 28*g* are driven either by hand, through a square end 28^{0}, or electrically by means such as described with reference to Figs. 7 to 9.

The table described also comprises a head support 29*t* and a foot support 29*p*, each being carried by broaches driven through the tubular ends of the longitudinal members of frame 3 and fixed at the appropriate position by means such as radial pins.

Fig. 10 shows an adjustable abutment comprising a splitted collar 30 slidably keyed on transverse member 3*g* (or 3*d*) and clamped in position by means of a screw 30^{1}, a double plain collar 31 formed of two elements between which collar 30 is comprised, and a body 31^{1} integral with collar 31, the said body receiving the lower end of a tubular rod 32 forming a telescopic arrangement with another 33. The upper end of rod 32 is splitted and it is provided with a clamping screw 32^{1}. Rod 33 carries a splitted collar in which there may be clamped a rod 34 to which there is articulated the curved piate 35 forming the abutment proper. A screw 33^{1} permits of clamping rod 34 at the desired position.

Collar 31 is angularlly fixed on member 3*g* by means of ratchet teeth cut in collar 30 and engaged by a pawl, not illustrated, pressed by a spring and freed by a hand lever 31^{2}. It will readily be grasped that by lifting lever 31^{2} the pawl is disengaged from the ratchet and collar 30 is free to rotate.

There is associated with the table described an X-ray support comprising a carriage 36 supported by castor wheels and provided with broaches 37*d* and 37*g* by means of which it may be fixed to the base 1 of the table through sockets 38*d* and 38*g* provided on the same. This carriage supports two uprights 39*d* and 39*g* connected by a cross-bar 39. Uprights 39*d* and 39*g* slidably support sleeves 40*d* and 40*g*, each carrying another sleeve 41*d* and 41*g* respectively, with their axes horizontal. Arms 43*d* and 42*g* are driven through sleeves 41*d* and 41*g*; they are preferably square in cross-section, as well as the corresponding sleeves themselves, and they are provided with a circular axial hole. Each arm supports a rod 43*d* and 43*g* engaged into the axial bore thereof and having at its rear end a clamping device comprising a handle 44*d* or 44*g* adapted to be screwed on the said end. Arms 42*g* and 42*d* support a frame 48 adapted to receive a screen or a photographic plate and an X-ray bulb 47.

Pulleys 49*d* and 49*g* are arranged at the upper end of uprights 51*d* and 51*g* on the same transverse shaft 46. The lower end of said uprights also comprises pulleys 49*g* and 49*d* on the same transverse shaft 49 and the said pulleys receive two endless wires or strings 42*g'* and 49*d'* attached to noses 50*d* and 50*g* carried by sleeves 40*d* and 40*g*. Counterweights 51*d* and 51*g* are provided to balance the weight of the parts associated with the sleeves.

The carriage also supports the electrical apparatus 52 supplying current to the X-ray bulb, and it is provided with a column 53 with an articulated handle 54 by means of which the carriage may be moved.

It will easily be grasped that the carriage thus established permits of placing the X-ray bulb and the corresponding frame at any position. Fig. 13 shows by way of example in dash and dot lines the position corresponding to an X-ray exposure with the bulb under the body.

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