April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 1

Fig. 1

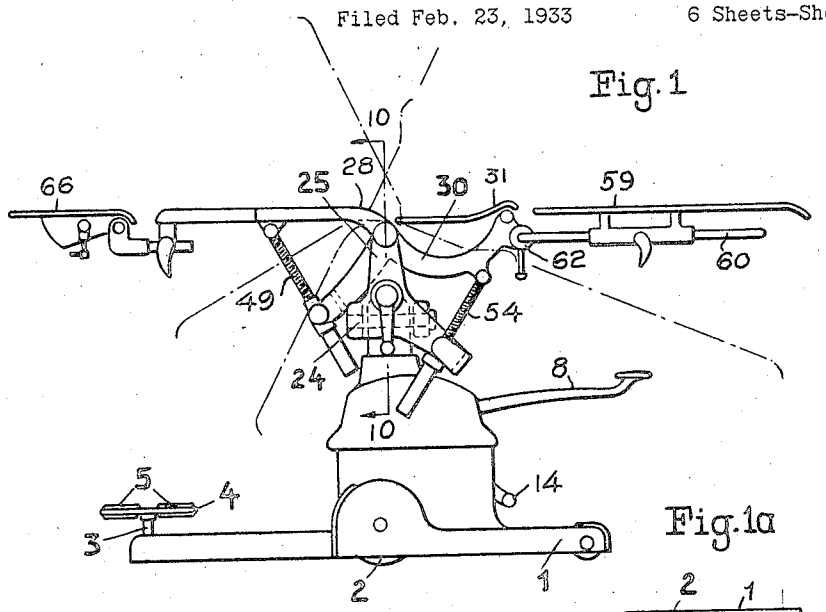


Fig. 1a

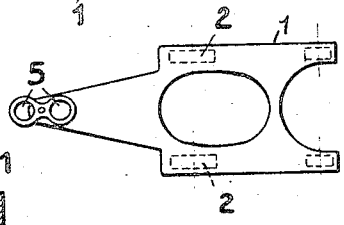


Fig. 2

INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 2

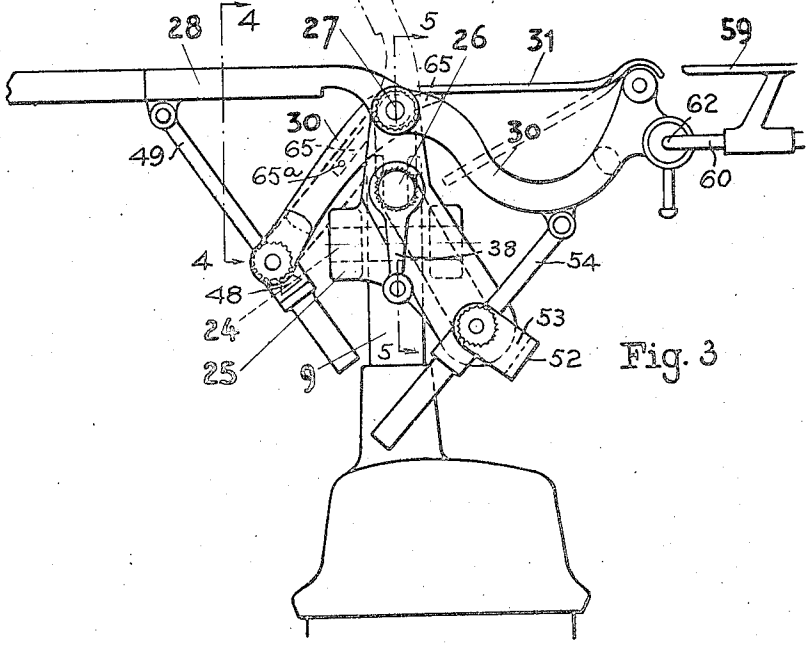


Fig. 3

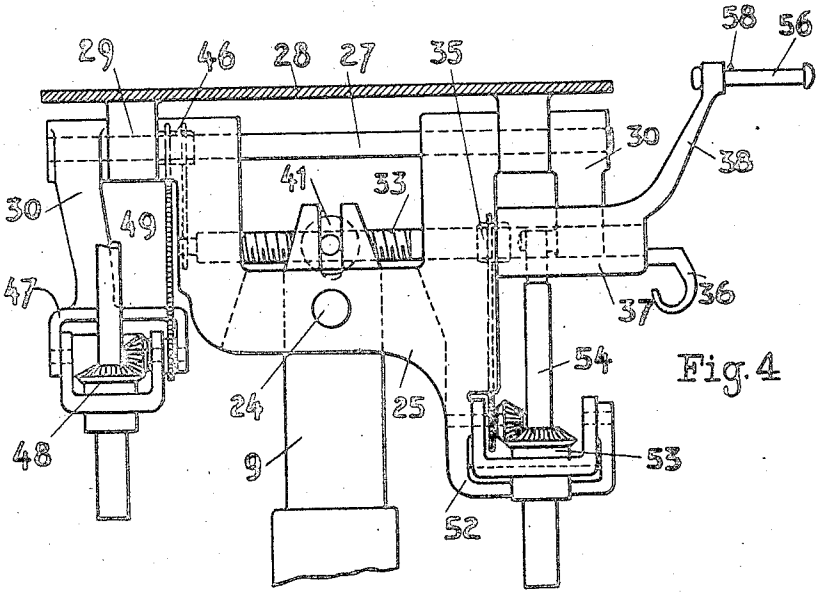


Fig. 4

INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 3

Fig. 5

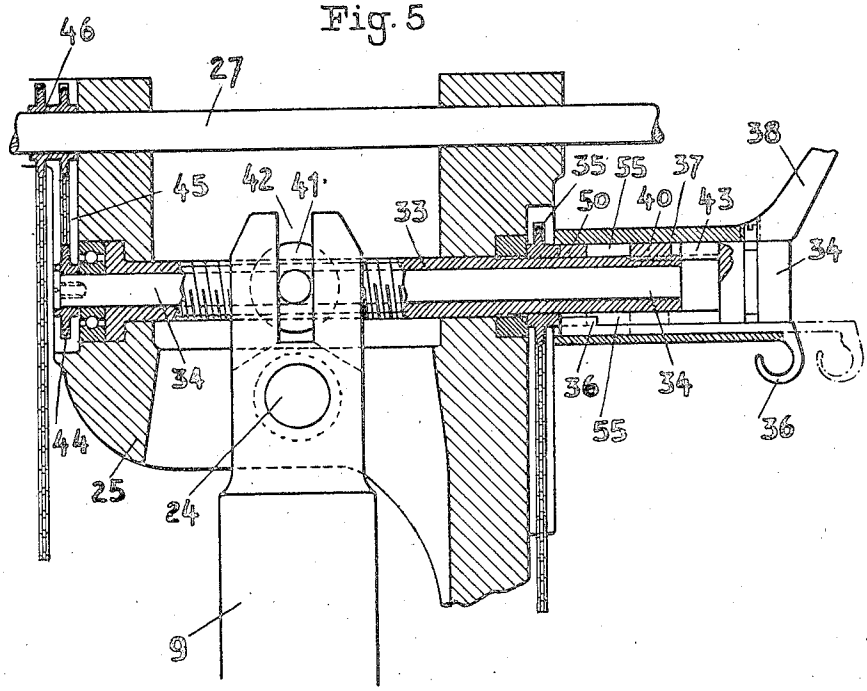
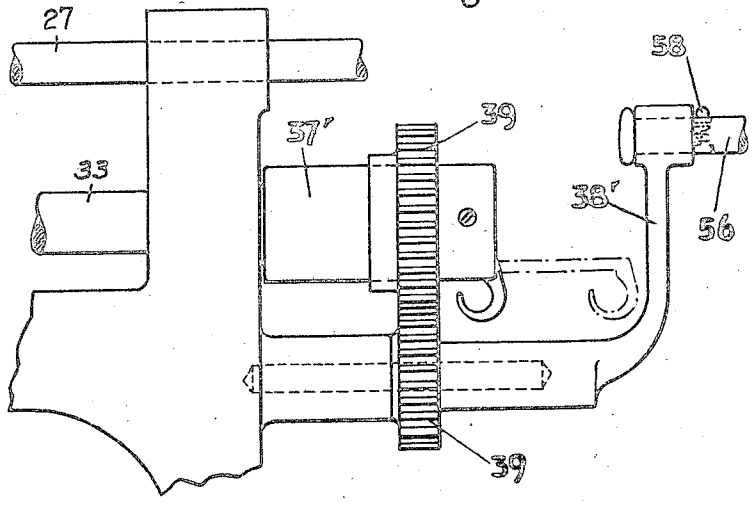


Fig. 6



INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 4

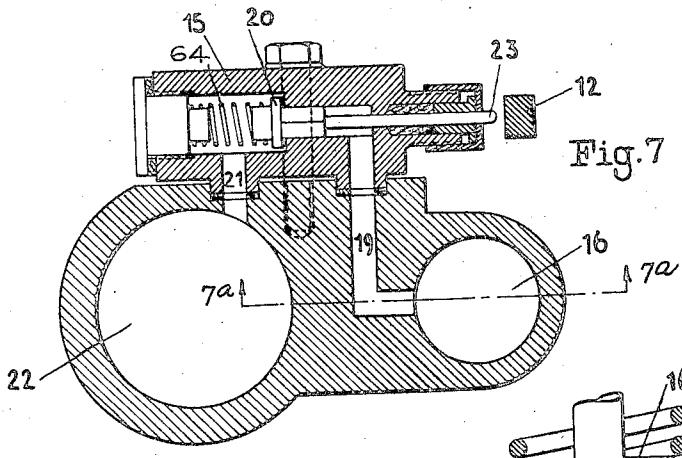


Fig. 7

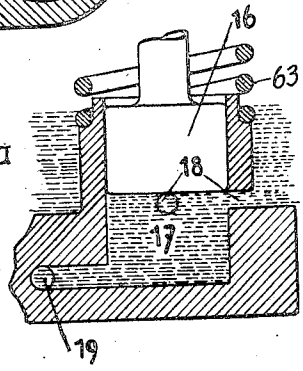


Fig. 7a

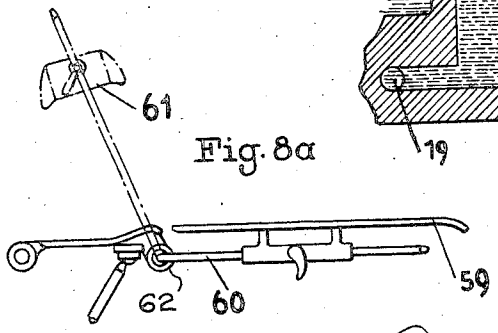


Fig. 8a

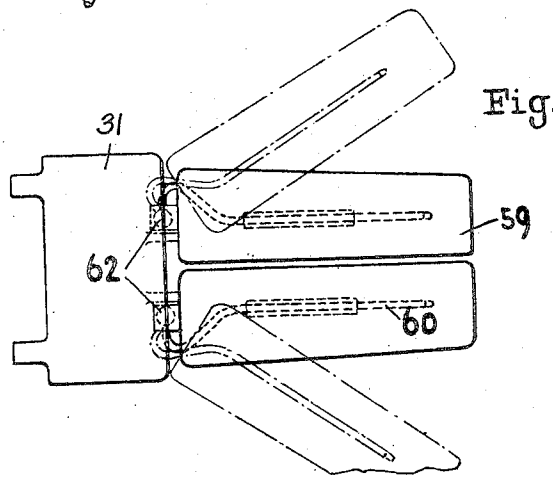


Fig. 8

INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 5

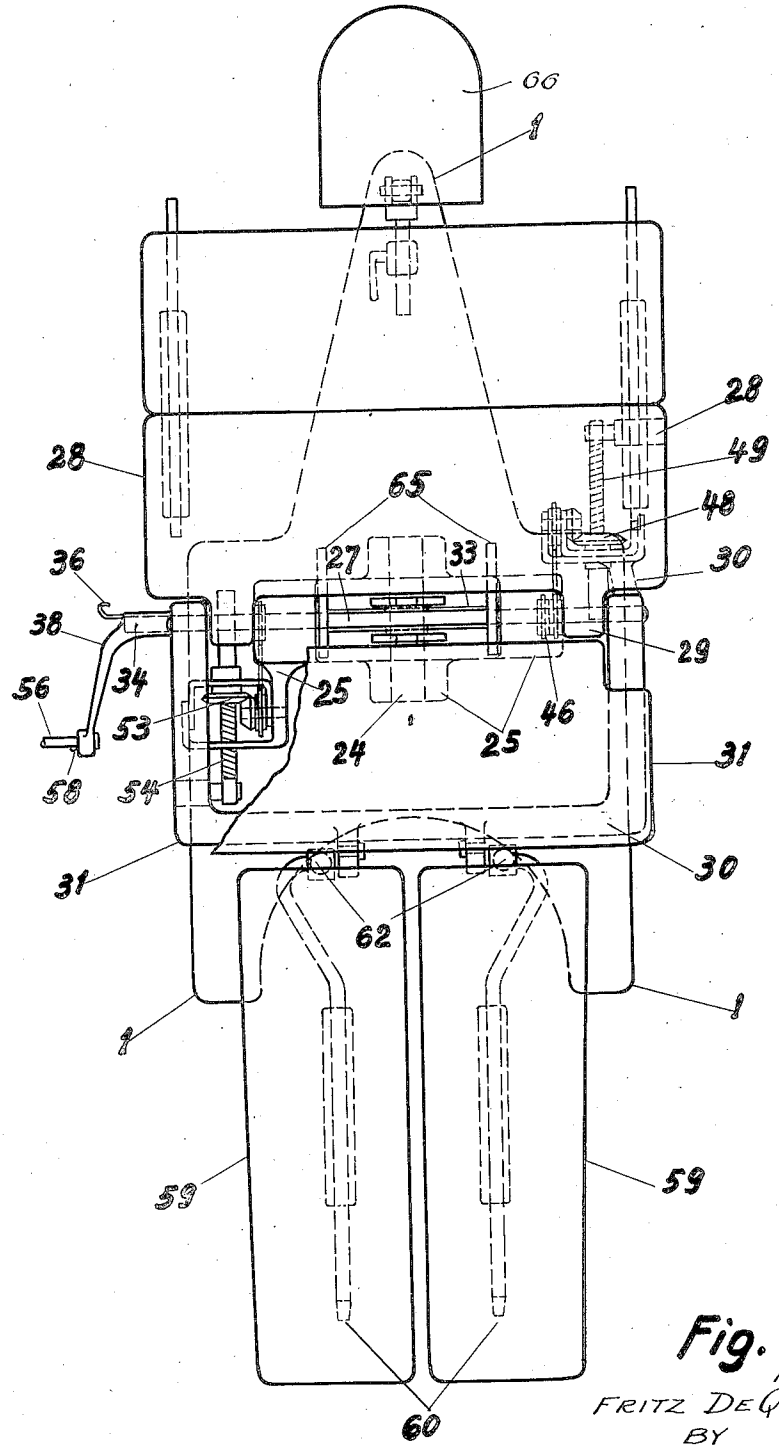


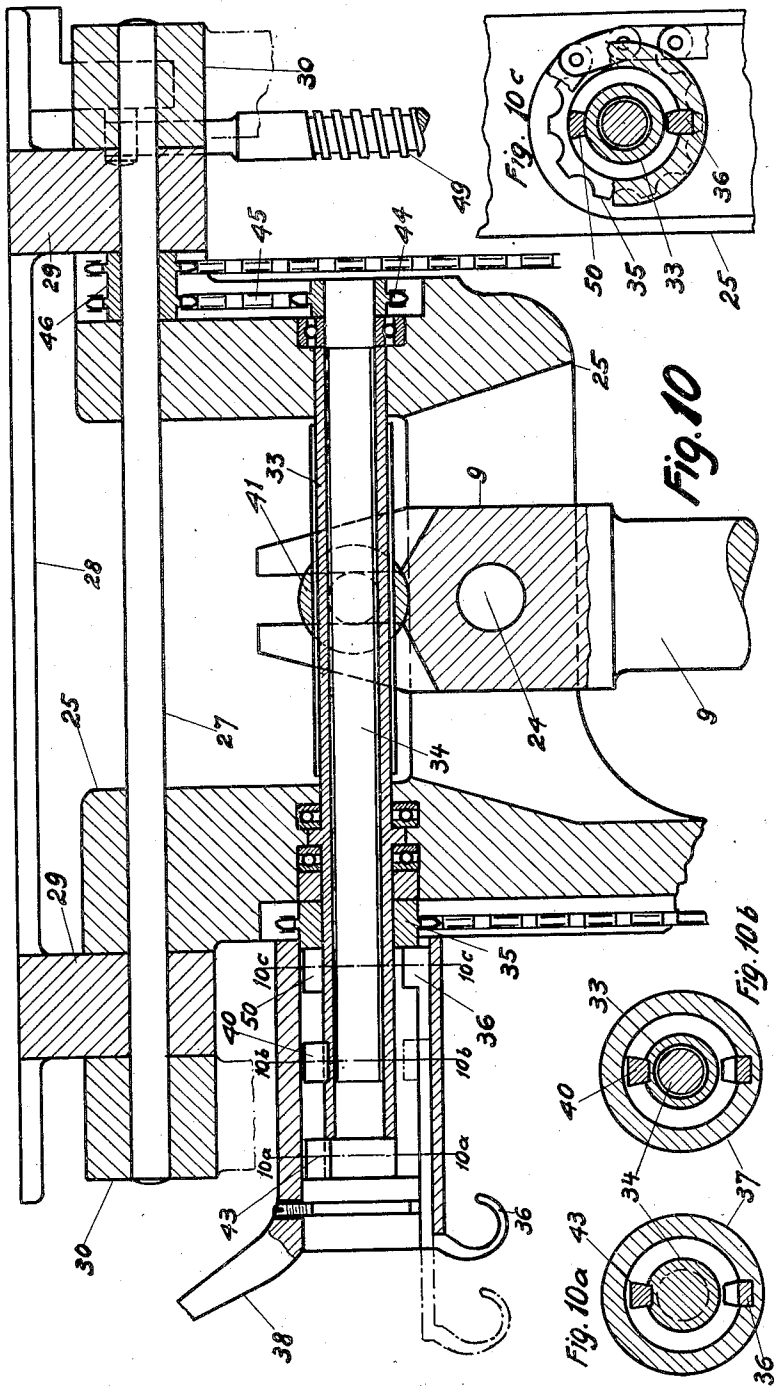
Fig. 9

INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

April 21, 1936. F. DE QUERVAIN 2,037,888

OPERATING TABLE

Filed Feb. 23, 1933 6 Sheets-Sheet 6



INVENTOR
FRITZ DE QUERVAIN
BY
Oscar A. Geier
ATTORNEY

Patented Apr. 21, 1936 2,037,888

UNITED STATES PATENT OFFICE

2,037,888

OPERATING TABLE

Fritz de Quervain, Bern, Switzerland

Application February 23, 1933, Serial No. 658,159½
In Switzerland February 23, 1932

3 Claims. (Cl. 311—7)

Operating tables with the platform built of separately adjustable parts (head rest, back, seat and leg rest, back and seat being the principal parts) are already known. They have different mechanisms for moving these parts mounted upon the table frame, each of which can be worked wholly independently of the rest.

In known constructions of this kind there is some danger that in certain circumstances the wrong lever may be released—for instance by an unpracticed person—and undesired effects brought about. Moreover unnecessary time and trouble are taken in finding the several handles in their various positions. And the many actuating devices (levers, stays, handles and the like) hinder free movement of the operating surgeon around the table and make it difficult to keep the table thoroughly clean.

The purpose of the present invention is to make an operating table safe and convenient to handle by as far as possible centralizing the means required for moving the platform. This central actuating mechanism should provide for: 1. Inclining the platform head downward, 2. Or foot downward, 3. Raising only the back and the head-rest attached to it to sitting position, 4. Lowering the back and head rest alone so that the head is downward, 5. Setting the back and head rest at an upward slant, and inclining the aligned seat and leg rest downward towards the feet, and 6. Tilting the whole platform sideways about its longitudinal axis.

For this purpose according to the invention an operating table having a divided platform of which the principal parts—back and seat—are moved by screws, is so constructed that the lifting, lowering, inclining lengthwise, and tilting sideways of the principal parts is effected by one mechanism, while the subordinate parts—head and leg-rest—which move with the principal parts can also be separately adjusted.

The accompanying drawings show diagrammatically an example of how the invention may be constructed.

Fig. 1 is an elevation of the table, indicating in broken lines various positions of the several parts.

Fig. 1*a* is a plan of the base plate on a smaller scale.

Fig. 2 is a section through the lower part of the table showing the automatic clamp of the lifting plunger.

Fig. 3 is a front view of the central actuating mechanism, and indicates in broken lines a steeply inclined position of the back.

Fig. 4 is a side view of the central actuating mechanism with the platform carrier and the adjusting screws.

Fig. 5 is a section through the axis of the central actuating mechanism.

Fig. 6 shows an alternative mounting of the actuating crank handle.

Fig. 7 is a horizontal section, and

Fig. 7*a* a part vertical section through the single valved pump.

Figs. 8 and 8*a* are elevation and plan views respectively of the leg rest mounting.

Fig. 9 is a plan view of the operating table.

Fig. 10 is a section through the central actuating mechanism along the line **10**—**10** of Fig. 1.

Fig. 10*a* is a section along the line **10***a*—**10***a* of Fig. 10.

Fig. 10*b* is a section along the line **10***b*—**10***b* of Fig. 10.

Fig. 10*c* is a section along the line **10***c*—**10***c* of Fig. 10.

The substructure of the operating table shown comprises a base plate **1** (Fig. 1) which may be replaced by a tripod or like support. This base plate is mounted on rollers **2** the axis of which crosses the longitudinal axis of the table beneath the centre of gravity, so that when the support screw **3** is slackened the whole table is approximately in neutral equilibrium upon these rollers, and so can be shifted from place to place or turned about a vertical axis with very little trouble.

The support screw **3** has a head **5** like a pair of spectacles, so that it may be quickly adjusted by putting the heel in one or other of the two rings **5** and rotating the ring about the axis of the screw. By turning the screw down the weight of the table can be taken off the rollers **2** and thrown upon the screw and two rollers not in line with it, forming with it a three point support.

In a hollow substructure upon the base plate **1** (Fig. 2) there is mounted a hydraulic pump which delivers liquid for lifting the plunger on which the superstructure of the table rests. This pump has automatic means for locking the plunger **9** to prevent it sinking. The pump operating lever **6** has a lug **7** projecting to one side which, when the pump pedal **8** and lever **6** are in their uppermost position, presses on the long tail of a pivoted key **10** and forces the key into a slot **11** in the lifting plunger **9** so locking it against both axial movement and rotation. The plunger **9** is prevented from moving in the direction of its axis by the pressure exerted by the key **10** against the bottom of the slot **11**. The release lever **12** which

is rigidly connected with the lowering pedal **14** is also connected by a link **13** with the arm **6** in such fashion that when the pedal **14** is moved downward, the lever **12** pulls down the arm **6** and so withdraws the key **10** and releases the plunger **9** before the lever **12** strikes the stem **23** of the release valve.

The valve casing is a readily replaceable unit **15** (Fig. 7). The pump piston **16** in the cylinder **17** is moved upwards by the spring **63** (Figs. 2 and 7*a*) and produces suction, which as soon as the ports **18** are uncovered draws in oil and quickly fills the cylinder. On the piston **16** descending the oil is forced through the passage **19**, lifts the nonreturn valve **20** which is operated by the spring **64** (Fig. 7) and enters the plunger cylinder **22** through the passage **21**.

The upper end of the plunger **9** (Figs. 3 and 4) is pivotally connected by a pin **24** with a carrier **25** which can tilt sideways relatively to the longitudinal axis of the table and which carries the platform. The central actuating mechanism **26**, which brings about all movements of the principal parts of the platform is also mounted on this carrier. The back **28** is supported by two ears **29** upon a transverse shaft **27** mounted in the carrier. The frame **30** supporting the seat **31** and leg rests **59** also turns upon the transverse shaft **27**. The central actuating mechanism (Fig. 3) is a combination of several actuating members (seen in Fig. 5), viz. a main hollow shaft **33**, a shaft **34** carried within the hollow shaft, and a chain sprocket **35** mounted upon the hollow shaft. Any one of these three members may be coupled by a sliding key **36** with a sleeve **37** surrounding the three members at the front of the table. A crank handle **38**, connected with the sleeve **37** either directly or through a chain, or gearing **39** (Fig. 6) or other means, turns whichever one of the actuating members is coupled to the sleeve.

Two double armed levers **65**, one of which is shown by broken lines in Fig. 3, are rotatably mounted upon the shaft **27**. The short arms of the levers **65** support the seat **31** in its horizontal position shown by full lines in Fig. 3. The levers **65** are held in this position by a suitable pin **65***a* passing through openings formed in the frame **30** and in the levers **65**.

If the levers **65** are rotated counter-clockwise (looking in the direction of Fig. 3), they will move out of contact with the seat **31** which will drop to the position shown by broken lines in Fig. 3; the seat **31** is held in this inclined position by any suitable projections provided upon the member **30**.

At the crank handle end the hollow shaft **33** (Fig. 5) carries a feather **40**. If the key **36** is shifted to engage the feather **40** and the sleeve **37** is turned by the crank handle, the hollow shaft **33** screws into a nut **41** held in the forked end of the plunger **9**, and so tilts the carrier **25** and the platform sideways around the pin **24**, the other actuating members, shaft **34** and sprocket **35**, meanwhile remaining still. If the shaft **34** is coupled with the sleeve **37** by engagement of the key **36** with the feather **43**, and turned, the sprocket **44**, acting through chain **45** (or toothed wheels) and intermediate sprockets **46**, turns the nut **48** (Fig. 4) which is swivelled in the forked end **47** of the frame **30**, and so thrusts up or down the threaded rod **49** which is screwed into the nut. By this means the back **28** to which the rod **49** is pivoted is raised or lowered, together with the head rest **66** (Fig. 1) that is hinged upon it, and is separately adjustable. If, as shown in Figs. 4 and 5, the sliding key **36** is in engagement with the walls of a recess formed in the sprocket **35**, turning of the sleeve **37** by the crank handle **38** rotates the nut **53** which is swivelled in the stirrup **52** of carrier **25**, and so moves the rod **54** up or down. This rod is hinged to the frame **30** which carries the seat and leg rests, and so the frame is correspondingly tilted. As the nut **48** controlling the back is also mounted in the frame **30**, it will follow the movements of the frame, but will not itself turn, its actuating member, shaft **34**, being stationary. Hence the whole platform is tilted.

Details of the crank handle mechanism may be seen in Figs. 4 and 5. The crank handle **38** is free when the sliding key **36** is brought to the gap **55** between the feathers of the actuating members. The handle proper, **56**, can slide through the crank, and is normally kept in position for use by the spring-pressed stud **58**.

Fig. 6 shows an alternative mounting of the actuating crank handle. The device illustrated in this figure comprises the handle proper **56** connected with a bent member **38'** which actuates the sleeve **37'** by means of the two gear wheels **39—39**.

The leg rests **59** (Fig. 8) are mounted on arms **60**, they can be removed and replaced by leg clasps **61**. The arms **60** are supported by ball and socket joints **62** approximately beneath the hip joints of the patient, so that the leg rests may be spread wide apart horizontally.

What is claimed as new is:

1. An operating table, comprising an elongated platform having a back section and a seat section, a support for said platform, a single handle situated at one of the longitudinal sides of the operating table and below said platform, and means connected with said handle and said platform and adapted to be selectively actuated by said handle either for inclining lengthwise the back section of said platform, or for tilting laterally the entire platform.

2. An operating table, comprising a platform having a back section mounted for relative movement with respect to a seat section, a support, said platform being pivotally mounted on said support for movement about at least two given horizontal axes, means operatively connecting said platform sections and support, and a single handle connected to said means to selectively actuate said means to incline said platform sections as a unit about one of said horizontal axes or to incline said back section with respect to said seat section.

3. An operating table comprising a platform having a back section mounted for relative movement with respect to a seat section, adjustable head and leg rests connected with said platform, a support, said platform being pivotally mounted on said support for movement about at least two given horizontal axes, means operatively connecting said platform sections and support, and a single handle connected to said means to selectively actuate said means to incline said platform sections as a unit about one of said horizontal axes or to incline said back section with respect to said seat section.

FRITZ DE QUERVAIN.