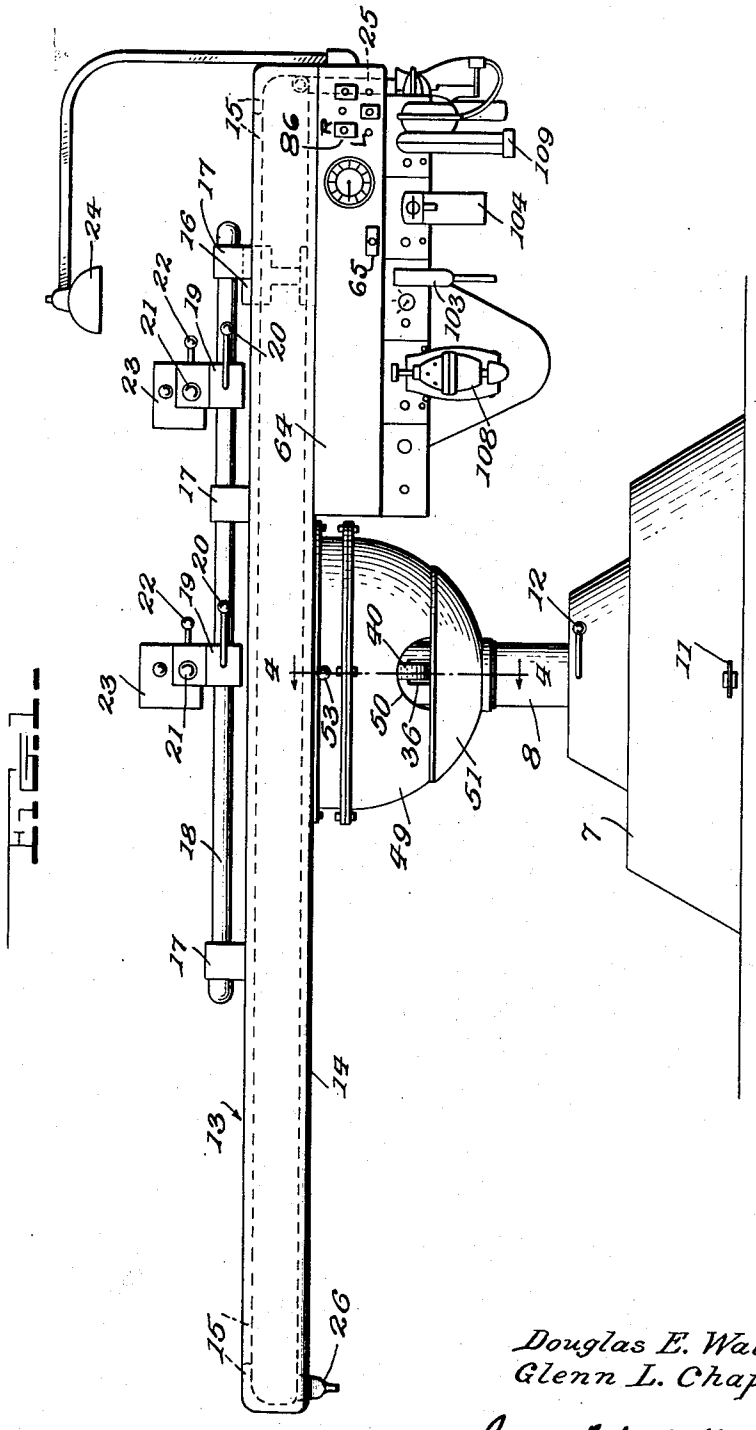
Nov. 9, 1954 D. E. WALL ET AL 2,693,987

MECHANICALLY CONTROLLED EMBALMING TABLE

Filed Oct. 28, 1952 4 Sheets-Sheet 1



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MECHANICALLY CONTROLLED EMBALMING TABLE

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4 Sheets-Sheet 2

FIG. 1

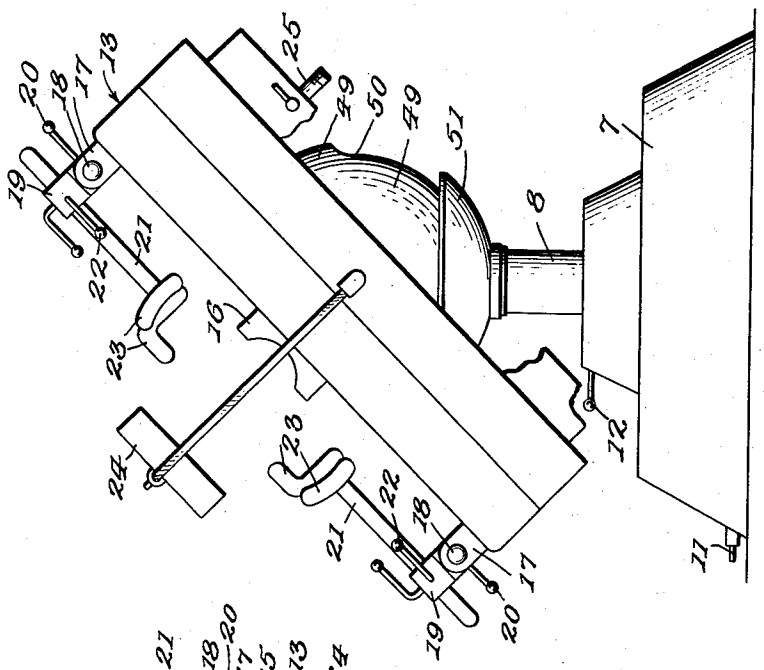
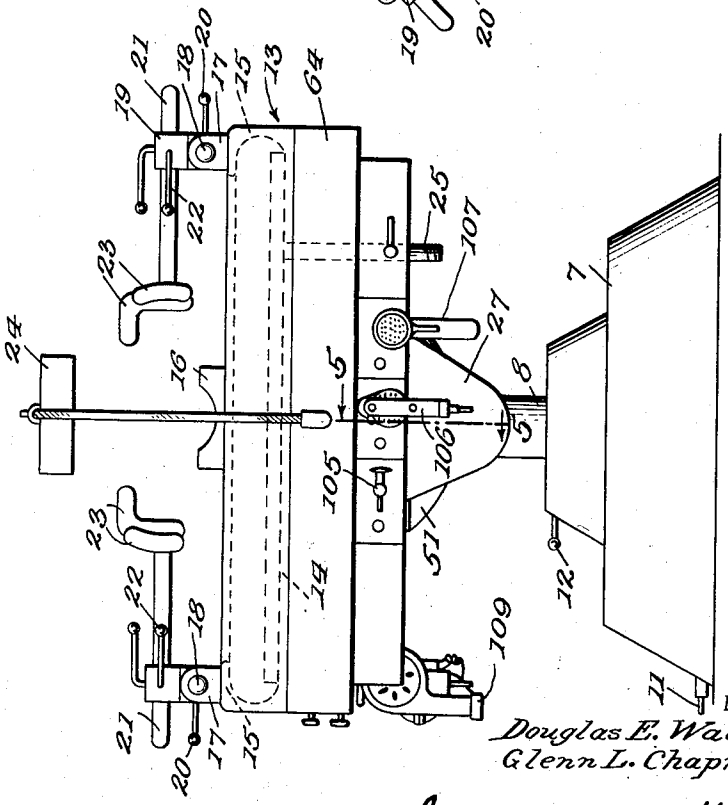


FIG. 2



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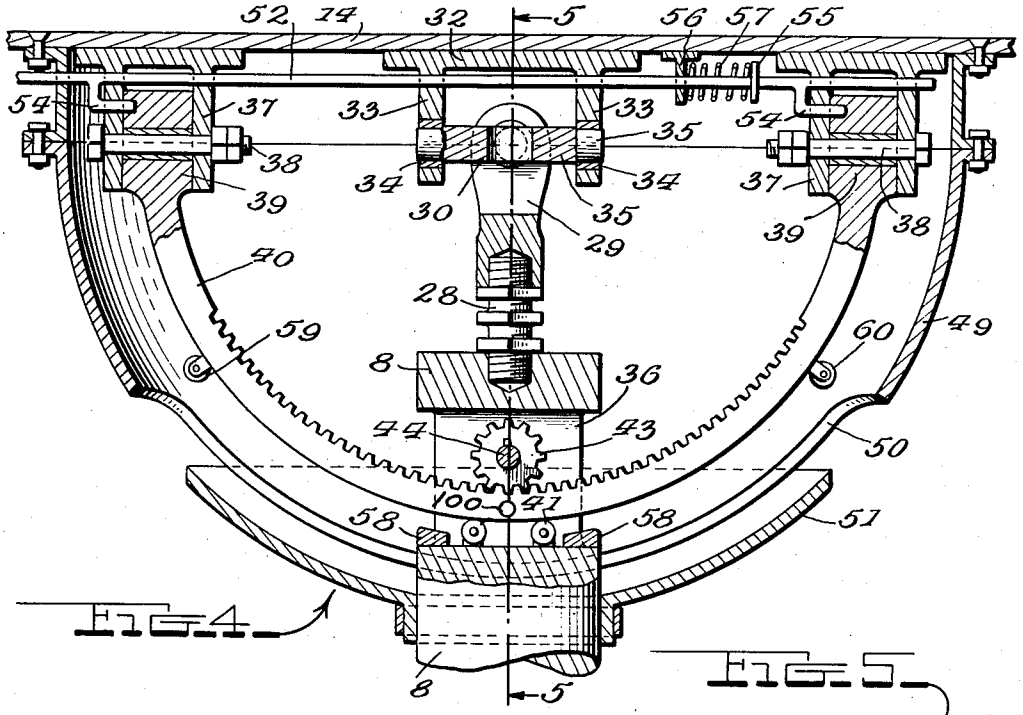
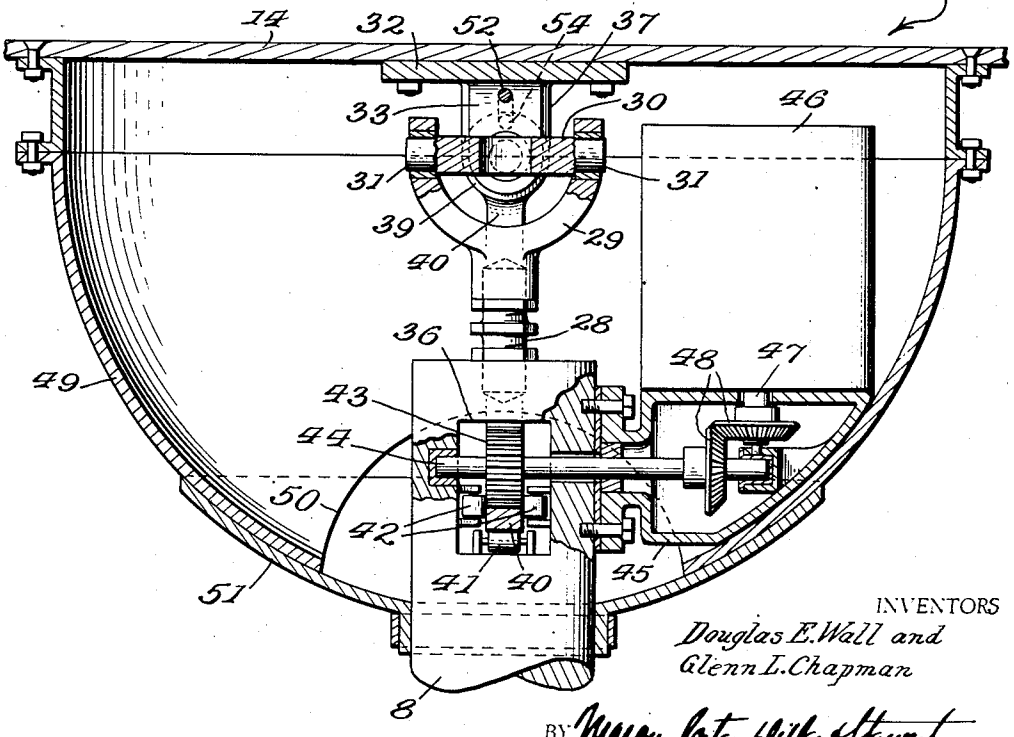


FIG. 4

FIG. 5



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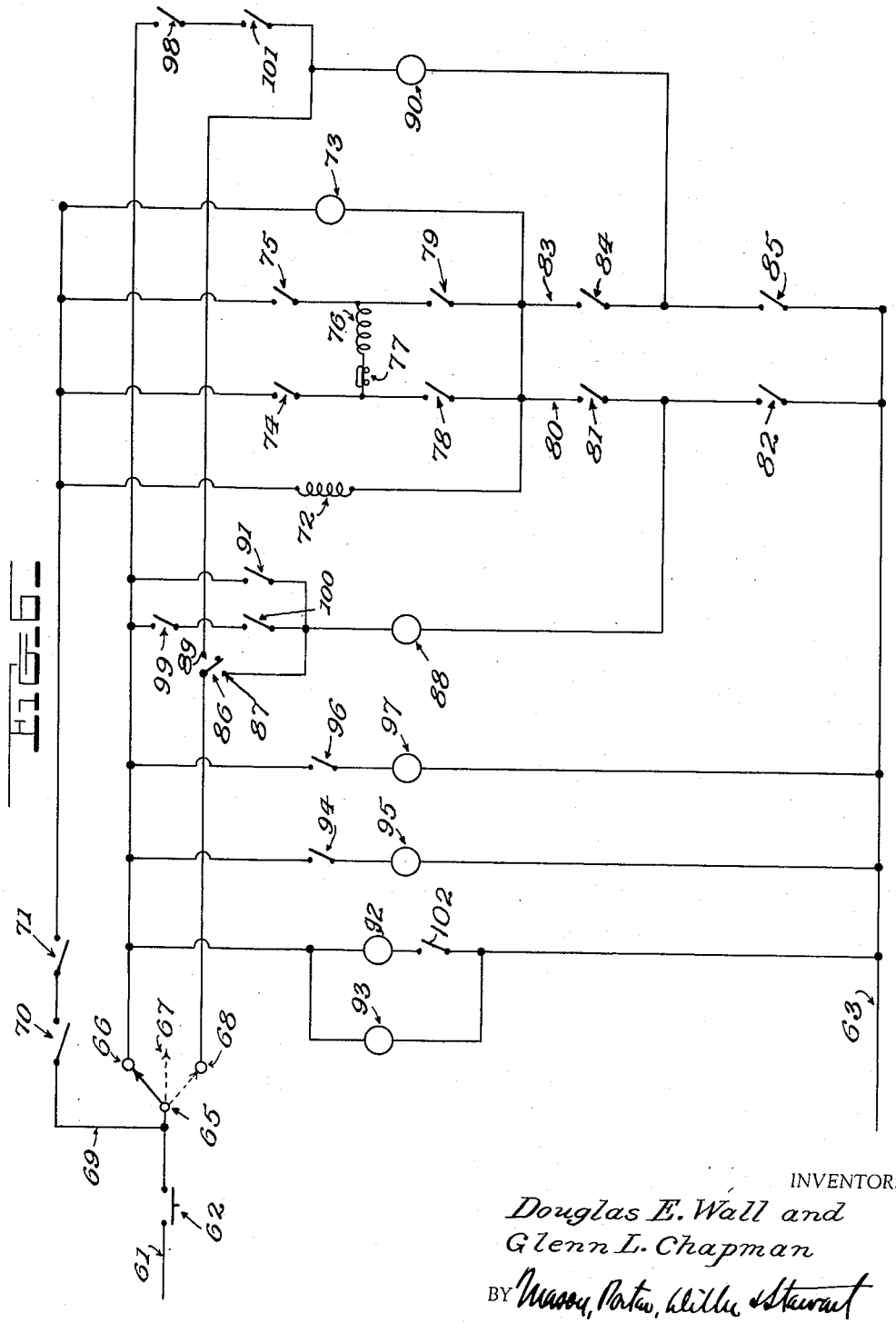
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MECHANICALLY CONTROLLED EMBALMING TABLE

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4 Claims. (Cl. 311—6)

The following specification relates to novel improvements in an operating and embalming table for use by undertakers in the preservation of human bodies; for use by physicians in certain types of medical operations; and for use by pneumonia patients as a therapeutic cure.

Preliminary to or incidental to the injection of embalming fluid in a corpse, it is necessary to drain any blood from the body. To do this adequately requires that the corpse be shifted in position to facilitate the proper drainage. The position must be tilted in opposite directions in order that the drainage be most effective.

It is an object of our invention to provide an operating table which can be rocked from side to side to facilitate the drainage of blood from the corpse.

Among the objects of our invention is to enable the embalmer to place the corpse in desired position for drainage without undue physical effort.

A still further object of the invention is to improve the sanitary control during the manipulation.

The invention will also be of advantage in handling bodies where the circulation must be aided due to circulatory block or collapse.

The preferred form of our invention is illustrated by way of example on the accompanying drawing in which:

Fig. 1 is a side elevation of the improved table;

Fig. 2 is an end elevation of the same in mid-position;

Fig. 3 is an end elevation showing the table tilted to one side;

Fig. 4 is a vertical section of the tilting and rocking mechanism taken on line 4—4 of Fig. 1;

Fig. 5 is a vertical section of the tilting and rocking mechanism taken at right angles of the plane of Fig. 4 and on the lines 5—5 of Fig. 4 and

Fig. 6 is a wiring diagram of the electrical circuits used.

Briefly described the invention consists in an embalming table which has means for holding the corpse firmly in position during both rocking and tilting movements of the table. The tilting movement is accomplished manually, while the rocking movement is manually or automatically controlled and is effected by a reversible electric motor. The operation of the motor is so controlled that the table may be rocked in either direction to the desired extent and then held in this rocked position for a desired period after which the table is rocked back through the middle horizontal position to the desired opposite inclination. The table may then be brought back to horizontal position by reversal of the motor circuits.

The invention also includes novel arrangement of electrical motor circuits and control circuits by which the table may be rocked in one direction, held in that position for a predetermined time, rocked in the other direction and held for a predetermined time, and then rocked back to the horizontal position without attention from the operator.

The above operations are illustrated by the preferred form of the invention as shown in the drawings in which 7 represents a central base of sufficient stability to support the table in any adjusted position.

A hydraulic pedestal 8 is mounted centrally of the base. It can be adjusted vertically by means of a foot-operated pedal 11. This vertical adjustment may bring the table from the normal height of 30 inches to approximately 42 inches so that the convenience of the operator is served.

A suitable lock 12 is provided to prevent the pedestal 8 from rotating on its vertical axis during use.

The table proper 13 has a flat bottom 14 with overhanging side and end walls 15.

The table at one end carries a neck block 16 which may be adjustable in height and position.

Along each side the table carries a series of brackets 17, 17. These brackets 17 carry shafts 18 which in turn support slides 19, 19. These slides are locked into suitable position by means of clamps 20, 20. The slides 19 carry transverse rods 21, 21 locked into position by means of clamps 22, 22. The inner ends of the rods 21 carry clamps 23, 23 which hold the corpse in the desired position.

An extension light 24 is mounted at the head end of the table.

Inlet 25 at the head end of the table is used to deliver water for suitably flushing the table top by means of a spray not illustrated. Drainage from the table is effected by outlet 26 at the opposite end of the table.

The tank 27 for embalming fluid is provided under one end of the table and suitable means are of course provided for the use of the fluid after the drainage is completed.

Referring to Figs. 4 and 5 it will be seen that the top of the pedestal 8 carries a screw-threaded bolt 28. This bolt supports a yoke 29 forming part of a universal joint. The cross member 30 of the universal joint is suitably journaled by the arms 31 in the ends of the yoke 29 in the plane of the vertical axis of the machine.

The bottom 14 of the table carries a depending plate 32 also in the longitudinal axis of the machine. Depending from the plate 32 is a pair of hangers 33, 33. These hangers are in a plane at right angles to the longitudinal axis or are transverse of the machine. The hangers form journals 34, 34 for one arm 35 of the cross member 30.

The member 31 permits rocking of the table from side to side while the member 35 permits tilting of the ends of the table.

The upper part of the pedestal is cut away as shown to provide a passageway 36 transverse of the table.

A pair of hangers or shackles 37, 37 are mounted depending from the bottom 14 of the table as shown in Fig. 4. These shackles are on opposite sides of the plate 32 and in transverse alignment with it.

Each pair of shackles has a pivot bolt 38, 38 on which is journaled the ends 39, 39 of the segmental gear 40. This gear is semi-circular and 180 degrees between the ends 39, 39. The gear is concentric with respect to the center defined by the bearing member 31 of the universal joint.

The gear 40 rests partly upon two rollers 41, 41 which are mounted on the pedestal within the passageway 36. Rollers 42 are mounted on opposite sides of the gear 40, also within the passageway 36. As shown in Fig. 5, these pairs of rollers serve to hold the gear 40 in a vertical plane in any adjusted position without binding.

A pinion 43 is fixed on the countershaft 44 journaled in the pedestal and passing through the passageway 36. This pinion meshes with the teeth of the segmental gear 40. By means of the pinion 43, the gear 40 may be given a partial rotation thus rocking the table and inclining it in one or the other direction.

The pedestal 8 carries a bracket 45 on one side. This bracket supports an electric induction motor 46 having a vertical shaft 47. The bottom end of the motor shaft 47 carries one miter gear 48 in mesh with a corresponding miter gear 48 on the countershaft 44.

The bottom of the table carries a fixed housing 49 which surrounds the top of the pedestal, the universal joint, the gear 40 and the motor and its supporting bracket. The housing is cut away diametrically as shown at 50 to allow clearance of the pedestal when the table is rocked or tilted in either direction.

A spherical shell 51 is bolted around the pedestal 8 below the housing 49. In this way the housing and shell form a protective shield for the operating parts.

Fig. 4 shows a latch bar 52 passing through aligned holes in the center hanger 33 and the side brackets 37, 37. One end of the rod 52 is extended as shown in Fig. 1 for an operating knob 53.

The ends 39 of the gear 40 are formed with a series

of circumferentially arranged recesses on one side. The adjacent sides of the hangers 37, 37 also have single holes correspondingly positioned. Offset pins 54, 54 are carried on the rod 52 so that they will pass through the holes in the sides of the brackets 37 and enter one of the recesses in the ends 39, 39. In this way the table when tilted may be locked into position.

The rod 52 carries a collar 55. Slightly spaced therefrom a bracket 56 depending from the bottom 14 surrounds the rod 52. A compression spring 57 between 55 and 56 will hold the pins 54 in locking position.

The base of the passageway 36 in the pedestal carries a stop 58 on each side. A pivoted switch roller 59 is carried on one side of the gear 40 while a companion switch roller 60 is likewise carried on the opposite side of the gear 40. The rollers 59 and 60 are spaced to engage the stops 58 when the gear has rocked the table 45 degrees from the horizontal.

The switch rollers 59 and 60 are provided with two circuit interrupting switches. These switches are so positioned that the inner one is opened when the rollers 59 and 60 have travelled inwardly an extent equal to a 45 degree rock for the table. As a safety precaution a second switch is opened if the travel is carried to 48 degrees.

Power for operating the table in its rocking movements is supplied by an electric circuit preferably 110 volts alternating current. One conductor 61 of the circuit has an overload circuit-breaker 62. The circuit has a return conductor 63.

Current is led to the control panel 64 which has a master switch 65. This is a three point switch having a terminal 66 for automatic operation, an intermediate "off" point 67 and a third terminal 68 for manual operation.

Between the circuit breaker and the switch 65 a branch conductor 69 forms a bus bar. This branch 69 has two normally closed limit switches 70. 71. Switch 70 is biased to closed position and operated by the contact on the gear when the latter has moved to an extreme position 48 degrees to the left of the horizontal. The corresponding switch 71 is operated from the other limit roller 60 when the table has been rocked to the right a maximum of 48 degrees.

The branch 69 is in circuit with the motor field coil 72.

There is also a lead from branch 69 to a magnetically released brake 73. The latter is released when the motor circuit is closed but otherwise holds the motor shaft from rotation.

Current is also drawn from branch 69 through a normally open contact switch 74, used when the rocking is to the right, and a normally open contact 75 used when the rocking is to the left.

Beyond the contacts 74 and 75 there is a shunt composed of a starting circuit 76 in series with a centrifugal switch 77.

A left contact 78 normally open extends beyond the right contact switch 74 while a second right contact 79 normally open, extends beyond the left contact 75. The branches of the motor field coil 72, the brake 73 and the open contacts 78 and 79 are joined together as shown in Fig. 6.

A branch 80 extends from the point of juncture through a normally open left contact 81, a normally closed limit switch 82 and thence to the return conductor 63. The limit switch 82 is controlled by roller 59 on the gear when the rocking has reached 45 degrees to the left.

The branch conductor 83 is in contact with the right contact 84, normally open. The current from 84 is led to a normally closed right limit switch 85 and thence to the return lead 63. The switch 85 is normally closed but opened by the roller 60 at the 45 degree limit of rocking to the right.

The circuits above described are used to effect manual operation by current from the branch 68. For this purpose a single-pole double-throw switch 86 is provided on the panel 64. This switch is biased to an off position. One pole 87 of the switch is used for rocking to the left through a contactor 88 which leads to the branch 80 between the normally open contact 81 and the normally closed limit switch 82.

The opposite pole 89 of the double throw switch 86 is connected by means of a contactor 90 to the branch 83 between the normally open contact 84 and the normally closed limit switch 85.

The operating circuit may be traced as follows.

By closing the double-throw switch 86 to pole 87, the motor field circuit 72, 82 is energized together with the starter 76 while the brake 73 is released. Coincidental with this operation the contacts 81, 78 and 75 operated by contactor 88 are closed. The motor operates in a direction to rock the table 45 degrees to the left when the limit switch 82 opens. If the table is carried beyond this point to an inclination of 48 degrees, then the safety stop switch 70 is opened.

The motor then is motionless, the brake is engaged and the table remains in this rocked position until the double-throw switch 86 is opened from pole 87 and closed to pole 89. Coincidental with this operation contactor 88 is de-energized and contacts 81, 78, and 75 are opened.

The current then flows through the right contactor 90 and the normally closed limit switch 85. Coincidental with this operation, the contacts 84, 79 and 74 operated by contactor 90 are closed.

The motor circuit is then traced through the branch contact 74 and the branch 83, until the limit switch 85 or safety switch 71 is opened and operates to arrest the motor. Coincidental with the opening of switch 85 or 71, the contactor 90 is de-energized opening contacts 84, 79, and 75. This restores all switches and contacts to their original position.

The double-throw switch 86 may be operated thus to rock the table in the desired direction and to be stopped at will.

Automatic operation of the rocking is effected through the branch 66 of the master switch 65. Branch 66 has (a contact 91, which is normally closed) an auxiliary relay 95. This delivers current to the left contactor 88. At the same time contacts 75, 78 and 81 on contactor 88 are closed and the current thus delivered to the return lead 63 through the normally closed limit switch 82. The table is then rocked until the contact roller 59 opens either switch 82 or 70.

In the meantime current flows from branch 66 to the timing relay 92 and its coil 93. Current through the timing relay normally returns to lead 63 as indicated. Operation of the relay establishes a dwell at the end of which it closes contact 94. This contact is connected between the branch 66 and the return lead 63. It has an auxiliary relay 95. Closing contact 94 opens the normally closed contact 91 and closes contact 101 on relay 95. This energizes contactor 90 closing contacts 84, 79, and 74.

The motor then moves the table to the right until the limit stop 85 opens, and contactor 90 de-energizes.

There follows a dwell for a time set by the timing relay 92. At the end of the selected time, contact 96 (on coil 93) leading from the branch 66 is closed, energizing an auxiliary relay 97. This in turn opens the normally closed contact 98 on branch 66, de-energizing contactor 90. At the same time a branch line from branch 66 through normally open switch 99 is closed. Contacts 98 and 99 are contacts on the auxiliary relay 97 and are controlled with the energizing of 97 as noted above. This branch also includes a normally closed center limit switch 100 which is tied into the left contactor 88. The motor then moves the table in a reverse direction rotating the table to the left due to the reversing of the starting field 76. The center limit switch 100 opens when the table is restored to horizontal. This de-energizes the left contactor 88. The table will remain in this position because both contactors are de-energized and the entire circuit is open. Further operation of the electrical timer 92 will open switch 102, this in turn opens contacts 94 and 96. This restores all contacts and relays to their original positions with the subsequent de-energizing of both auxiliary relays. The table will then repeat this cycle of operation as long as the master switch remains connected to branch 66.

Panel 64 on which the manually operated electric switches are mounted serves also for holding various instruments commonly used by the operator. Thus depending from the side panel are shown an electric hand vibrator 108, and electric spatula 103, an electric spray gun 104 and a hair dryer 109. From the end panel is an electric hair curler 105, an electric drill 106 and a water spray 107.

The arrangement above described in detail is effective to provide a table which may be adjusted to convenient height, will firmly hold the corpse and effectively drain

the latter in horizontal position or tilted in either lateral direction.

The operation can be controlled manually or can be made automatic through a complete cycle.

While we have illustrated the preferred form of our invention, this has been done by way of example merely, and the invention is to be limited only by the scope of the appended claims.

What we claim is:

1. An operating table comprising a central base, a pedestal on the base, a universal joint having a yoke mounted on the pedestal, a table, bearings beneath the longitudinal axis of the table midway of its length, a cross on the joint pivotally journaled in the said bearings and in the yoke, spaced side bearings beneath the table aligned with the universal joint, a segmental gear journaled in said side bearings, said pedestal having a transverse passageway through which the gear travels, a gear pinion transversely journaled in the passageway, a reversible motor mounted on the pedestal for rotating the pinion, each said gear having a series of recesses on one side of each end, a rod slidable through each side bearing, aligned holes in each side bearing and offset pins carried by said rod to pass through said holes and engage in the recesses of said gear ends.

2. An operating table comprising a central base, a pedestal on the base, a universal joint having a yoke mounted on the pedestal, a table, bearings beneath the longitudinal axis of the table, a cross on the joint pivotally journaled in the said bearings and in the yoke, spaced side bearings beneath the table aligned with the universal joint, a segmental gear journaled in said side bearings, said pedestal having a transverse passageway through which the gear travels, a gear pinion transversely journaled in the passageway, a reversible motor mounted on the pedestal for rotating the pinion, a stop on the pedestal at each end of the passageway and a circuit breaker carried near each end of the gear for engagement with one of said stops.

3. An operating table comprising a central base, a pedestal on the base, a universal joint having a yoke mounted on the pedestal, a table, bearings beneath the longitudinal axis of the table, a cross on the joint pivotally journaled in the said bearings and in the yoke, spaced side bearings beneath the table aligned with the universal joint, a segmental gear journaled in said side bearings, said pedestal having a transverse passageway through which the gear travels, a gear pinion transversely journaled in the passageway, a reversible motor mounted on the pedestal for rotating the pinion, stops on the pedestal, motor circuit interrupters carried on the gear for engagement with said stops, and manual operating switches to operate the motor in each direction.

4. An operating table comprising a central base, a pedestal on the base, a universal joint having a yoke mounted on the pedestal, a table, bearings beneath the longitudinal axis of the table, a cross on the joint pivotally journaled in the said bearings and in the yoke, spaced side bearings beneath the table aligned with the universal joint, a segmental gear journaled in said side bearings, said pedestal having a transverse passageway through which the gear travels, a gear pinion transversely journaled in the passageway, a reversible motor mounted on the pedestal for rotating the pinion, stops on the pedestal, motor circuit interrupters carried on the gear for engagement with said stops, a timing relay, circuit switches operated by the relay to rotate the pinion successively in opposite directions, and timing means to stop the pinion rotation for a predetermined period at each limit of gear travel, and a circuit interrupter operative when the gear returns to mid-position after a movement in each direction.

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