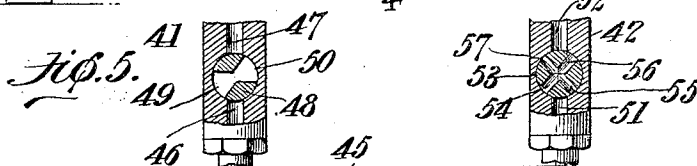
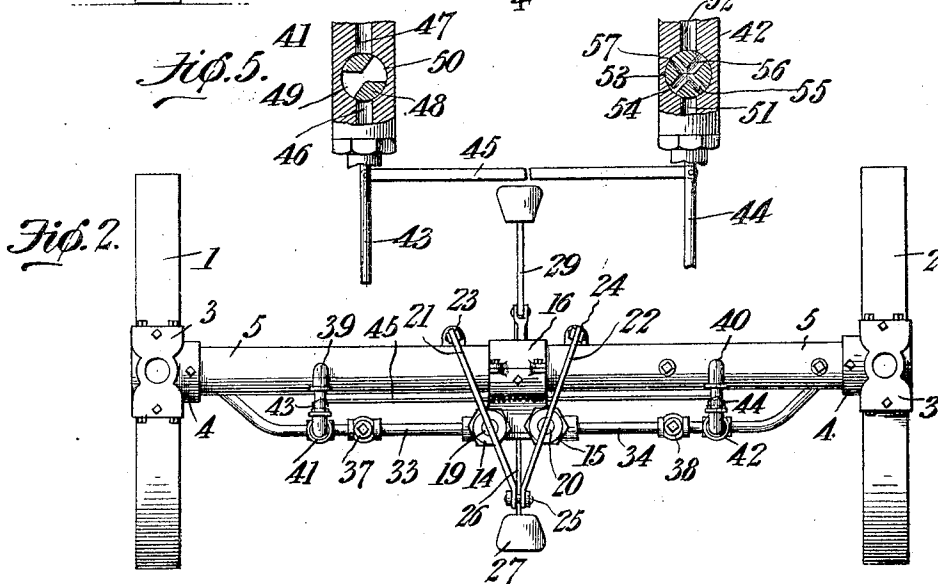
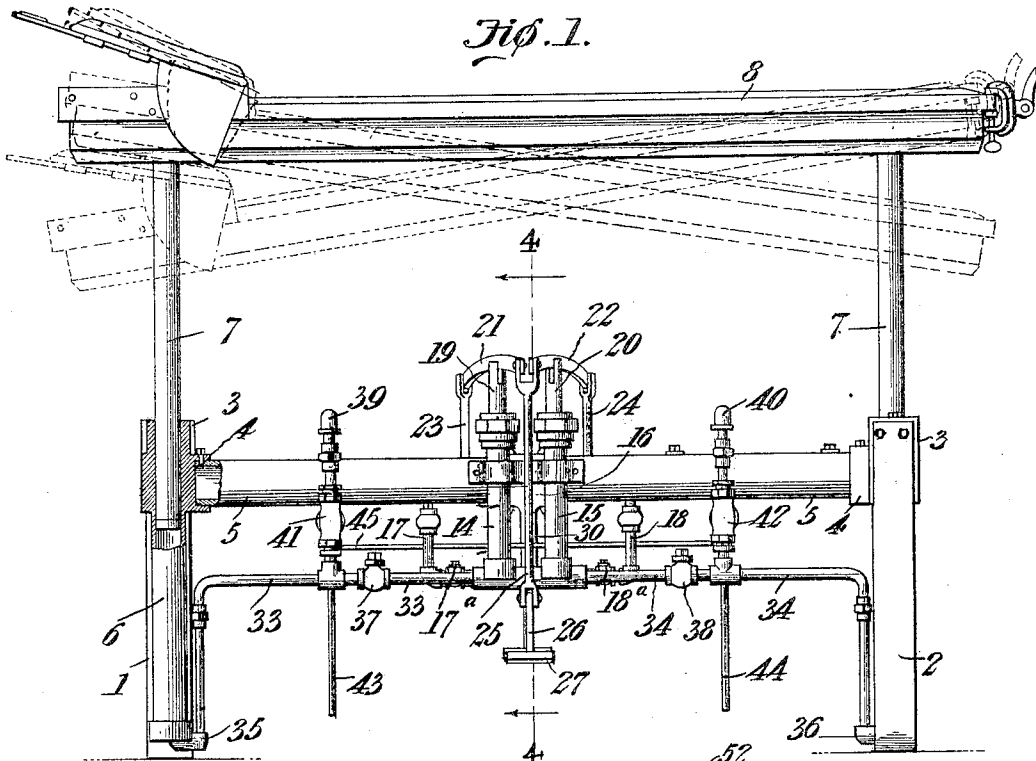


E. L. & E. B. VON ESCHEN.
SURGICAL TABLE.

APPLICATION FILED NOV. 17, 1904.

2 SHEETS—SHEET 1.



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Witnesses

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No. 804,784.

PATENTED NOV. 14, 1905.

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SURGICAL TABLE.

APPLICATION FILED NOV. 17, 1904.

2 SHEETS—SHEET 2.

Fig. 3.

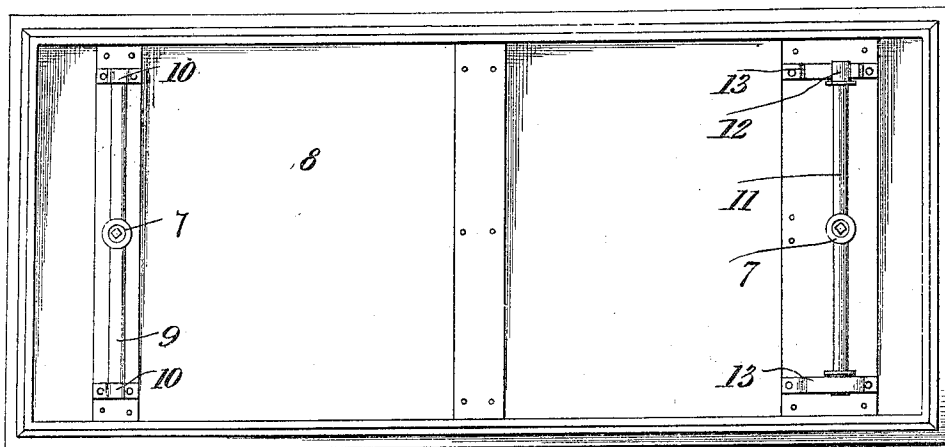
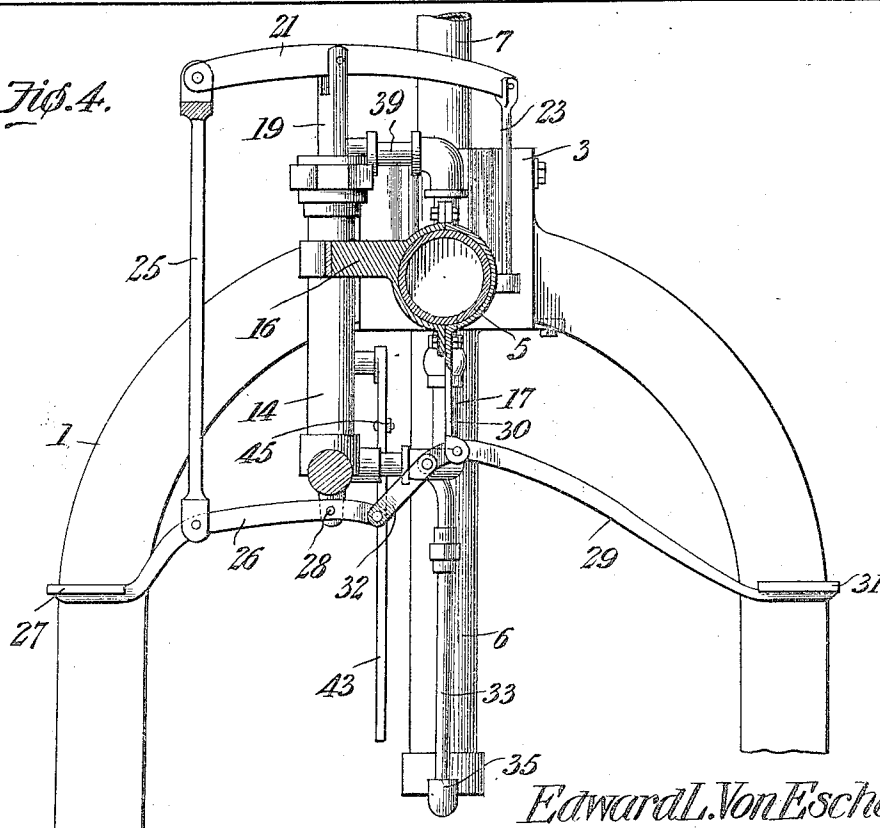


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD L. VON ESCHEN AND ELEANOR B. VON ESCHEN, OF KIRKSVILLE, MISSOURI.

SURGICAL TABLE.

No. 804,784.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed November 17, 1904. Serial No. 233,183.

To all whom it may concern:

Be it known that we, EDWARD L. VON ESCHEN and ELEANOR B. VON ESCHEN, citizens of the United States, residing at Kirksville, in the county of Adair and State of Missouri, have invented a new and useful Surgical Table, of which the following is a specification.

This invention relates to adjustable tables, and is designed to provide an improved table of this character especially adapted for use in performing surgical operations.

It is furthermore designed to provide for conveniently raising and lowering the table-top, so as to adjust the same to any desired height, and also to tilt the table to any desired inclination.

Another object of the invention is to employ hydraulic pressure for adjusting the position of the table-top and to have the hydraulic apparatus arranged for convenient control by the feet of the operator or of the attendants.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a surgical table embodying the features of the present invention. Fig. 2 is a top plan view of the base of the table with the top removed. Fig. 3 is an inverted plan view of the table-top. Fig. 4 is a detail sectional view on the line 4-4 of Fig. 1. Fig. 5 is a detail fragmentary sectional view illustrating the operation of the controlling-valves.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

The stationary base of the present table embodies two pairs of upwardly and inwardly arched or bowed leg-standards 1 and 2, the upper ends of each pair being received within the opposite open ends of a hollow bracket 3, to which they are rigidly connected in any suitable manner. A suitable seat or socket 4 is provided upon each bracket at the inner sides of the leg-standards, and a cylindrical tank or

reservoir 5 has its opposite ends rigidly fitted in the seats and fluid-tight therein, whereby the pairs of leg-standards are rigidly connected to form a stationary base. An upright cylinder 6 is located between the members of each pair of leg-standards and has its upper end open and secured within the adjacent hollow bracket 3, with a cylindrical piston 7 received within and projected above the open top of the cylinder to form a standard for the support of the table-top 8. By reference to Fig. 3 of the drawings it will be noted that the upper end of one of the standards is provided with a cross-head in the form of a rod or bar 9, which has its opposite ends journaled in suitable bearing-brackets 10, secured to the under side of the table-top, whereby said top is capable of being tilted vertically upon the cross-head of the standard. As shown in Fig. 3, the other standard is also provided with a cross-head 11, having terminal antifriction-rollers 12 mounted therein and working in the slots of longitudinally-slotted brackets 13, secured to the under side of the table-top, whereby the cross-head 11 is capable of working in said slotted brackets during tiltable movements of the table-top, as will hereinafter appear.

As hereinbefore indicated, it is proposed to employ hydraulic pressure for elevating the table-top, oil preferably being the fluid employed and contained in the supply tank or reservoir 5, from which it is designed to be pumped to the cylinders 6 for raising the standards or pistons 7 mounted therein, and thereby to elevate the table-top. To force the oil from the supply-pipe 5 to the cylinders, there is a pumping apparatus made up of a pair of upright pump-cylinders 14 and 15, located substantially midway between the ends of the supply-tank and connected thereto by means of a suitable bracket 16, which embraces the tank and is rigidly secured thereto. Supply-pipes 17 and 18 lead from the bottom of the tank to the bottoms of the respective pump-cylinders and are each provided with check-valves 17^a and 18^a, respectively, to prevent the return of oil from the pumps to the supply-tank. The plunger-rods 19 and 20 of the pumps project through the tops of the pump-cylinders and are each pivotally connected to intermediate portions of vertically-swinging levers 21 and 22, which diverge toward one side of the table and have their di-

verged ends fulcrumed upon suitable supports 23 and 24, rising from the supply-tank 5. The converged ends of the levers are pivotally connected to the forked upper end of an end-wise-movable and vertically-disposed connecting-rod 25, and a foot-lever 26 is intermediately connected to the lower end of the rod, the outer end of the foot-lever being provided with a foot-piece 27 and the rear portion of the lever being intermediately fulcrumed, as at 28, between the lower ends of the pump-cylinders. To provide for operating the pump from the opposite side of the table, there is another foot-lever 29, which is intermediately fulcrumed upon a suitable support 30, depending from the bracket 16. The outer end of the lever 29 is provided with a foot-piece 31, and its inner end is connected to the inner end of the first-mentioned foot-lever by means of a link 32. Service-pipes 33 and 34 lead in opposite directions from the respective pump-cylinders 14 and 15 and have their outer ends connected to the bottoms of the respective cylinders 6, as at 35 and 36, respectively, said pipes being provided with check-valves 37 and 38, located adjacent the respective pumps to prevent return of oil through said pipes to the pumps. Return-pipes 39 and 40 lead from the respective service-pipes at points between the check-valves thereof and the adjacent cylinders 6 to the supply-tank, and these return-pipes are provided with cut-off valves 41 and 42, respectively, the turning plugs of which have pendent handles or levers 43 and 44, with a connecting-rod 45 extending between the two levers to connect them for simultaneous movements in the same directions.

To elevate the table-top in a horizontal position, the pumping apparatus is operated by manipulating either or both of the foot-levers 26 and 29, thereby to force oil from the tank 5 to the respective cylinders 6, thereby to elevate the standards or pistons 7 and in turn elevate the table-top in a horizontal position. During this adjustment of the table-top the check-valves 17^a and 18^a prevent the return of fluid into the supply-tank 5, while the check-valves 37 and 38 prevent the return of fluid from the cylinders 6, whereby the table-top is held in an elevated position. It will here be noted that the table-top is elevated through the direct application of hydraulic pressure upon the standards of the table-top, thereby securing a regular and effective adjustment of the top without jarring or otherwise disturbing the patient who may be upon the table.

Upon reference to Fig. 5 of the drawings it will be noted that the valve-casing 41 is provided with an inlet-port 46 and a diametrically-opposite outlet-port 47, while its turning plug 48 is provided with diametrically-opposite inlet and outlet ports 49 and 50, each of which is substantially twice as long as the corresponding ports of the valve-casing. The valve-casing 42 is provided with diametrically-

opposite inlet and outlet ports 51 and 52, and its turning plug 53 is provided with a pair of inlet-ports 54 and 55 and a pair of outlet-ports 56 and 57. When it is desired to lower the table-top bodily in a horizontal position, the lever 44 is moved to the right to bring the ports 54 and 56 of the turning plug 53 into alinement with the respective ports 51 and 52 of the valve 42, the lever 43 of course being moved simultaneously with the lever 44 through the medium of the connecting-rod 45, thereby bringing the ports 49 and 50 of the turning plug 48 into alinement with the ports 46 and 47 of the valve 41, whereby communication is opened from each of the cylinders 6 back through the respective pipes 33 and 34, the valves 41 and 42, and the passages 39 and 40 to the oil-tank 5, whereby the table-top will be bodily lowered in a horizontal position. To lower the right-hand end of the table-top independently of the left-hand end thereof, the lever 44 is moved to the left, thereby turning the plug 53 so as to bring its ports 55 and 57 into alinement with the ports 51 and 52 of the valve-casing 42, thereby establishing communication between the right-hand cylinder 6 and the tank 5 through the passage 34, the valve 42, and the passage 40, which permits the right-hand end of the table-top to gravitate to any desired position, which may be controlled by bringing the lever 44 to an upright position, so as to close both valves. In this latter manipulation of the valve 42 it will be noted that the valve 41 remains closed, so as to prevent the return of oil from the left-hand cylinder 6, and thereby maintain the left-hand end of the table-top in its elevated position. To lower the left-hand end of the table-top independently of the right-hand end, the lever 44 is swung quickly to the right, so as to move the port 54 of the turning plug 53 to the opposite side of the inlet-port 51 of the valve-casing 42, which maintains the latter valve in closed condition; but the inlet-port 49 of the turning plug 48 of the valve-casing 41 being at least twice as long as the adjacent inlet-port 46 said port 49 remains in communication with the port 46, and thereby establishes communication from the left-hand cylinder 6 back to the tank 5, so as to permit of gravitation of the left-hand end of the table-top, while the right-hand end remains in its elevated position.

In connection with the lowering of the table-top it will be noted that the valve 42 is capable of being opened by movements of the lever 44 in opposite directions from an intermediate upright position of the lever, while the other valve is capable of being opened by a movement of its lever in one direction only, whereby the table-top may be bodily raised and lowered, and either end may be lowered independently of the other to tilt the table-top. Furthermore, as the levers 43 and 44 are connected by the rod 45 both of the valves

may be controlled by manipulation of either lever.

It will here be explained that the table-top is hinged or pivoted to the cross-head 9 to permit of the tilting of the table-top during the lowering of either end thereof, and the opposite end of the table-top is provided with a slidable and hinged connection with the other standard to accommodate for the increased distance between the top ends of the standards when either of the latter is lowered.

From the foregoing description it is apparent that the hydraulic apparatus of the present invention is carried by the stationary base of the table, and the supply-tank 5 forms a rigid connection for the leg-standards and a support for the pumps, the several pipes communicating between the supply-tank, the pumps, and the cylinders, and also for the levers which are employed for actuating the pumps. By this arrangement the several elements of the hydraulic apparatus are entirely independent of the table-top and are not affected by the adjustment thereof, wherefore the table-top may be entirely removed from the base without interfering with the hydraulic apparatus. Moreover, the device is complete in itself and may be bodily moved without interfering with any of the several connections.

Having thus described the construction and operation of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an adjustable table, the combination with opposite legs, of a supply-tank, cylinders carried by the legs, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, a pump in communication with the tank, service-pipes leading from the pump to the respective cylinders, and means for exhausting one of the cylinders independently of the other cylinder to effect tilting of the table-top.

2. In an adjustable table, the combination with a support, of fluid-pressure cylinders carried thereby, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, and means for exhausting one of the cylinders independently of the other to tilt the table-top.

3. In an adjustable table, the combination with a support, of fluid-pressure cylinders carried thereby, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, and means for simultaneously exhausting the cylinders to lower the table-top and for exhausting one of the cylinders independently of the other cylinder to tilt the table-top.

4. In an adjustable table, the combination with opposite leg-standards, of a supply-tank

supported by and connecting the same, cylinders carried by the leg-standards, plungers working in the cylinders with their stems rising thereabove and constituting standards, a table-top carried by the standards, a pump in communication with the tank, service-pipes leading from the pump to the respective cylinders, and return-pipes leading from the respective service-pipes to the supply-tank and including cut-off valves.

5. In an adjustable table, the combination with opposite leg-standards, of a supply-tank supported by and connecting the same, cylinders carried by the leg-standards, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, a pump in communication with the tank, service-pipes leading from the pump to the respective cylinders, return-pipes leading from the service-pipes to the tank and including cut-off valves, and a connecting-rod extending between the two valves for simultaneous manipulation thereof.

6. In an adjustable table, the combination with opposite leg-standards, of cylinders carried thereby, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, a supply-tank, a pump in communication with the tank, service-pipes leading from the pump to the respective cylinders, return-pipes leading from the service-pipes to the tank, and mutually-connected cut-off valves included in the service-pipes and constructed for simultaneously opening in one direction of movement from an intermediate point, and for opening one of the cut-off valves in the opposite direction of movement.

7. In an adjustable table, the combination with a base, of a pair of cylinders, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, a supply-tank, a pump in communication with the tank, service-pipes leading from the pump to the cylinders, return-pipes leading from the service-pipes to the tank and including cut-off valves, and means connecting the valves for simultaneous action, one of the valves capable of being opened in opposite directions from an intermediate closed position and the other valve capable of being opened in one direction only, whereby the table-top may be bodily raised and lowered and one end lowered independently of the other to tilt the table-top.

8. In an adjustable table, the combination with a base, of a pair of cylinders, plungers working in the cylinders with their stems constituting standards, a table-top carried by the standards, a supply-tank, a pump in communication with the tank, service-pipes leading from the pump to the cylinders, return-pipes leading from the service-pipes to the tank and including cut-off valves, controlling-levers for the respective valves, and means connecting

the levers for simultaneous movement by manipulation of either lever, one of the valves capable of being opened by movements of its lever in opposite directions from an intermediate closed position and the other valve capable of being opened by a movement in one direction only of its lever.

9. In an adjustable table, the combination with opposite leg-standards, of a supply-tank carried by and connecting the leg-standards, upright cylinders carried by the leg-standards plungers working in the cylinders and having their stems rising thereabove to constitute standards, a table-top carried by the standards, an upright pump carried intermediately by the tank, a supply-pipe leading from the tank to the pump and including a check-valve, a lever fulcrumed upon the tank and connected to the plunger-rod of the pump, a foot-lever fulcrumed upon the tank, a connecting-rod extending between the two levers, service-pipes leading from the pump to the cylinders and including check-valves, return-pipes leading from the service-pipes at points between

the check-valves thereof and the respective cylinders to the tank, cut-off valves included in the return-pipes, levers for the respective cut-off valves, and a rod connecting the levers for simultaneous movements.

10. In an adjustable table, the combination with a support, of a pair of fluid-pressure cylinders, plungers working in the cylinders and having their stems constituting standards, a table-top carried by the standards, and controlling means for simultaneously exhausting the cylinders in one direction of movement of said means from an intermediate point and for exhausting one of the cylinders in the opposite direction of movement of said controlling means.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

EDWARD L. VON ESCHEN.
ELEANOR B. VON ESCHEN.

Witnesses:

N. E. WINN,
V. J. HOWELL.