

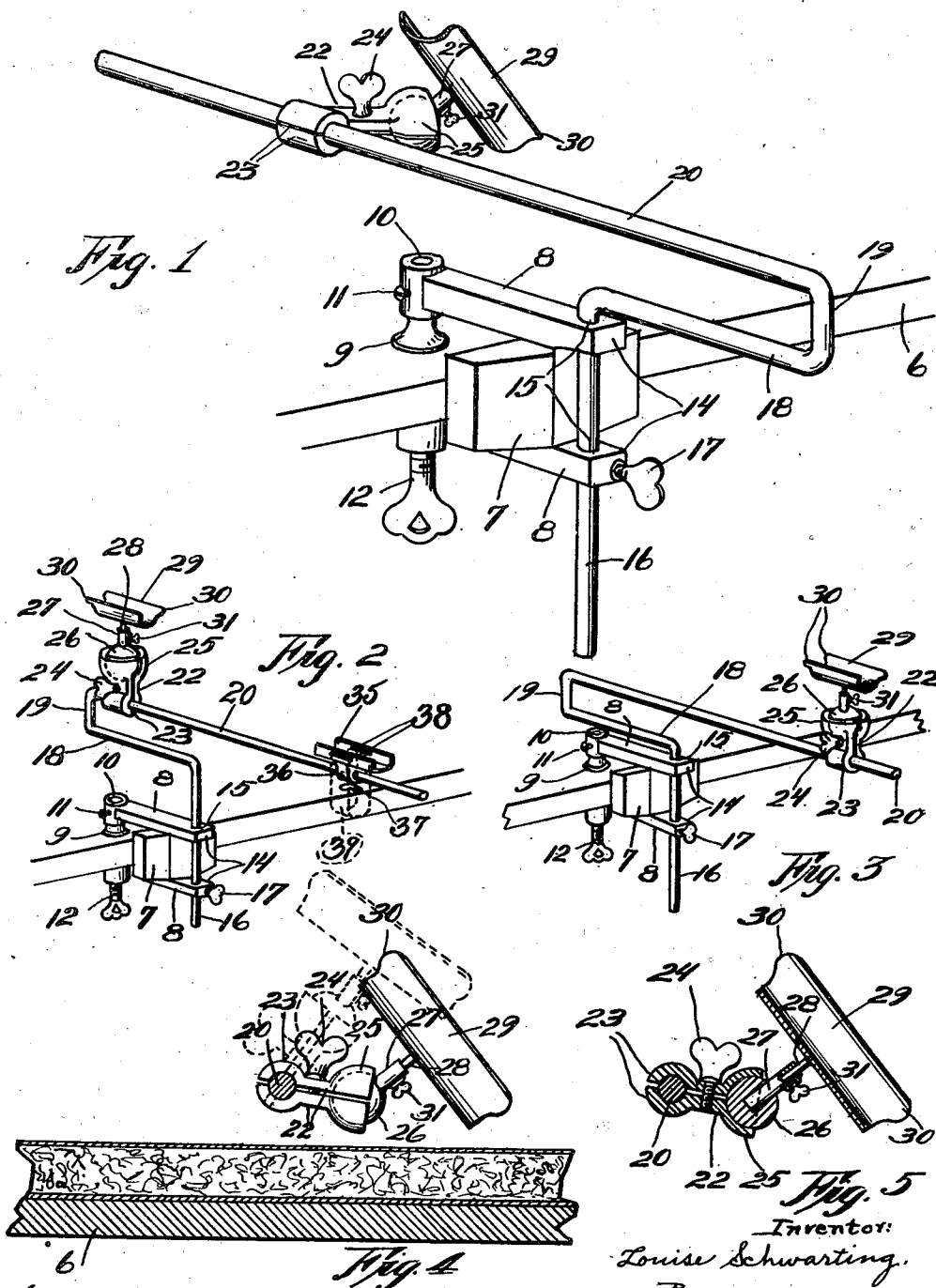
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L. SCHWARTING

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LIMB SUPPORT FOR OPERATING TABLES

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LIMB SUPPORT FOR OPERATING TABLES.

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To all whom it may concern:

Be it known that I, LOUISE SCHWARTING, a citizen of the United States, and resident of St. Joseph, county of Buchanan, State of Missouri, have invented a certain new and useful Improvement in Limb Supports for Operating Tables, of which the following is a complete specification.

The present invention relates to limb supporting devices for operating tables used in surgery, and aims to provide a novel and improved limb engaging and supporting means adapted to facilitate the proper positioning of a patient upon the table and the comfortable maintaining of such position for the period of time consumed by the operation.

To this end I have devised a practical and efficient supporting structure designed for fulfilling the necessary supporting and bracing functions, and also having provision for ample adjustment to meet the varying requirements of different types of operations necessitating different positions of the patient and corresponding changes in the application of the supporting means.

It is also sought to provide an improved device of few and comparatively simple parts which may be easily manipulated and adjusted, and also be manufactured at relatively small cost.

With these general objects in view, the invention will now be described by reference to the accompanying drawing illustrating one form of construction which I have devised for embodying the proposed improvements, after which those features deemed to be novel will be particularly set forth and claimed.

In the drawing—

Figure 1 is a perspective view of a limb supporting structure embodying the present improvements and shown in operative relation to a table;

Figures 2 and 3 are similar views on a smaller scale and illustrating different operative positions of the device;

Figure 4 is an enlarged sectional elevation illustrating one position of adjustment of the limb rest to bring the same close to the table, the dotted lines representing another position of adjustment; and

Figure 5 is a sectional detail view of the

limb rest and its connections to the supporting arm.

Referring now to the drawing in detail, this illustrates the improved supporting device in its relation to an operating table, indicated at 6, to one edge of which the device is adapted to be securely clamped in position. For this purpose, a portion of the device comprises a bracket structure, including a block element 7 provided with a pair of spaced, parallel arms 8, so arranged that the block element 7 may be engaged with the edge of the table 6, with the arms 8 extending above and below the latter, as illustrated in Figures 1 to 3. The upper arm 8 carries a suitable clamping element 9, the stem portion 10 of which is secured to the end of the arm 8 by means of a clamping screw 11, while the inner end of the lower arm 8 is fitted with a thumb-operated clamping screw 12 for engagement with the under surface of the table.

The bracket structure is further provided with spaced parallel lugs or projections formed as outward extensions from the arms 8 and having registering openings 15 for adjustably and rotatably accommodating the vertical shank portion 16 which forms a part of the adjustable limb supporting structure proper. The lower lug or projection 14 carries a thumb-operated clamping screw 17, whereby the shank 16 may be securely held in any position to which it may be set.

The upper end of the shank 16 carries a laterally extending arm 18, to which is connected, as by means of a short vertical arm 19, one end of a horizontal supporting arm 20 extending parallel to the arm 18. As will be seen in Figures 1 to 3, that end portion of the arm 20 which is connected to the arm 18 forms with the latter a relatively short arm extending in one direction from the shank 16, while the remaining portion of said arm 20 forms a materially longer supporting arm projecting in a direction opposite from that of the arm 18. The supporting structure just described thus assumes the general outline of the letter "T," with one of its lateral arms longer than the other, and either of which may be swung into overlying relation to the table 6, and also adjusted to different elevations above the table.

For supporting and adjusting the limb

rest with relation to the horizontal supporting arm 20, I provide a pair of clamping elements 22 forming a split clamping member having split bearing portions 23 adapted for releasable engagement with the arm 20, the middle portions of the clamping elements 22 being provided with a thumb screw 24 for effecting the clamping action of the elements. These elements 22 are also formed with a split spherical bearing structure 25 for receiving and supporting a spherical bearing member 26 which carries a post 27 having its outer end provided with a socket for accommodating the stem 28 projecting from the middle portion of the limb rest 29, as shown in Figure 5. This limb rest 29 is constructed of an approximately semi-cylindrical shell affording a concave limb supporting surface, the sides of the member 29 projecting slightly past its longitudinal middle portion at the ends of the rest, as indicated at 30, this being for a purpose hereinafter explained. The stem 28 of the limb rest is secured to the post 27 by means of a clamping screw 31. By means of the described connections between the limb rest 29 and the arm 20, it is apparent that the limb rest is adapted to be supported at any point along said arm, including that end of the arm which extends adjacent to and parallel to the arm 18, on account of the clearance afforded by the connecting portion 19; it is also apparent that the limb rest supporting connections may be adjusted angularly about the longitudinal axis of the arm 20, and by virtue of the universal joint structure afforded by the bearing parts 25 and 26, the limb rest may also be adjusted at any supplementary angle which may be required, different positions of adjustment being illustrated in Figures 1, 2 and 4.

As has already been stated, the shank 16 carrying the supporting arm 20 may be rotated within the bracket structure to bring either end of said arm 20 into overlying relation to the table 6, and said shank adjusted to different elevations within the lugs 14. In Figure 1, this adjustment has been so made as to bring the longer end portion of the arm 20 above the table 6, and the shank 16 lowered within the bracket so as to bring the arm 20 close to the top surface of the table. The position of the limb rest 29 shown in Figure 1 is that designed for engagement with the thigh of a patient, as, for example, in amputation of the limb above the knee, the thigh being elevated at an angle from the hip of the patient. In such operations, it is desirable frequently to locate the limb rest as close to the hip as possible, which makes apparent the necessity for the supplemental angular adjustments of said limb rest, as indicated in Figure 4, these adjustments

enabling the limb rest to be not only tilted at the required angle for conforming to the inclination of the limb, but also permitting the limb rest to be positioned as close to the table surface as may be required. The dotted lines in Figure 4 simply represent an intermediate position of adjustment of the limb rest or support, to illustrate the adjustable character of the device. In the case of an operation for amputation below the knee, the limb rest would be positioned about as indicated by the full or unbroken lines in Figure 4, but at a slightly lower angle to the table and the whole supporting structure would be shifted toward the foot of the table.

The adjustment of the supporting structure illustrated in Figure 2 is that designed for use in connection with kidney or posterior chest wall operations. The supporting arm 20 is rotated about the axis of the shank 16 to bring the shorter end portion of said arm into overlying relation to the table 6, in addition to which said arm is elevated by raising the shank 16 through the openings 15 to whatever height is required for accommodating the size of the patient. In such operations the patient is placed on his side, facing outwardly or away from the table and that arm which is then uppermost is supported by the limb rest 29, the latter being shifted toward the end of the loop formed between the arms 18 and 20 and hence into supporting position in engagement with the patient's arm adjacent his shoulder. As before, any slight angular adjustments of the limb rest 29 may now be made for the convenience of the patient, whose arms are both extended outwardly in the direction of the free end of the arm 20. In this operation of the device, I use a supplemental limb rest member 35 of approximately concave form, the under side of which is provided with a lug 36 having an opening whereby the member may be slipped over the free end of the arm 20, as shown, and secured thereto by a clamping screw 37. The sides of the member 35 are provided with slots 38 to permit a suitable hand sling or bandage (as indicated by dotted lines at 38 in Figure 2) to be looped therethrough into depending relation beneath the arm 20. By this means a convenient support is provided for accommodating the outer extremities of both arms in the most comfortable manner, the upper hand being carried in the limb rest member 35 and the other being securely retained in the sling 38 beneath said rest member, and said supporting means being easily adjusted for arms of different length. The construction of the arm 20 with the loop portion at its shorter end is such as to leave said arm unobstructed from end to end, and thereby permits the limb rest 29 to be

freely shifted into either of the positions illustrated in Figures 2 and 3. The adjustment of the support to bring the shorter or loop end of the arm 20 over the table also allows the patient to be located nearer to the edge of the table without interfering with the use of the remaining portion of said arm 20 for supporting the outwardly extended arms and hands of the patient. In this use of the device, the same serves to support the patient in proper position, keeping him from rolling forward or backward, and, what is more important, relieves the respiratory muscles of the weight of the arm and shoulder supported by the device, thus insuring that the patient's respiration will remain free and easy. In practice, the supporting structure is adjusted and the patient allowed to place himself in that position which is most comfortable to him before the anæsthetic is administered; this not only insures the adjustment of the device into the position best suited to the patient, but also obviates the necessity of lifting him into the required position and any movements necessary to complete the proper positioning of the patient after he has passed under the influence of the anæsthetic, which is not only an inconvenient and difficult procedure but one that actually necessitates a deeper anæsthesia.

The use of the device where the patient is placed in a supine position, as for axilla or breast operations, is illustrated in Figure 3. The support is again adjusted as low as possible by lowering the shank 16 in the bracket, and the limb rest 29 is shifted toward the outer free end of the arm 20 for supporting the out-stretched arm of the patient. In this case it is also evident that the rest member 29 may, if desirable, be adjusted forward, backward or angularly to any extent which may serve to bring the rest into that position best suited to the needs of the patient.

In both types of operations for which the device is illustrated in Figures 2 and 3, the support of the arms and hands in out-stretched position by the outer end of the arm 20 is of importance in such work, since this operates to prevent any constriction of the blood vessels in the arms, such as tends to take place when the arms are simply allowed to hang with the elbows bent at more or less of an angle.

The recesses formed by the projections 30 at the ends of the limb rest adapt the same to conform to the limb better than would straight edges at these points by tending to equalize the pressure over the blood-vessels and tendons and avoiding stagnation of circulation and subsequent soreness at the points of support; also by affording a more effective retaining engagement with the arm this construction (when used in the posi-

tion indicated in Figure 2) not only serves to keep the arm from falling out of the rest but also securely holds the patient (who is lying on his side) from rolling or swaying either forward or backward.

It will thus be seen that I have devised a simple, practical and efficient construction for embodying the proposed features of improvement, and while I have illustrated what I now regard as the preferred form of embodiment of the invention, I desire to reserve the right to make all such changes or modifications as may fairly fall within the scope of the appended claims.

What I claim is:

1. A limb supporting structure for operating tables comprising a bracket adapted for attachment to the table, a horizontal supporting arm having a shank portion vertically adjustable within said bracket and also rotatable therein about a vertical axis to permit said arm to be swung horizontally into different positions over the table, a supporting element carried by said arm and adjustable longitudinally thereon and also angularly with reference to the horizontal axis of said arm, means for fixedly securing said element in any of its adjusted positions, a limb rest carried by said supporting element and adjustable thereon angularly in any direction, and clamping means independent of said first means for fixedly securing said limb rest in any of its angular positions relative to said supporting element.

2. A limb supporting structure for operating tables comprising a bracket adapted for attachment to the table, a supporting member of approximately T-form having its upright portion vertically adjustable within said bracket and also rotatable therein about a vertical axis to permit either end of said horizontal portion to be swung into various different positions overlying the table, a supporting element carried by said horizontal portion and adjustable longitudinally along the entire length of said horizontal portion and also angularly with reference to the horizontal axis of said portion, means for fixedly securing said supporting element in any of its adjusted positions, a limb rest carried by said supporting element and adjustable thereon angularly in any direction, and means for fixedly securing said limb rest in any of its angular positions relative to said supporting element.

3. A limb supporting structure for operating tables comprising a bracket adapted for attachment to the table, a supporting member of approximately T-form having its upright portion adjustably mounted in said bracket and adapted to permit either end of the horizontal portion of said member to be swung into position overlying the table, and a limb rest adjustably mounted on the horizontal portion of said supporting member,

said upright portion of the supporting member being provided with a connection to one of the ends of said horizontal portion and leaving the latter clear for unobstructed shifting of said limb rest from one end of said horizontal portion to the other.

4. A limb supporting structure for operating tables comprising a bracket, adapted for attachment to the table, a supporting member comprising an upright portion adjustably mounted in said bracket, a laterally extending arm and a horizontal supporting arm having one end thereof connected to the outer end of said laterally extending arm and in spaced and parallel relation thereto, the connected end of said supporting arm forming with said laterally extending arm a loop materially shorter than the remaining portion of said supporting arm, said supporting member being rotatable in said bracket to permit either end of said support-

ing arm to be swung into position overlying the table, and a limb rest mounted adjustably on said supporting arm.

5. A limb supporting structure for operating tables comprising a bracket adapted for attachment to the table, a horizontal supporting arm carried by said supporting bracket and adapted to be swung either into overhanging relation to said table or outwardly away from the table, and a limb rest comprising an elongated, approximately semi-cylindrical shell mounted on said supporting arm, one of the end edges of said shell being inwardly curved from top to bottom of the rest, thereby forming side projections extending beyond the central lower portion of the rest.

In witness whereof I hereunto affix my signature.

LOUISE SCHWARTING.