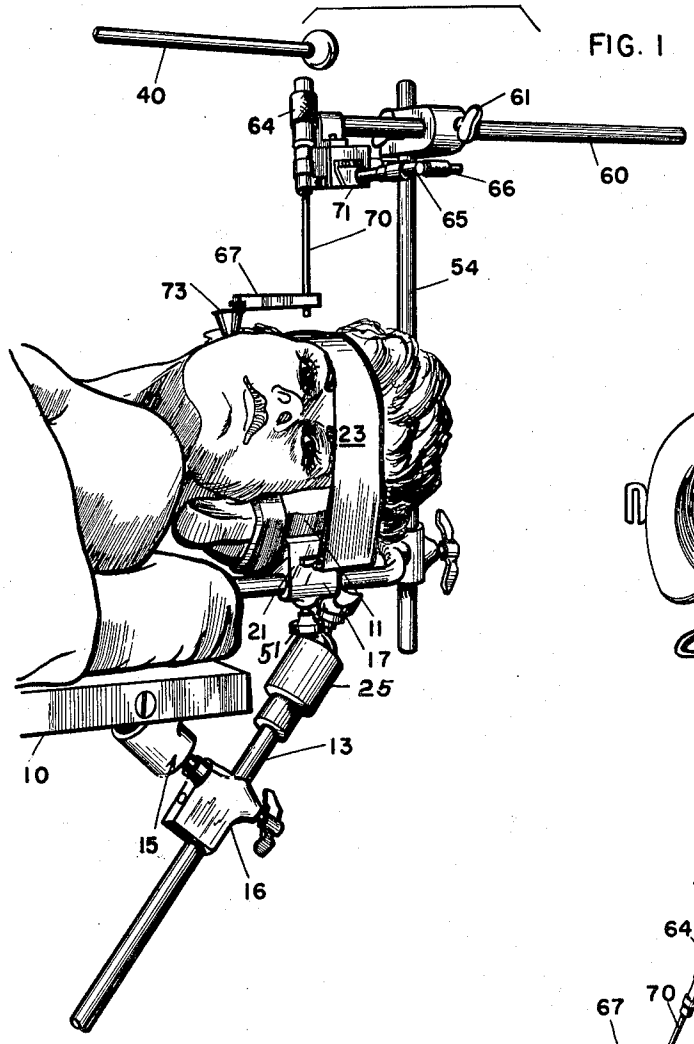
June 8, 1965 C. H. BOETCKER ETAL 3,188,079

SURGICAL HEADREST

Filed April 5, 1962 2 Sheets-Sheet 1

FIG. 1



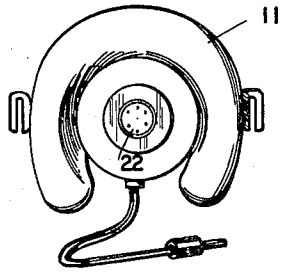


FIG. 3

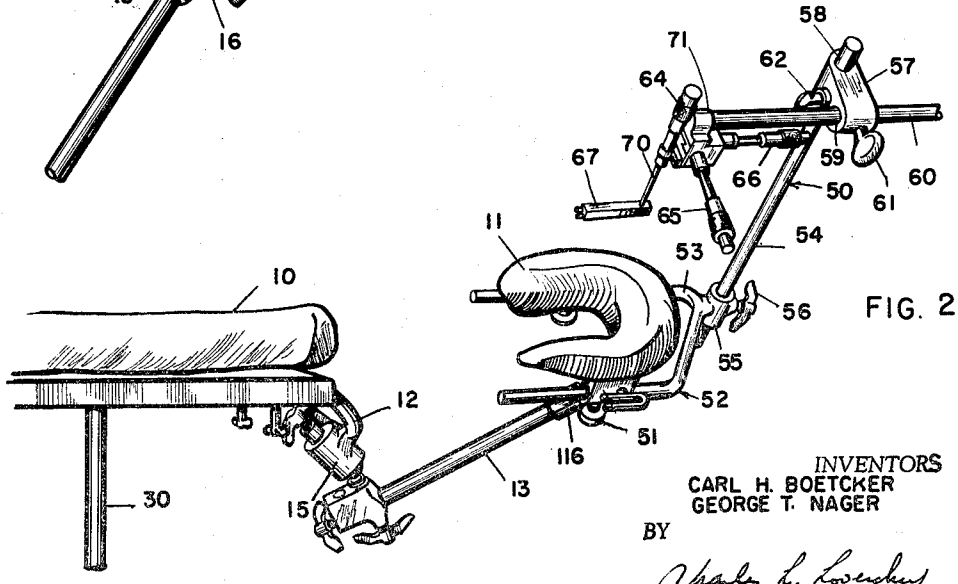


FIG. 2

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Filed April 5, 1962 2 Sheets-Sheet 2

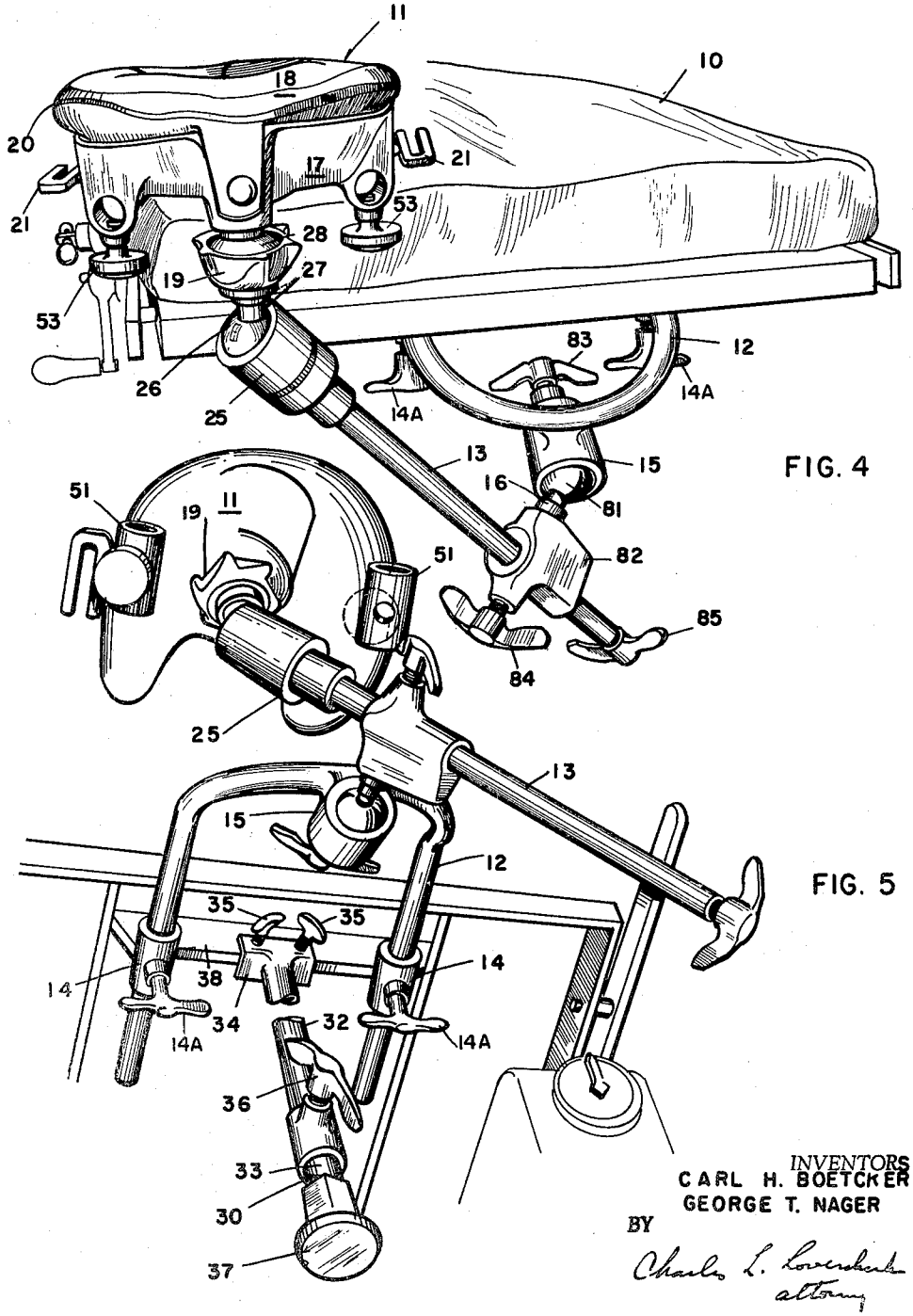


FIG. 4

FIG. 5

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SURGICAL HEADREST

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14 Claims. (Cl. 269—328)

This invention relates to headrests and, more particularly, to head holders suitable for use in combination with operating tables in modern micro-surgery of the ear and other exacting operations on the head.

A head holder to fulfill the requirements of present day micro-surgery of the ear has to be simple, stable, versatile, and safe as well as affording comfort to both patient and surgeon. Literature and experimentation with available head holders reveal that several prior head holders meet some of the requirements but none are entirely satisfactory.

It is, accordingly, an object of the present invention to provide a new and improved headrest unit.

Another object of the invention is to provide an improved headrest unit which will support the head of a person in rigid, convenient, comfortable, versatile, and safe positions for surgery.

Still another object of the invention is to provide an improved head holder in combination with an operating table.

A further object of the invention is to provided an improved head holder in combination with an instrument supporting device.

It is a further object of the invention to provide an improved head holder in combination with an operating table and a stabilizer therefor.

Yet a further object of the invention is to provide an improved headrest for operating tables which satisfies the needs of modern surgery and which will fit most of the operating tables now in general use.

Still a further object of the invention is to provide a head holder which is simple in construction, economical to manufacture, and simple and efficient to use.

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

In the drawings:

FIG. 1 is a view of an operating table with a head holder shown thereon in use with a patient's head shown immobilized and the anesthetist's screen in position for placing drapes;

FIG. 2 is a side view of the operating table with the head holder and attaching stand for the micro-manipulator placed thereon and the telescopic stabilizing bar for the table;

FIG. 3 is a top view of the head holder with the ear phone in position thereon according to the invention;

FIG. 4 is an isometric view taken from the end of the operating table with the head holder shown thereon; and

FIG. 5 is an isometric view of the undersurface of the end of the operating table showing the telescoping vertical stabilizer bar and the method of attaching the head holder to the operating table.

Now with more specific reference to the drawings, the headrest disclosed herein is shown supported on an operating table 10 which may be one of the types of operating tables familiar to those skilled in the art of hopsital equipment. The table has a head portion which can be disposed in a horizontal position as shown in FIGS. 1 and 4

or it can be swung to an inclined position. In addition to the equipment provided with the table 10, an additional stabilizing bar indicated at 30 is shown attached to the table to hold it positively in the position shown in FIGS. 1, 2, and 4.

The headrest unit consists of three principal components:

(1) A U-shaped bar 12 which may be made of steel;
(2) A straight bar 13 which may also be made of steel; and
(3) A contoured aluminum head support 18.

These three components are connected by means of ball joints having provision to lock them positively and rigidly in position and are of the type sometimes referred to as hydraulic ball joints. They are of the type shown, for example, in Patent No. 2,966,383.

The U-shaped bar 12 is disposed with its straight arms in sleeves 14 which, when on the head of the operating table, are in the back section. When in the foot end of the table, the sleeves 14 will be welded to a bar 38 on the undersurface of the foot section of the table and have set screws 14A which may be tightened to engage the legs of the bar 12. The sleeves 14 and set screws 14A constitute a lock. The arch of the U-shaped bar 12 has a slight bend downward which permits placing the patient's head in a slightly overhanging position.

A hydraulic universal ball joint with a shell 15 is fixed to the arch of the U-shaped bar 12. This joint has a ball 31 fixed to a bracket 32 by an extension 16. A hand screw 33 can be tightened to lock the ball 31 in position. The bracket 32 has a bore which slidably receives the bar 13. A hand screw 34 may be tightened to lock the bar 13 against sliding in the bracket 32. A handle 35 is used to lock a ball 26 in the manner illustrated in the said patent. The screw 34 may be loosened to adjust the straight bar 13 to any desired height.

The combination of ball joint and lock makes it possible to fix the upper end of the straight bar 13 (which carries the head support) in position with it above or below the plane of the top of the table 10. The combination of the ball joint and lock further makes it possible to move the upper end of the straight bar 13 with the head support thereon toward or away from the end of the table, to displace it sideways from one corner of the table and to the other, or to move it in any intermediate oblique direction.

The ball 26 is fixed to a base 27 on which is contained a lock nut 19. By unscrewing the lock nut 19, the upper part of a headrest assembly 17 may be removed for cleaning. This also allows adaptation for various other types of headrest having the same mounting post as at 28.

The head support

The head support 18 consists of two parts; namely, the headrest assembly 17 and a rubber mattress pad 11. The metal headrest assembly 17 is generally U-shaped with the arms and arch broad and the upper aspect concave to adapt to the contours of the lateral aspect of the skull of a human being. Thus, the headrest assembly 17 is a trough like horseshoe form which has been found to be more desirable than a ring shaped form since it is designed to avoid pressure upon nerves and vessels in the neck of a person. It also permits good access to the undermost ear during an operation.

The sponge rubber mattress pad 11 is detachable from the frame which supports it. The pad has a conductive rubber cover which is closed by a zipper 20. Conductive rubber is rubber containing an additive such as metal filings which renders it electrically conductive. The zipper 20 may be opened in order to change the sponge rubber pad. The zipper opening is protected from seepage by suitable flaps. Altering the amount and position of the

sponge rubber inside the pad 11 makes it possible to adjust the cushion to any size and configuration of skull. Generally, however, adjustment of the sponge rubber inside the pad will not be necessary.

U-shaped forks 21 are provided which have one leg of the U fixed to the headrest assembly 17. These forks may be integral with the assembly 17 or they could be attached thereto by welding, brazing, or the like. The forks 21 can be used to attach a head restraining strap 23 or they may be used as adhesive holders thereby to tie the patient's head firmly to the head support. This provides a stable adjustment of the patient's head in any desired position.

At times, it may be desirable to test the cochlear function during an operation under local anesthesia; for instance, during a certain stage of an operation on the oval window of the ear. Determination of the hearing acuity in the exposed ear usually requires that the opposite undermost ear be masked at appropriate intensity levels. For this purpose, an ear phone 22 is provided which fits exactly into the center of the head support 18. This ear phone can be inserted and removed with ease during a surgical procedure. The ear phone is best shown in FIG. 3 and fits snugly in the center of the head support.

The head support 18 may be used with advantage in connection with an anesthetist's screen which is shown at 40. The screen 40 will generally have a radius of action of three hundred sixty degrees and be adjustable in height. It will be suitable to attach to any part of the operating table.

The table stabilizer

Absolute immobility of the headrest unit is at all times required when, for instance, a minute manipulation is performed on an important structure of the middle ear under high magnification or when a micro-manipulator is used during a surgical procedure. A vertical stabilizer shown in FIG. 5 can be used in connection with the headrest unit. The stabilizer 30 has a telescopic bar 32 which telescopically receives a bar 33. The two bars are locked together when the desired position is reached by means of a clamp screw 36. The bar 33 has a suitable foot 37, such as a resilient buffer, made of conductive rubber on the lower end thereof for engaging a floor.

The telescopic bar 32 has a bracket 34 fixed to the upper end thereof. The bracket 34 has a slot which receives a transverse bar 38 fixed to the frame of the operating table. Clamp screws 35 are threadably received in one leg of the U-shaped bracket 34 and clamp the stabilizing support securely to the bar 38. This simple stabilizer gives the surgeon unobstructed access to the operative site, whether he is sitting or standing. It eliminates any movement of the operating table and headrest.

Micro-manipulator

In the event that a micro-manipulator is used during an operative procedure to record, for instance, microphonics and action potentials from the cochlear nerve, the headrest unit is designed in such a way that a micro-manipulator stand can be attached quickly, firmly, and with ease at any phase of an operation. The stand of the micro-manipulator 50 fits into locks 51 which are on the undersurface of the head support. Thus, the stand becomes a solid unit with the head support 18 and, once adjusted, it can be moved together with the patient's head into any desired position.

The micro-manipulator support is made up generally of a U-shaped bar 52 which has an arch 53. The U-shaped bar 52 has legs which are slidably received in the bores in the headrest assembly 17 and are held in locked position therein by means of suitable studs 51.

A sleeve 55 is fixed to the arch of the U-shaped bar 52. A straight rigid bar 54 is telescopically received in a bore in the sleeve 55 so that the bar 54 can be slidably adjustable up and down therein and locked in position by a handle 56. A bracket 57 has two bores 58 and 59 disposed at ninety degrees to each other. A straight bar 60 is slidably received in the bore 59. It may be locked in position by means of a thumb screw 61 while the bar 54 is slidably received in the bore 58 and may be locked against sliding movement by means of a thumb screw 62.

A micro-manipulator bracket 71 is fixed to the distal end of the bar 60 and micrometer adjustment handles 64, 65, and 66 are fixed to the bracket 71. Supports 67 and 70 can be moved with precision to any desired position by manipulating the handles 64, 65, and 66. The micro-manipulator 50 may be moved up and down or horizontally by adjusting the bracket 57 on the bars 54 and 60. An ear funnel 73 can be supported on the support 67.

Summary

Practically every aural surgical procedure may be performed using the headrest disclosed herein under general as well as local anesthesia and on both children and adults. The unit is simple, versatile, stable, and safe, besides affording comfort for both patients and surgeons. Immobility of the operating table and patient's head is required for a very delicate manipulation under high magnification of the operating microscope.

The vertical stabilizer can be attached with ease and provided with immediate immobility. Thus, the headrest unit may be used for the recording of cochlear microphonics and nerve action potentials when cochlear functions are tested at certain stages of a surgical procedure. If masking of the opposite ear is required, the ear phone can be quickly and easily attached and the head support with the inserted ear phone and its rubber cap can be used to cover and protect the undermost ear very satisfactorily.

While the headrest unit is intended for aural surgery, it is very useful for certain neurosurgical procedures and for operations on the nose, paranasal sinuses, trachea, and larynx. It is possible to design the table and headrest unit so that they will have a minimum elevation of, for example, twenty-seven inches which enables the surgeon to sit comfortably, experiencing minimum fatigue during long hours of minute work with the operating microscope. Only minor changes are necessary to attach the headrest unit to any operating table model. The headrest unit may be attached to either end of the usual operating tables.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In combination, a headrest and an operating table, said table having a locking means fixed thereto with laterally spaced bores therein, a U-shaped bar having its legs received in said bores of said locking means, the arch of said U-shaped bar extending from said table, a universal joint attached to said arch, means to lock said universal joint to render it rigid, a bore member fixed to said universal joint, an elongated straight bar slidably received in the bore of said bored member, means to lock said straight bar against sliding and rotating movement in said bore of said bored member, and a headrest support base, said support base being fixed to one end of said straight bar.

2. The combination recited in claim 1 wherein said headrest support base has laterally spaced, horizontally extending bores therein, a second U-shaped bar having its legs received in said bores in said base, support means on the arch of said second U-shaped bar for supporting a first rod, said first rod supported on said support means, a bracket having a first bore and a second bore disposed at ninety degrees to each other, a second rod disposed in said second bore, and a medical treating device supported on the distal end of said second rod.

3. The combination recited in claim 1 wherein a rigid

support member is fixed to said headrest base and extends upwardly therefrom, a support bar swingably and rotatably supported on said rigid support member, means to lock said support bar rigidly to said support member, means to attach an instrument to said support bar, and micrometer means on said support bar to move said instrument relative to said support bar.

4. The combination recited in claim 3 wherein said rigid support member comprises spaced bores in said headrest base, a second U-shaped bar received in said spaced bores in said headrest base, means to lock said second U-shaped bar in said spaced bores in said base, a sleeve fixed to said second U-shaped bar, an upright rod slidably received in the bore in said sleeve, means to rigidly lock said upright rod in said bore of said sleeve, a bracket having a first and a second bore disposed at approximately ninety degrees to each other, said support bar and said upright bar being received in said bores in said bracket, and means to rigidly lock said support bar and said upright rod in said bores.

5. In combination, a headrest and an operating table, said table having a locking means fixed thereto with laterally spaced bores therein, a U-shaped bar having its legs received in said bores of said locking means, the arch of said U-shaped bar extending from said table, said U-shaped bar arch being bent slightly downwardly and disposed below the top surface of said table, a first universal joint attached to said arch, means to lock said first universal joint to render it rigid, a bored member fixed to said first universal joint, an elongated straight bar slidably received in the bore of said bored member, means to lock said straight bar against sliding movement in said bore of said bored member, a headrest support base, said headrest support base being a generally horseshoe shaped plate, the upper side of said plate being contoured generally to the shape of the side of a human skull, and a second universal joint fixedly connecting said support base to one end of said straight bar.

6. The combination recited in claim 5 wherein said first universal joint comprises a sleeve fixed to said U-shaped bar, a ball, said ball being fixed to a bracket.

7. The combination recited in claim 6 wherein said second universal joint comprises a second ball, a second sleeve, and means to lock said second ball rigidly with respect to said second sleeve.

8. The combination recited in claim 5 wherein a quick disconnect joint is provided and said headrest base is attached to said second universal joint by means of a said quick disconnect joint.

9. The combination recited in claim 8 wherein said headrest base has a rigid fork fixed to each side thereof for receiving a strap or the like.

10. A headrest for use on an operating table comprising a headrest base, said base being generally U-shaped and having a concave upper surface, and means for attaching said headrest base to an operating table, said means for attaching said base to said table rigidly supporting said base selectively at a plurality of positions spaced to the head of, to the side of, above, and below said table, a support for an instrument on said headrest, said support for said instrument comprising a support rod and an upright rod, means for adjustably and rigidly locking said support rod and said upright rod together, means rigidly locking said upright rod to said headrest, and micrometer means to support said instrument on said support rod, said micrometer means comprising means to move said instrument in small micrometer movements in three planes.

11. In combination, an operating table, a headrest, and a stabilizer, means to adjustably support said headrest on said operating table whereby said headrest can be rigidly positioned above, below, or to either side of the top of said table, a stabilizing bar, said stabilizing bar comprising a first and a second part telescopically connected together, said table having a head portion swingably attached thereto to adjust said head portion relative to said table, and means to lock said first and second parts together, said first part having an end adapted to engage a floor, said second part having means thereon connecting said stabilizing bar to said table at a position intermediate the sides thereof.

12. The combination recited in claim 11 wherein said headrest is in the form of a U, said headrest having a mattress supported thereon shaped to generally conform to the side of a human head, said legs of said U being adapted to receive the neck of a person therebetween.

13. The combination recited in claim 12 wherein an ear phone is attached to said headrest intermediate said legs.

14. A headrest for an operating table, said headrest having a generally horseshoe shaped mattress supported thereon, and means to support said headrest on an operating table selectively above, below, or to the side thereof, a generally round disk shaped ear phone supported on said headrest between the legs thereof and below the top surface thereof whereby the side of a human head can rest on said mattress with the ear and neck overlying the space between the legs of said horseshoe shaped mattress.

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