

April 22, 1952

D. P. SMITH

2,594,086

TABLE SUPPORTED ABDOMINAL RETRACTOR

Filed April 29, 1950

3 Sheets-Sheet 1

FIG. 1

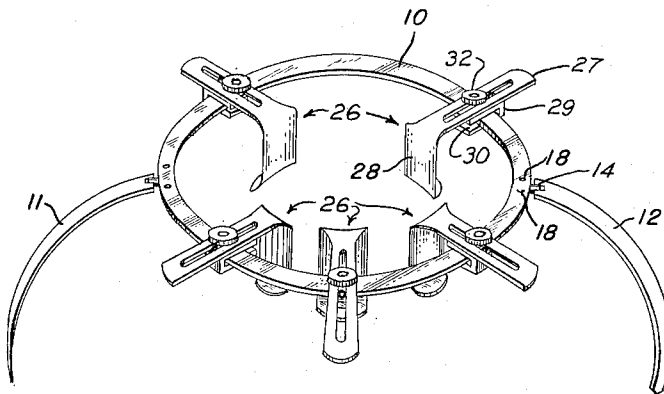
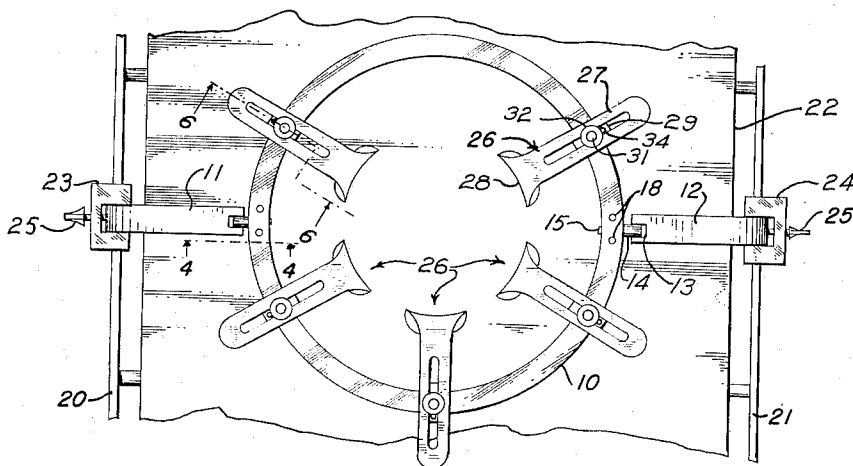


FIG. 2



INVENTOR:
DAVID P. SMITH

BY
H. G. Manning
ATTY.

April 22, 1952

D. P. SMITH

2,594,086

TABLE SUPPORTED ABDOMINAL RETRACTOR

Filed April 29, 1950

3 Sheets-Sheet 2

FIG. 4

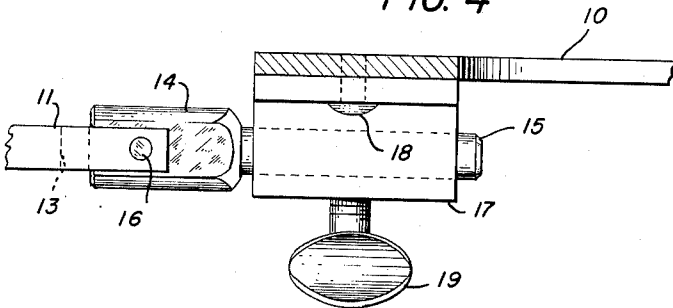


FIG. 5

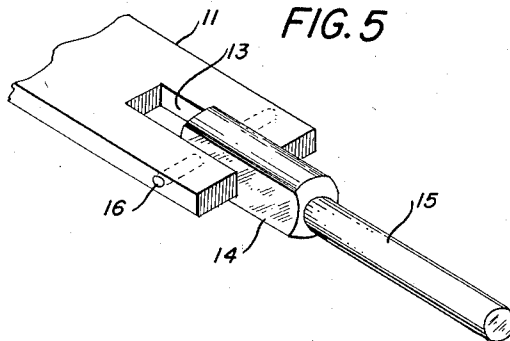
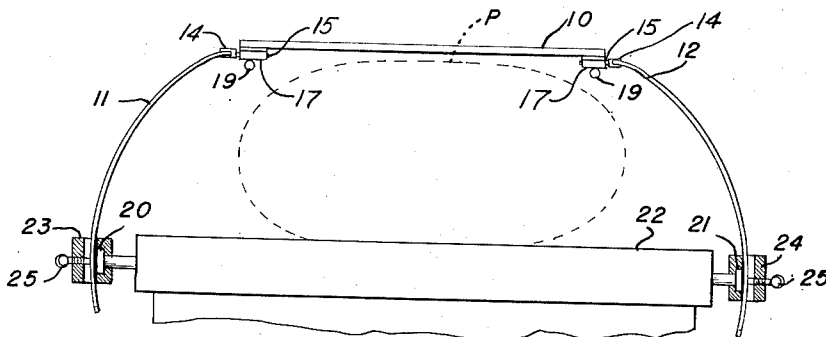


FIG. 3



INVENTOR:

DAVID R. SMITH

BY

H. G. Manning

ATTY.

April 22, 1952

D. P. SMITH

2,594,086

TABLE SUPPORTED ABDOMINAL RETRACTOR

Filed April 29, 1950

3 Sheets-Sheet 3

FIG. 6

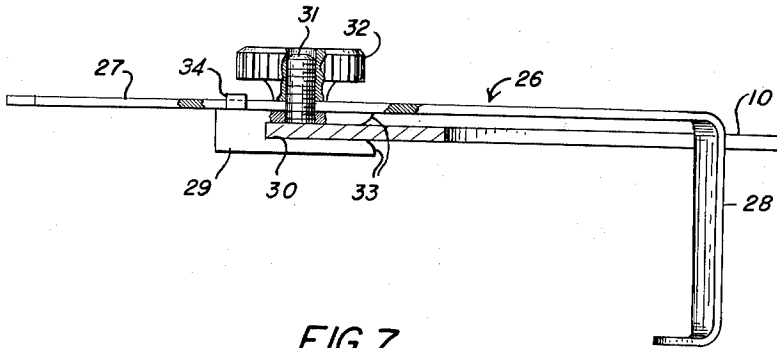


FIG. 7

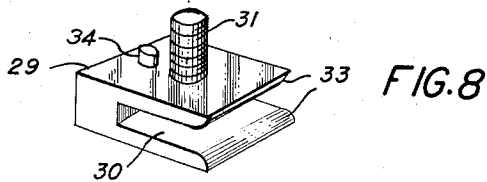
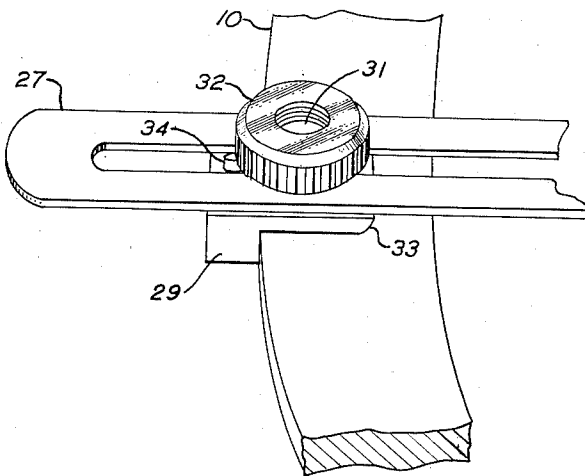


FIG. 8

INVENTOR:
DAVID P. SMITH
BY *H. G. Manning*
ATTY.

UNITED STATES PATENT OFFICE

2,594,086

TABLE SUPPORTED ABDOMINAL
RETRACTOR

David P. Smith, Meriden, Conn.

Application April 29, 1950, Serial No. 158,981

6 Claims. (Cl. 128—20)

1

This invention relates to surgical retractors and more particularly to an abdominal retractor which comprises means for firmly supporting a plurality of independently adjustable retracting elements above an operating table so as to hold the edges of a wound and the viscera or other organs away from the field of operation.

One object of this invention is to provide a retractor of the above nature in which the retracting elements do not depend upon each other or upon their engagement with the patient for their proper support, thus avoiding movement of the retracting elements which might cause shock to the patient and which would be a source of annoyance to the surgeon.

Another object is to provide a retractor of the above nature which may be employed to retract any part of the wound or the organs therein in one direction without requiring the retraction of another part in the opposite direction.

Another object is to provide a retractor of the above nature in which, if desired, the retracting elements may all be adjusted as a unit in both horizontal and vertical directions.

Another object is to provide a retractor of the above nature in which each of the retracting elements may be easily adjusted either radially or circumferentially of the wound at any time without disturbing the positions of any of the other retracting elements.

Another object is to provide a retractor of the above nature which may be readily installed, adjusted, and removed, and which will not be likely to change its adjustment accidentally, whereby the retractor will require a minimum of attention from the operating surgeon and the minimum number of assistants will be required.

A further object is to provide a retractor of the above nature which will be simple in construction, inexpensive to manufacture, easy to install and manipulate having universal adjustment, and very efficient and durable in use.

With these and other objects in view there has been illustrated on the accompanying drawing one form in which the invention may conveniently be embodied in practice.

The invention herein disclosed constitutes an improvement in the retractor disclosed in my copending application entitled "Self-Supporting Surgical Retractor, S. N. 92,602, now Patent Number 2,586,488 granted February 19, 1952, filed May 11, 1949, in respect to the hinged side supporting arms and the circumferential adjustability of the retractor elements, not shown in said copending application.

2

In the drawing,

Fig. 1 is a perspective view of the improved retractor.

Fig. 2 is a plan view of the same as it would appear when attached to the side rails of an operating table.

Fig. 3 is a front view of the same, showing the retractor as it would appear when the retracting elements are removed, and showing the side rail clamps in cross-section.

Fig. 4 is a fragmentary view, on an enlarged scale, taken on the line 4—4 of Fig. 2, showing the manner in which the side arms are connected to the ring.

Fig. 5 is a partial perspective view showing an end portion of one of the side arms and the pivot pin therein.

Fig. 6 is a cross-sectional view on an enlarged scale, taken substantially on the line 6—6 of Fig. 2, showing the manner in which the retracting elements are attached to the supporting ring.

Fig. 7 is a fragmentary perspective view of the same.

Fig. 8 is a perspective view showing one of the slotted brackets for attaching the clamping elements to the supporting ring.

Referring now to the drawing, in which like reference numerals denote corresponding parts throughout the several views, the improved retractor comprises a supporting ring 10 which is of flat circular shape and of uniform rectangular cross-section. In order to support the ring 10, provision is made of a pair of outwardly-extending side arms 11, 12, the inner end of each of said side arms being formed with a notch 13 in which the enlarged flat-sided base 14 of a pivot pin 15 is swingably secured by means of a horizontal cross pin 16.

The lower surface of the supporting ring 10 is provided at diametrically opposite points with a pair of lugs 17 which are apertured in a direction radially of said ring and attached thereto by means of rivets 18. The lugs 17 are adapted to receive the pivot pins 15 which may be firmly secured therein by thumb screws 19.

The side arms 11, 12 are curved outwardly and downwardly from the pivot pins 15 and are adapted to be attached to the side rails 20, 21 of an operating table 22 by means of a pair of C-shaped clamps 23, 24. The clamps 23, 24 are so shaped as to be freely slidable in a longitudinal direction upon the side rails 20, 21 and are vertically apertured in such a manner that the side arms 11, 12 may be adjustably held therein and se-

curely clamped against the outer faces of the side rails 20, 21 by thumb screws 25.

In order to hold a wound open and retain the internal organs of the body away from the field of operation, provision is made of a plurality of angular retracting elements 26, each of which comprises a longitudinally slotted horizontal upper base portion or arm 27, and a depending concave hook portion 28 at one end of said arm. Each of the retracting elements 26 is provided with a U-shaped bracket 29 in the form of a flat rectangular block having a deep rectangular slot 30 in one edge thereof, and a threaded stud 31 attached to its upper surface.

The stud 31 extends upwardly through the slot in the retractor arm 27 and is provided with a knurled thumb nut 32, whereby each of the retracting elements 26 may be adjustably clamped to its respective U-shaped bracket 29.

The slots 30 are adapted to receive the outer edge of the ring 10 and are so proportioned that the brackets 29 will be slidable circumferentially on said ring. Further, the slots 30 have divergent outer end surfaces 33 which will facilitate the application of the brackets to said ring 10.

In order to prevent any substantial turning movement of the U-shaped brackets with respect to the retracting elements 26, the upper surface of each of said brackets is provided with a short upstanding pin 34 engaged in the slot of the arm 27 adjacent the threaded stud 31.

Manner of use

In use, the retractor herein disclosed will be applied to the operating table 22 after the patient P has first been prepared for the operation and is resting on said table in the position indicated in dotted lines in Fig. 3.

The first step in applying the retractor will be to insert the lower ends of the pair of side arms 11, 12 into the C-shaped clamps 23, 24 which embrace the side rails 20, 21, after which the thumbscrews 25 will be tightened so as to clamp said side arms securely against said rails.

It will be noted that the curvature of the side arms 11, 12 will permit the supporting ring 10 to be swung either to the right or to the left prior to the tightening of the thumb screws 25, this movement being obtained by inserting the side arms 11, 12 through the clamps 23, 24 in varying degrees.

Moreover, the vertical apertures in the clamps 23, 24 provide sufficient clearance to permit the curved side arms 11, 12 to be slid equal distances therein for adjusting the supporting ring 10 in a vertical direction, after which the thumb screws 25 may be tightened so as to hold the retractor securely at the desired elevated position. Lateral tilting adjustment of the supporting ring 10 may, of course, be obtained by moving either one of the side arms 11, 12 vertically in its respective clamp 23 or 24, whereas tilting of the ring 10 in a direction longitudinally of the table 22 may be permitted by the manipulation of the thumb screws 19.

Thus, the supporting ring 10 may be easily adjusted laterally, longitudinally, and vertically, and tilted either laterally or longitudinally so that it will occupy the precise position desired by the surgeon, in which position it will be firmly held by the thumb screws 19 and 25.

After an incision or opening has been made in the patient's body, the retracting elements 26 will be inserted in the wound and applied to the ring 10 in the positions desired, the brackets 29 being slipped over the outer edge of the ring 10 so that

the arms 27 of said retracting elements are disposed above said ring. The slotted formation of the retracting element arms 27 will now permit each element to be slid outwardly so as to provide the desired degree of retraction, after which the respective thumb nuts 32 will be tightened.

The upstanding pins 34 on the brackets 29 will, of course, prevent undesirable rotation of said brackets during manipulation of the thumb nuts 32, and will aid in maintaining the slotted arms 27 and brackets 29 in proper relationship at all times.

Inasmuch as the brackets 29 are slidable around the periphery of the supporting ring 10, the retracting elements 26 may be adjusted laterally in order to afford the desired support to the organs or to the edges of the open wound.

It will be understood that any of the retracting elements 26 may be applied, removed, or adjusted at any time during the course of the operation, and if desired, may be replaced with retracting elements which are longer or shorter, or of a different type, thus filling the needs of the moment.

It will be noted that the invention herein disclosed provides a means whereby each of the retracting elements may be independently adjusted and held in a definite position with relation to the operation table. Further, the retracting elements cannot accidentally change their positions and the force exerted by one retracting element will be independent of the force exerted by any of the other retracting elements. Moreover, the patient will be spared the shocks which might be caused by accidental movement of a retractor in contact with the peritoneum which frequently occurred when the retracting elements were held by an assistant.

One advantage of the invention herein disclosed is that each of the retracting elements may have a substantially universal adjustment with respect to the operating table, while avoiding any changes of position or adjustment excepting as desired by the surgeon.

When the retractor is no longer needed, it may be readily removed from the clamps 23, 24 after first loosening the thumbscrews 25. The side arms 11, 12 may then be swung about the cross-pins 16 and folded under the supporting ring 10 so that the retractor will have a compact form which may be readily inserted into an autoclave for sterilization.

Inasmuch as the retractor may be compactly folded, it will ordinarily be unnecessary to detach the side arms 11, 12 from the supporting ring 10, or to loosen the thumbscrews 19 excepting for purposes of adjustment.

While there has been disclosed in this specification one form in which the invention may be embodied, it is to be understood that this form is shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosure but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new and for which it is desired to secure Letters Patent, is:

1. In a surgical retractor, a continuous, integral, circular supporting ring, a plurality of retracting elements movably mounted upon said ring, a pair of side arms attached by flexible joints to opposite portions of said ring, and a pair

5

of adjustable clamps on said side arms for securing said side arms to a support.

2. The invention as defined in claim 1, in which said side arms are curved outwardly and downwardly from said supporting ring and are vertically slidable in said clamps, whereby said ring may be adjusted by vertical sliding movements of said arms in said clamps.

3. The invention as defined in claim 1, wherein said side arms are flexibly attached to said supporting ring by devices which comprise crosspins secured in transverse positions in the end portions of the respective arms.

4. The invention as defined in claim 1, wherein said side arms are attached to said supporting ring by pivot pins swingably supported upon end portions of the respective side arms, and means releasably securing said pivot pins to said supporting ring in positions extending radially of said ring.

5. In a surgical retractor, a circular supporting ring, means detachably mounting said ring upon the side rails of an operating table, a plurality of angular retracting elements, each having a longitudinally slotted horizontal upper section, and a depending curved section for engaging the internal organs or sides of the incision made in the patient, a bracket having a horizontal slot

6

embracing said ring, said bracket having a vertical threaded stud extending upwardly through the slot in the upper section of said retracting element, and a thumb nut on said stud for clamping said retracting element and said bracket in radial or circumferentially adjusted position upon said ring.

6. The invention as defined in claim 5 in which said bracket has an upstanding locking pin spaced from said stud and located in the slot of said upper section of the retracting element to prevent undesirable rotation of said bracket about a vertical axis.

DAVID P. SMITH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,747,799	Straus	Feb. 18, 1930
1,839,726	Arnold	Jan. 5, 1932

OTHER REFERENCES

Catalog of the Murray-Baumgartner Surgical Instrument Co. of Baltimore, Md., pg. 113. Received Dec. 26, 1934.