

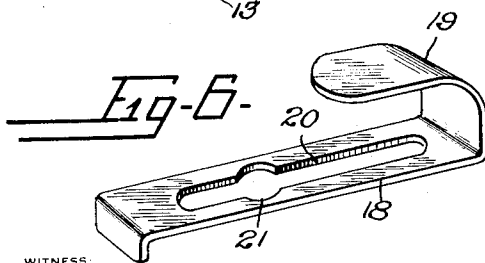
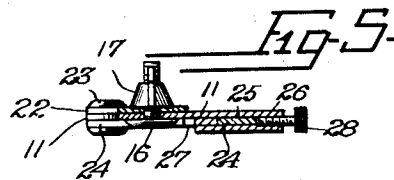
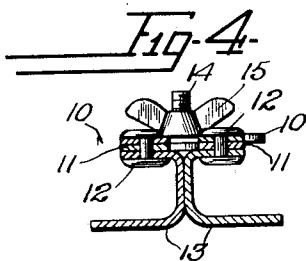
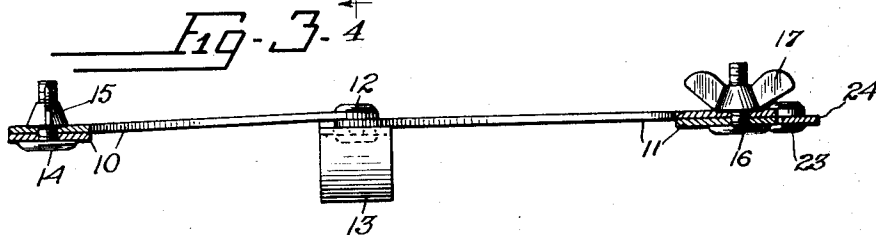
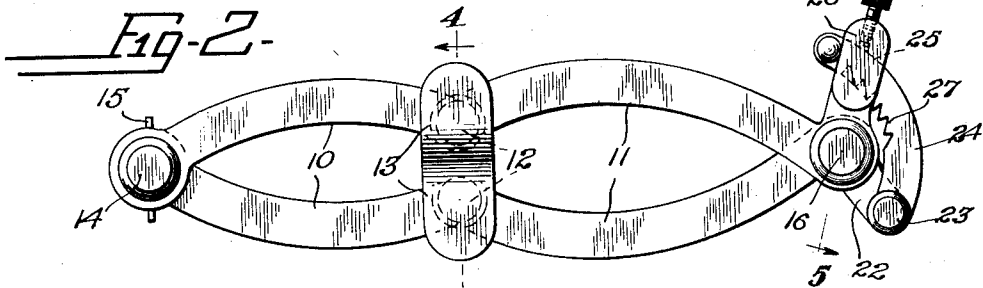
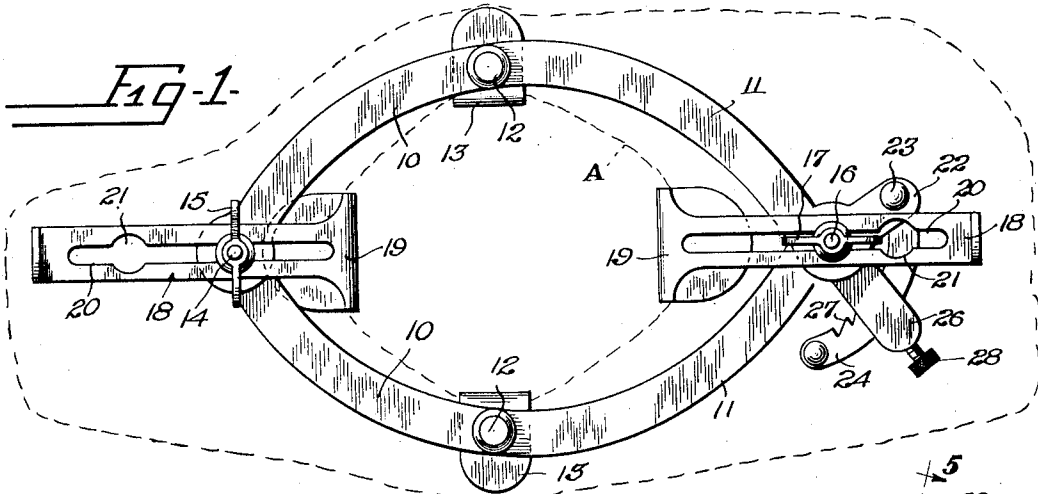
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SURGICAL INSTRUMENT

Filed Feb. 10, 1932



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WITNESS

UNITED STATES PATENT OFFICE

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SURGICAL INSTRUMENT

Application filed February 10, 1932. Serial No. 592,143.

The invention relates to a surgical apparatus and has for its principal or general object the provision of a novel and simple mechanical retractor for abdominal surgery.

5 It is well known that successful execution of surgical procedures depends upon the skill and judgment of the surgeon, and adequate exposure. To maintain exposure of the abdominal viscera, the surgeon is required
10 either to employ hand retractors manipulated by assistants, or mechanical retractors fixed in place and allowed to remain for the duration of the operation. There is no doubt that intelligent assistance with hand retractors is
15 very helpful during the performance of difficult surgical procedures, yet many times the physical presence and hands of the assistant hamper the surgeon and obscure his view. On the other hand, a mechanically simple
20 and efficient instrument for abdominal retraction relieves the assistant of duties and permits him to aid the surgeon in the actual intraabdominal manipulations. He is free
25 to hold important clamps and tissues, thus facilitating the operation.

During the past several years the need has been felt for a more efficient abdominal retractor than those which are in common use. We have employed several instruments which
30 retract the abdominal incision from three places in a triangular manner. When this system is applied to an incision in the elastic abdominal wall it leaves a fourth side which is not restrained. The result is unbalanced
35 forces, and it is this unbalanced system of forces which makes any three-point retraction of the abdominal wall or, for that matter any sphincter, inefficient and unsatisfactory.

40 It is with the above facts in view that we have devised the present invention which has for an important object the provision of a retractor which will operate from four diametrically opposite places and which em-
45 bodies curved arms so that the maximum space may be enclosed within a circular opening, since, geometrically speaking, the circle embraces the maximum area for any given dimensions.

50 Another object of the invention is to pro-

vide a surgical device of this character which is so constructed as to hold in place sterile gauze packs for the purpose of excluding viscera from the field of operation.

A further object is to provide a device of 55 this character which is securely held in adjusted position so that it cannot possibly slip, by means of a novel ratchet device and set screw, the number of adjustments being reduced to the minimum as a multiplicity of 60 such constitutes a source of annoyance.

Still another object is to provide a device of this character in which the relatively movable parts are so arranged as to be easily ad- 65 justable to direct pull and a fair amount of lateral displacement so that proper exposure may be had of an organ or organs upon which an operation is to be performed.

An additional object is to provide an apparatus of this character which will be very 70 simple and inexpensive to make, easy to use and adjust, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and ad- 75 vantages in view, the invention consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing, in which 80

Figure 1 is an elevation of the complete device, an incision being shown as engaged by it for the purpose of making proper exposure.

Figure 2 is an elevation of the device in 85 folded position and with two of the retractors removed.

Figure 3 is a side elevation of what is shown in Figure 2.

Figure 4 is a cross section taken on the line 4-4 of Figure 2. 90

Figure 5 is a detail section taken on the line 5-5 of Figure 2 and

Figure 6 is a detail perspective view of one of the retractor elements or members.

Referring more particularly to the draw- 95 ing we have shown the device as comprising two pairs of curved arms 10 and 11 permanently pivotally connected at their meeting ends as by rivet like devices 12 which pass through and secure horizontally disposed U- 100

shaped hook-like retractors 13. The meeting ends of the arms 10 are pivotally connected as by a bolt 14 carrying a wing nut 15, and the meeting ends of the arms 11 are pivotally and adjustably connected by a similar bolt 16 carrying a wing or thumb nut 17.

In addition to the laterally disposed retractors 12, we provide other similar devices for the same purpose associated with the bolts 14 and 16, both of these devices being similar and each comprising a substantially J-shaped member 18 having a hooked end 19 and formed with a longitudinal slot 20 intersecting a circular opening 21 of a size to permit the wing nuts 15 or 17 as the case may be to pass through so as to facilitate engagement and disengagement of the retractor upon the remainder of the device. Figure 1 discloses a pair of these retractors 18 while Figure 2 discloses them as omitted or removed as they naturally would be when the device is collapsed so as to occupy the minimum space in transportation or storage. Clearly the devices 18 may be adjusted toward or from each other for a purpose to be described in greater detail hereinafter.

As reliance cannot be placed entirely upon the nuts 15 and 17 for maintaining the arms 10 and 11 in adjusted position, we have shown one arm 11 as formed with an extension 22 upon which is pivoted at 23 a curved latch arm 24 slidable through a slot 25 in an extension 26 on the other arm 11, the inner or concaved edge of this latch arm 24 being formed with ratchet teeth 27 adapted to engage the edge of the slot and to be held in engagement therewith as by a set screw 28 threaded through the extremity of the extension 26 as clearly shown in Figure 5.

Obviously, when the arms 10 and 11 are moved upon their pivot bolts 14 and 15 so as to extend away from one another as shown in Figure 1 the retractors 12 and 18 if engaged with the edges of an incision such as that indicated at A will act to hold the edges retracted so as to expose the area within their confines. Such adjusted position is maintained by means of the latch arm 24 and set screw 28 so that there will be no possibility of the device slipping when in place. The foregoing constitutes a description of the construction of the device itself.

In the use of the instrument, for instance in connection with lower abdominal procedures, the patient is prepared for operation in the usual routine manner. A midline incision of appropriate length is then made in the abdominal wall and the peritoneum is incised in the usual manner. The operator then grasps the device, for instance in his right hand and near the middle and engages first one and then the other of the side retractors 12 against the opposite edges of the incision. With both hands grasping the arms 11 the instrument may be quickly

opened, for instance into the position shown in Figure 1, and then securely fastened by means of the ratchet latch 24 and set screw 28 provided for that purpose. The patient is then placed in the proper position, several gauze packs are slipped into the abdomen to exclude the viscera and one or both of the retractors 18 may then be placed in position with the hook-shaped end or the hook-shaped ends 19 thereof engaging whatever pack is provided for the purpose and restraining the pack or packs and also the intestines. Naturally the upper retractor 18 should be placed in position first and the lower one then properly located. By adjusting the retractors 18 longitudinally it is quite apparent that the desired tension or traction may be applied to the edges of the incision so as to obtain the proper and necessary exposure so that the surgeon will have a clear field for whatever manipulations are necessary. The retractors 12 and the hook-shaped ends 19 of the retractors 18 are made of sufficient size to engage not only the edges of the incision but also any packs or other protective devices or means which may be necessary for the purpose.

From the foregoing description and a study of the drawing it will be apparent that we have thus provided a very simply constructed and easily adjusted device for the purpose specified and one which when in position positively cannot slip, thereby leaving the assistant free to aid the principal surgeon in the more important steps in abdominal operations and the like. Naturally there is no particular limitation or restriction as to where the device is to be used and it is of course apparent that there are a wide variety of purposes as it is not limited for employment in connection with any one type of operation. It is thought from the above that the construction, operation and advantages should be readily apparent to one skilled in the art without further explanation.

While we have shown and described the preferred embodiment of the invention we reserve the right to make all such changes in the details of construction and the arrangement and combination of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention we claim.

1. A clamp of the character described comprising two pairs of curved arms, the arms of each pair pivotally connected at one end and pivotally connected at their other ends with the ends of the other pair, hook-like members mounted at said second named pivots, retractors pivotally and slidably mounted at the first named pivots, and means for locking said arms against relative movement.

2. A clamp of the character described com-

prising two pairs of curved arms, the arms of each pair pivotally connected at one end and pivotally connected at their other ends with the ends of the other pair, hook-like members pivotally and non-slidably mounted at said second named pivots, retractors pivotally and slidably mounted at the first named pivots, and means for locking said arms against relative movement comprising an extension on one arm adjacent one first named pivot, a latch arm pivoted on said extension, and a slotted extension on the other arm slidably receiving said latch arm and carrying screw means engaging the same.

3. A clamp of the character described comprising two pairs of curved arms pivotally connected at their remote ends and the arms of one pair being pivotally connected at their other ends with the arms of the other pair, hook-shaped retractors permanently mounted at the second named pivots, hook-shaped

retractors slidably adjustably connected with said first named pivots, and latch means carried by one arm and cooperating with the adjacent end of another for securing all of the arms against movement from adjusted position.

4. An instrument of the character described comprising two pairs of curved arms pivotally connected at one end, each pair being pivotally connected at its ends with the ends of the other pair, hook-shaped retractors mounted permanently at the second named pivots, longitudinally slotted hook-shaped retractors mounted at the first named pivots and slidably toward and from each other, and screw operated ratchet like latch means carried by one arm and cooperating with the adjacent arm for locking all of the arms against movement from an adjusted position.

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