

[54] **UTERINE DISPLACEMENT DEVICE**

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[51] Int. Cl. **A61b 17/42**

[58] Field of Search **128/361, 303, 303 A, 20, 1; 269/328; 248/124, 286; 33/169 R**

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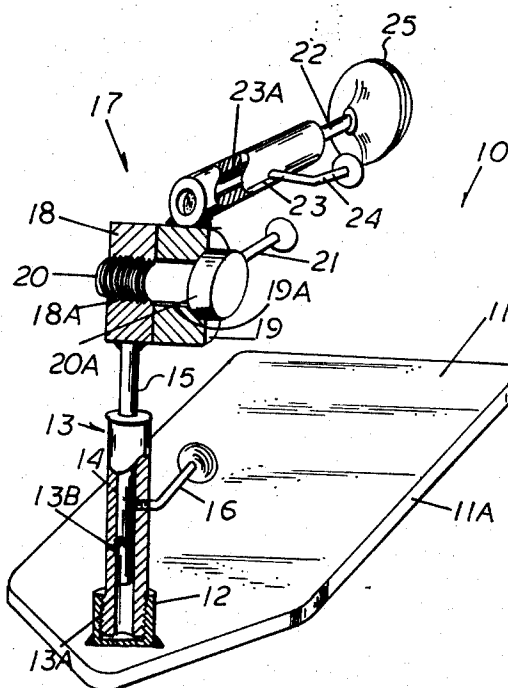
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[57] **ABSTRACT**

This disclosure is directed to a mechanical device to effect left uterine displacement to prevent or treat supine hypotensive syndrome in a patient, e.g., during Cesarean Section operations. The device includes an adjustable stanchion adapted to be suitably supported adjacent a patient to which there is connected an adjustable arm and associated compression means for effecting left displacement of the uterus. The device is constructed for universal adjustment in any of the three axial planes so as to be readily adjusted to any particular patient.

4 Claims, 8 Drawing Figures



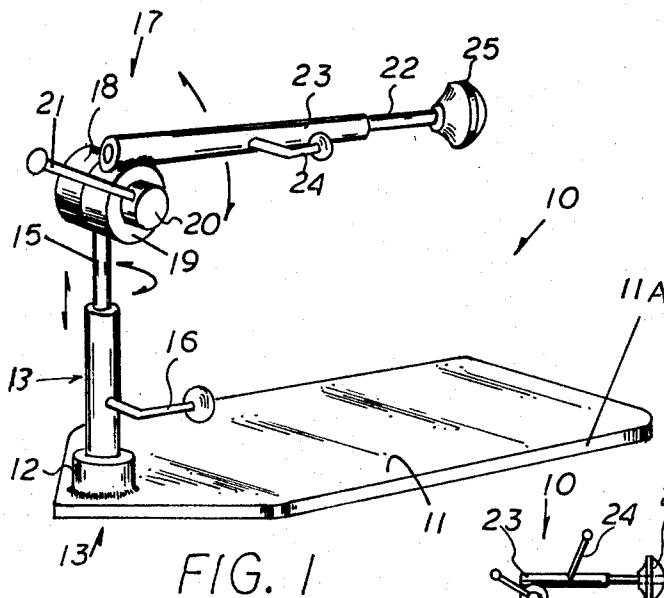


FIG. 1

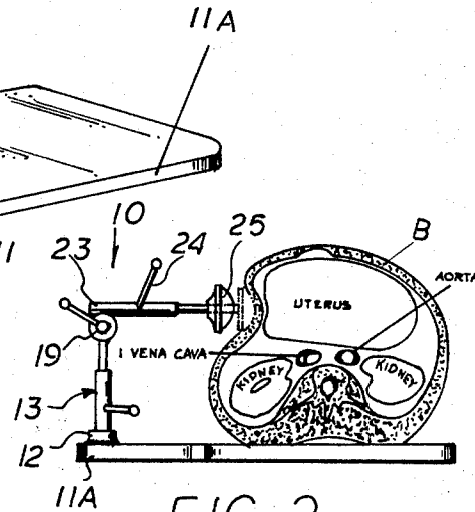


FIG. 2

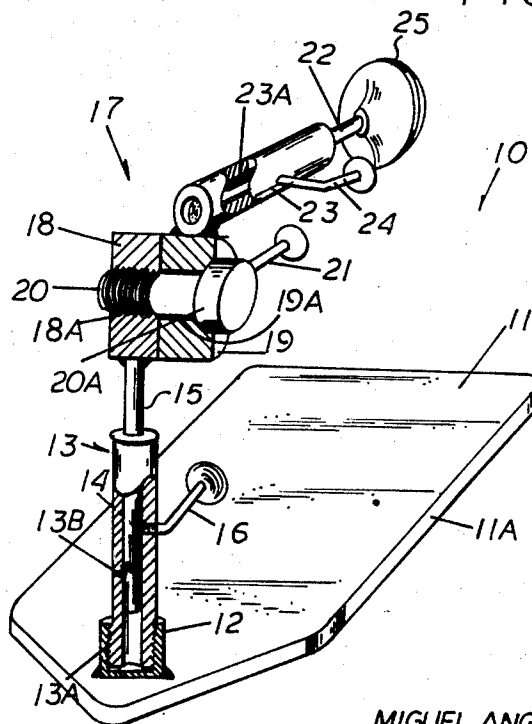


FIG. 3

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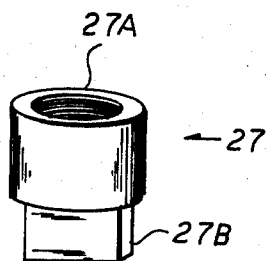


FIG. 4

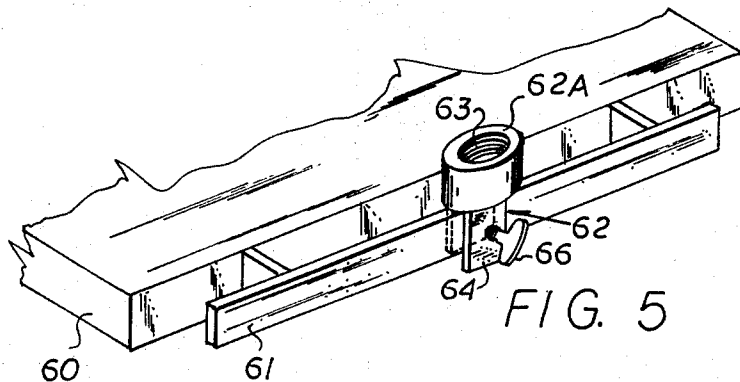


FIG. 5

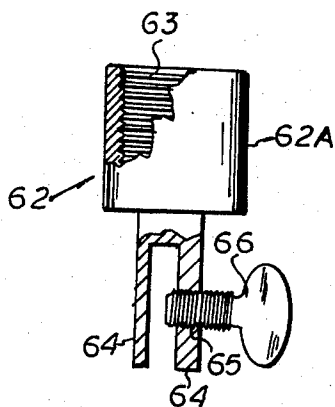


FIG. 6

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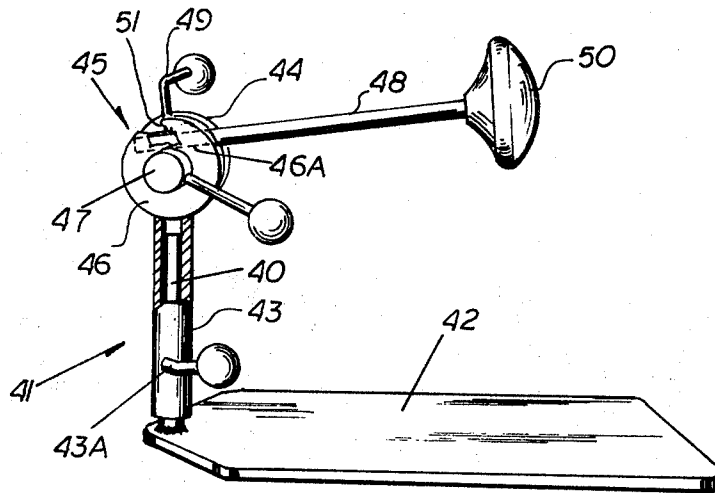


FIG. 7

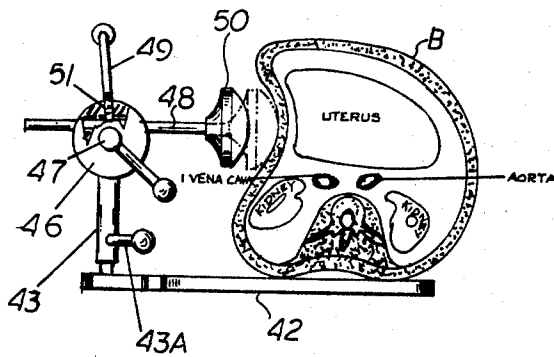


FIG. 8

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UTERINE DISPLACEMENT DEVICE

PROBLEM AND PRIOR ART

It frequently happens during delivery that when a pregnant patient is in a supine position, that the uterus and the weight of the unborn baby tend to compress the inferior vena cava thereby decreasing the uterine blood flow in proportion to the decrease experienced in the maternal blood pressure. The supine hypotensive syndrome is especially present during Cesarean sections as a result of muscle relaxant drugs administered to the patient during the operation. To counteract the supine hypotensive syndrome vasopressors have been administered to increase the patient's blood pressure.

However, the use of such vasopressors, either prophylactically or therapeutically, during Cesarean sections under regional anesthesia may invite certain calculated risks. For example, the synergistic effect of oxytocic and vasopressors constitutes a potential danger with severe consequences to the parturient.

It is known that the use of vasopressors may bring on in certain patients undergoing Cesarean sections an uncontrollable hypertensive crisis that can result in a cerebrovascular accident.

It has been observed that the supine hypotensive syndrome noted in patients during Cesarean sections could be relieved by effecting a displacement of the uterus, thus relieving the pressure on the inferior vena cava. This was heretofore effected by turning the patient over on her left side, or tilting the operating table approximately 30° to the left, or by placing a sand bag under the patient's right hip. These physical methods of displacing the uterus provide impractical because invariably they interfered with the operative procedures.

Another method which was employed was for the surgeon, his assistant or the anesthesiologist to effect manual displacement of the uterus. However this method required the use of one's hand and attention which detracted the holder from his more important functions of attending to the operating procedures.

OBJECTS

It is an object of this invention to provide for a mechanical device to effect a left uterine displacement during Cesarean Sections to prevent or treat supine hypotensive syndrome in a patient.

Another object is to provide a mechanical uterine displacement device which when set does not require the attention of any operating room personnel.

Another object is to provide a mechanical uterine displacement device which can be readily adjusted to any particular patient.

BRIEF SUMMARY OF THE INVENTION

The foregoing objects and other features and advantages of this invention are attained by a left uterine displacement device which comprises a telescoping stanchion in which telescoping members may rotate and/or extend with respect to one another. The telescoping stanchion is formed to fit a fixture or fitting normally found along the edge of an operating table, or to be detachably connected to a supporting plate which may be placed beneath the body of a supine patient. Connected to the upper end of the stanchion is an adjustable head. The adjustable head includes a first head portion which is fixedly secured to the stanchion and a second head portion mounted for relative rotation with respect to the first head portion. A locking means is operatively associated with the respective head portions to fixedly secure them in an adjusted position.

Connected to the relatively movable head portion is an extendable arm which has connected to the end thereof a compression pad adapted to engage the body of the patient to effect uterine displacement, and means are provided for locking the arm in the adjusted position thereof. The arrangement of the left uterine displacement device is such that the arm and

the associated compression pad may be readily adjusted in any of the three spatial planes.

Features

A feature of this invention resides in the provision of a mechanical uterine displacement device which is relatively simple in structure, which can be easily manufactured, and which is positive in operation.

Another feature of this invention resides in the provision of a left uterine displacement device in which the compressing pad may be readily adjustable in each of the three spatial planes so that the device is rendered universally adaptable for any patient.

Another feature of this invention resides in the provision of a uterine displacement device which can be optionally connected to a fitting or attachment normally found along the edge of an operating table or to a support which may be disposed below the body of a supine patient.

Another feature of this invention resides in the provision of a uterine displacement device having its own supporting base means adapted to be placed beneath the body of a supine patient.

Other features and advantages will become more readily apparent when considered in view of the drawings and specification in which:

FIG. 1 illustrates a perspective view of a left uterine device embodying the invention.

FIG. 2 illustrates a left uterine displacement device as applied to the body of a patient.

FIG. 3 is an elevation view of the uterine displacement device having portions thereof shown in section.

FIG. 4 is a detailed view of an adaptor by which the uterine displacement device may be secured to the attachment fixture of an operating table.

FIG. 5 is a perspective view illustrating a modified adaptor.

FIG. 6 is a detail view of the adaptor of FIG. 5.

FIG. 7 is a perspective view of a modified form of the invention.

FIG. 8 illustrates the embodiment of FIG. 7 applied to a body of a patient.

DETAILED DESCRIPTION

Referring to the drawings there is shown in FIG. 1, a left uterine displacement device 10 embodying the present invention. The uterine displacement device 10 may be formed to be optionally connected to a fitting (not shown) generally found on an operating table or to a support means 11 in the form of a flat plate 11A which is adapted to be positioned under the body B of a supine patient. It will be understood that the plate 11A may be formed of any desired material, e.g., metal, plastic or wood. In the illustrated form of the invention the support plate 11A is provided with a connector 12 adjacent an edge portion by which the stanchion means 13 of the uterine displacement device may be detachably connected thereto. As shown the connector 12 is illustrated as comprising of an internally threaded boss fixedly secured to the plate 11A. However, the connector 12 may comprise any desired type of connector for detachably receiving the stanchion means 13.

The stanchion means 13 comprises telescoping members including an outer member 14, formed of a suitable tubular construction, having an externally threaded lower end portion 13A by which it may be detachably threaded to the connector 12 of the support plate. Slidably disposed within the bore 13B of the outer telescopic member 14 is an inner or slidable member 15 which is adapted to move between an extended and retracted position relative to the outer telescoping member 14. The slidable member 15 receivable within the bore 13B of the outer member 14 is also free to rotate within the bore 13B relative to the outer member 14. A set screw or lock screw 16 is provided by which the inner member may be locked in adjusted position.

Connected to the extended end of the slidable member 15 is an adjusting head means 17. The adjusting head means 17

comprises a first head portion 18 which is fixedly secured to the end of the slidable member 15. A tapped hole 18A extends laterally into the first head portion 18. A second head portion 19 is rotatably journaled relative to the first head portion about a pin or screw 20 which is threaded into the tapped hole 18A of head portion 18. The pin or screw 20 includes a shank portion that extends through an opening 19A in head portion 19, the opening 19A having a diameter slightly greater than the diameter of the shank so that the head portion 19 may rotate about the shank of pin 20, as will be hereinafter described. The pin or screw 20 is provided with a shoulder 20A which is adapted to bear against head portion 19 when the screw 20 is threaded tightly into the tapped hole 18A. Thus the arrangement is such that the screw 20 functions as a locking means for securing the head portions 18 and 19 in an angularly adjusted position when the screw 20 is threaded tightly into tapped hole 18A. To facilitate the threading of the screw 20 into and out of the tapped hole 18A an operating handle 21 is suitably connected to the head end portion of the locking screw 20.

Connected to the movable head portion 19 of the adjusting head means 17 is an arm 22 which is arranged to laterally extend and retract relative to the adjusting head 17. In the illustrated form of the invention the lateral adjustment of the arm 22 is effected by slidably supporting the arm 22 in a sleeve mounting 23 secured to the movable head portion 19. The sleeve is provided with a longitudinally extending bore 23A in which the arm 22 is free to slide. A set screw 24 threaded through the sleeve 23 is provided to fix the arm 22 in the adjusted position thereof.

To the free end of the arm 22 there is connected compressive pad 25 formed of a suitable resilient material, e.g., rubber, foraminous plastic, or the like. In the illustrated form of the invention the compressing pad 25 is semi-spherical or bulbous in form. The compressive pad 25 carried on the end of the extensible arm 22 is such that it can be adjusted to exert the desired compressive force on the body of the patient which is effectively distributed over a sufficiently large surface area of the abdomen to effect the necessary displacement of the uterus during Cesarean sections so as to relieve the pressure it would otherwise exert on the inferior vena cava blood vessel. With the left uterine displacement device described, properly positioned against the abdomen of a patient, the uterus can be maintained in a properly displaced position throughout a Cesarean Section in a manner to either avoid or greatly minimize any supine hypotensive syndrome during Cesarean sections, without further attention by the operating room personnel.

If desired, the stanchion means 13 of the uterine displacement device 10 may be made attachable to the fixtures which are normally provided along the edge portion of an operating table. This can be readily effected by the utilization of an adaptor 27 which may be detachably connected to the lower or threaded end portion 13A of the telescoping stanchion 13. As best seen in FIG. 4 the adaptor 27 may comprise a threaded holder 27A which is adapted to detachably receive the lower end 13A of the stanchion 13, and which holder is provided with a depending tongue 27B which is adapted to be received in the conventional attachment fixture (not shown) normally found on an operating table. Thus the stanchion 13 and associated adjusting head 17 with the expensible arm 22 of the left uterine displacement device 10 described can be readily adapted to secure either directly to an operating table with the use of the adaptor holder 27 or may be detachably secured to a support plate 11A which may be adapted to be positioned beneath the body of a supine patient.

The left uterine device 10 described thus provides a mechanical means whereby the supine hypotensive syndrome of a patient during Cesarean section may be avoided, thus obviating the need of utilizing vasopressor drugs during Cesarean sections and avoiding the dangers or risks heretofore incidental to the use of vasopressors. Also the left uterine displacement device described enables the attending physician and/or anesthesiologist to assume their normal position during

Cesarean sections permitting them to maintain the free use of both of their hands to perform the necessary operating functions.

FIGS. 5 and 6 illustrate a modified adaptor. As seen in FIG. 5 an operating table 60 is provided with a side rail 61 spaced along the opposed longitudinal edges of table 60. In accordance with this invention an adaptor, as illustrated in FIGS. 5 and 6 is provided whereby the uterine displacement device may be detachably secured to the operating table. As seen in FIGS. 5 and 6 the adaptor 62 comprises a holder portion 62A which is provided with internal threads 63 to detachably receive the lower threaded end portion 13A of stanchion 13.

Depending below the bottom of holder 62A are bifurcated or spaced apart tongue portions 64—64 which are adapted to straddle the side bar 61 as seen in FIG. 5. One of the tongue portions 64 is provided with a tapped hole 65 for receiving a set screw 66 by which the adaptor may be fixedly secured in position along the side rail 61. Thus by loosening the set screw 66, the adaptor may be either removed from the side rail 61 or adjusted longitudinally therealong. The adaptor 62 thus enables the uterine displacement device to be readily adapted for use in conjunction with an operating table in a manner whereby it can be readily adjusted longitudinally along the table 60.

While a screw thread detachable coupling is illustrated between the adaptor 27 and 62 and the stanchion means 13 of the uterine device, it will be understood that any readily detachable coupling means may be utilized in lieu of the threaded coupling described.

FIGS. 7 and 8 illustrate a modified uterine displacement device. This embodiment is similar to that described with respect to FIGS. 1 to 3 with the exception that the inner member 40 of the stanchion means 41 is connected to the base or support 42 with the outer stanchion member 43 free to move relative to member 40. Set screw 43A adjustably secures the respective stanchion members 40, 43 in adjusted position. The outer stanchion member 43 is fixedly secured to head portion 44 of the adjusting head 45; and head portion 46 is rotatably adjusted about pin 47 in a manner similar to that of FIGS. 1 and 2.

Adjustable head portion 46 is provided with a bore 46A for slidably receiving arm 48. The arrangement is such that the arm 48 is free to laterally extend and distend relative to head portion 46. A set screw 49 threaded in a tapped hole 51 intersecting with bore 46A secures the arm in the adjusted position.

In this embodiment the adjustable arm is thus carried in a bore 46A extending through a chordal portion of the rotatable head portion 46. Connected to the free end of arm 48 is a compression pad 50 by which a compressive force is exerted against a body B of a patient as shown in FIG. 8.

In operation, the embodiment of FIGS. 7 and 8 is similar to that described with respect to FIGS. 1 to 4. It will be of course understood that stanchion means 41 of FIG. 7 can be connected to base or support 42 so as to be readily detachable to permit it to be detachably connected to the fixture or attachments generally found on an operating table.

While the instant invention has been described with respect to particular embodiments thereof it will be readily appreciated and understood that variations and modifications may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. A uterine displacement device comprising:

a base support in the form of a flat plate adapted to extend under the body of a supine patient,
a stanchion means extending upwardly from said flat plate adjacent one end thereof,
said stanchion means including at least a pair of nested telescoping members,
one of said telescoping stanchion members being connected to said plate and the other being movably mounted with respect thereto to vary the vertical extended length of said stanchion means,

means for securing said telescoping stanchion members in the adjusted position,
 and an adjusting head means connected to the end of said movable member of said stanchion means,
 said adjusting head means including a fixed head portion 5
 connected to said movable member, said fixed head having a tapped hole therein,
 and a movable head portion rotatably adjusted relative to said fixed head portion, said movable head having a bore 10
 extending therethrough, each of said head portions having smooth complementary bearing surfaces,
 means for securing said head portions in adjusted position,
 and said means for securing said adjusting head portions includes a lock pin having a threaded shank adapted to be 15
 threaded into said tapped hole and a stop shoulder disposed intermediate the length of said pin,
 said bore being slightly larger than the diameter of said threaded shank and smaller than the diameter of said shoulder whereby said head portions are maintained in 20
 adjusted position by said lock pin in the fully threaded position thereof,
 an arm connected to said movable head portion,
 said arm extending laterally outwardly of said adjusting head means,
 means for adjusting said arm laterally of said adjusting head 25
 means,
 means for securing said arm in the laterally adjusted position,
 and a compression means connected to the free end of said arm. 30

2. A uterine displacement device as defined in claim 1 wherein said arm adjusting means includes:
 a sleeve connected to said movable head portion,
 said sleeve having a bore therein for adjustably receiving 35
 said arm for lateral extension or retraction,
 and said means of adjustably securing said arm including a manual set screw having an angularly disposed handle portion.

3. A uterine displacement device comprising:
 a support means, 40
 a stanchion means extending upwardly from said support means,
 said stanchion means including at least a pair of nested telescoping members,
 one of said telescoping stanchion members being connected 45
 to said support means, and the other being movably mounted with respect thereto to vary the adjusted vertical length of said stanchion means,
 means for readily securing said telescoping stanchion mem-

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bers in the adjusted position,
 an adjusting head means connected to the end of said movable stanchion member,
 said adjusting head means including a fixed head portion 5
 connected to said movable stanchion member,
 said fixed head portion having a tapped hole therein,
 a movable head portion rotatably adjusted relative to said fixed head portion,
 said movable head portion having a bore extending 10
 therethrough, said bore being disposed in axial alignment with said tapped hole of said fixed head portion,
 each of said head portions having smooth complementary bearing surfaces,
 means for securing said head portions in adjusted angular relationship with respect to one another,
 said means for securing said adjusting head portions including a lock pin having a threaded shank adapted to be 15
 threaded into said tapped hole and a stop shoulder disposed intermediate the length of said lock pin,
 said bore of said movable head portion being slightly larger than the diameter of said threaded shank and smaller than the diameter of said shoulder whereby said head portions 20
 are maintained in relative adjusted angular relationship by said lock pin in the fully threaded position thereof,
 an arm connected to said movable head portion,
 said arm extending laterally outwardly of said adjusting head means,
 means for adjusting said arm laterally of said adjusting head 25
 means,
 means for securing said arm in the laterally adjusted position,
 and a compression means connected to the free end of said arm.

4. A uterine displacement device as defined in claim 3 wherein said support means comprises:
 an adaptor adapted to connect to a slide rail on an operating 30
 table,
 and means for detachably connecting said stanchion means to said adaptor,
 and said adaptor including a depending bifurcated end portion adapted to straddle said slide rail whereby said 35
 uterine displacement device can be slidably positioned along said slide rail,
 one of said bifurcates having a tapped hole extending therethrough,
 and a locking screw threaded to said tapped hole of said bifurcate for securing said adaptor to said slide rail in the 40
 adjusted position thereof.

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