

- [54] **APPARATUS FOR VETERINARY EXAMINATION OR SURGERY OF LARGE ANIMALS**
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- [52] U.S. Cl. .... **269/322**, 16/114 R, 108/90, 119/103, 269/328, 280/47.17, 312/281
- [51] Int. Cl. .... **A61d 3/00**, A61g 13/00
- [58] Field of Search..... 269/322, 328, 323; 119/103; 128/133; 108/90; 312/280, 281; 280/47.17; 16/114 R

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**ABSTRACT**

A method and apparatus for examining or performing surgery on large animals in which the large animal such as a horse is anesthetized in a completely padded recovery area adjacent the operating area. The horse is allowed to fall while being supported closely against a padded wall by attendants. The horse is then arranged in lateral recumbency and a low set surgery top is rolled into the recovery area on its own rollers.

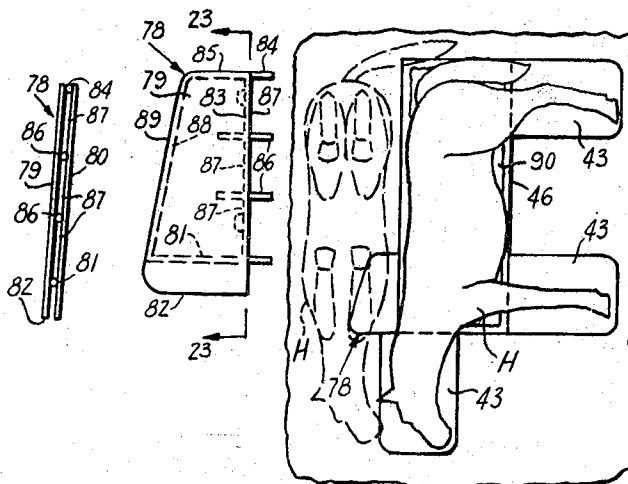
The horse is rolled into dorsal recumbency by two of the attendants and the surgery top is brought closely adjacent the side of the horse and the horse is rolled onto the table into a lateral recumbency position. Detachable elements are connected to the surgical top for supporting the horse's head, shoulder, neck and legs following which the surgery top is rolled into the operating area and over a supporting platform mounted on the upper end of a hydraulic cylinder base. The surgery top is then locked to the supporting platform and the horse is further anesthetized by passing an endotracheal tube through which to supply Halothane.

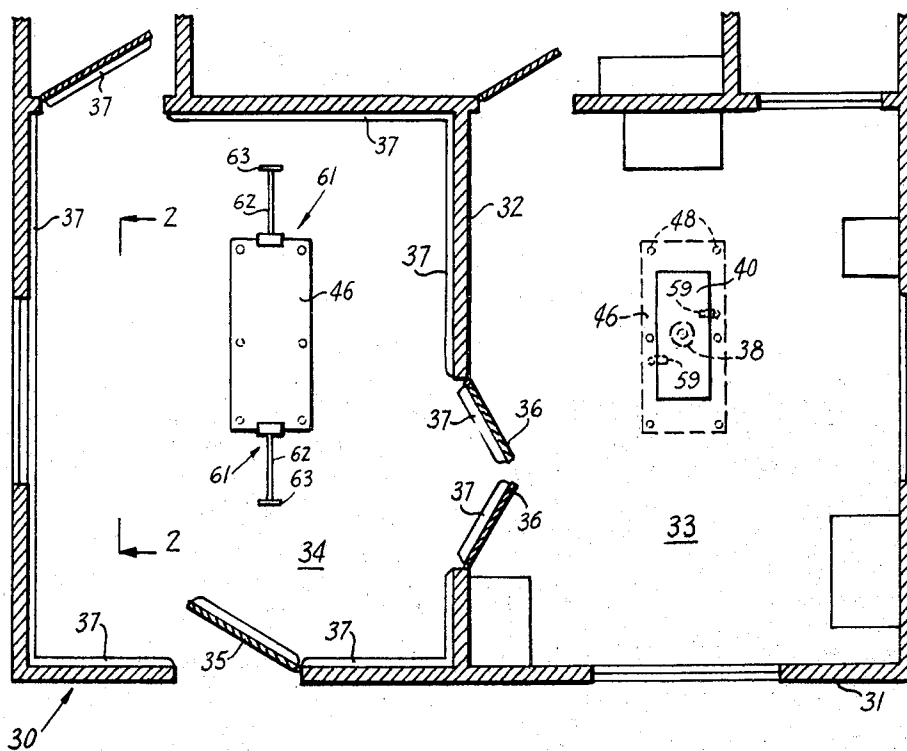
The horse is then left in its lateral recumbency or rolled into a dorsal recumbency and supported for the examination and/or operation. The table is then raised to the desired elevation and the required surgery is performed. Following surgery the support platform is lowered and the surgical top is disconnected to be rolled back into the recovery area with the horse thereon. The horse is then rolled from the surgical top onto the padded floor of the recovery area and the surgical top is removed to the operating area.

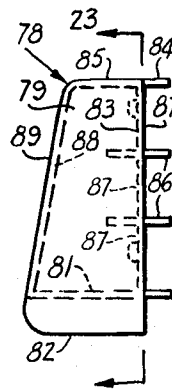
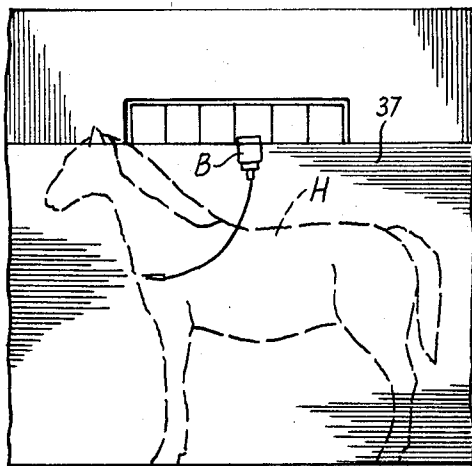
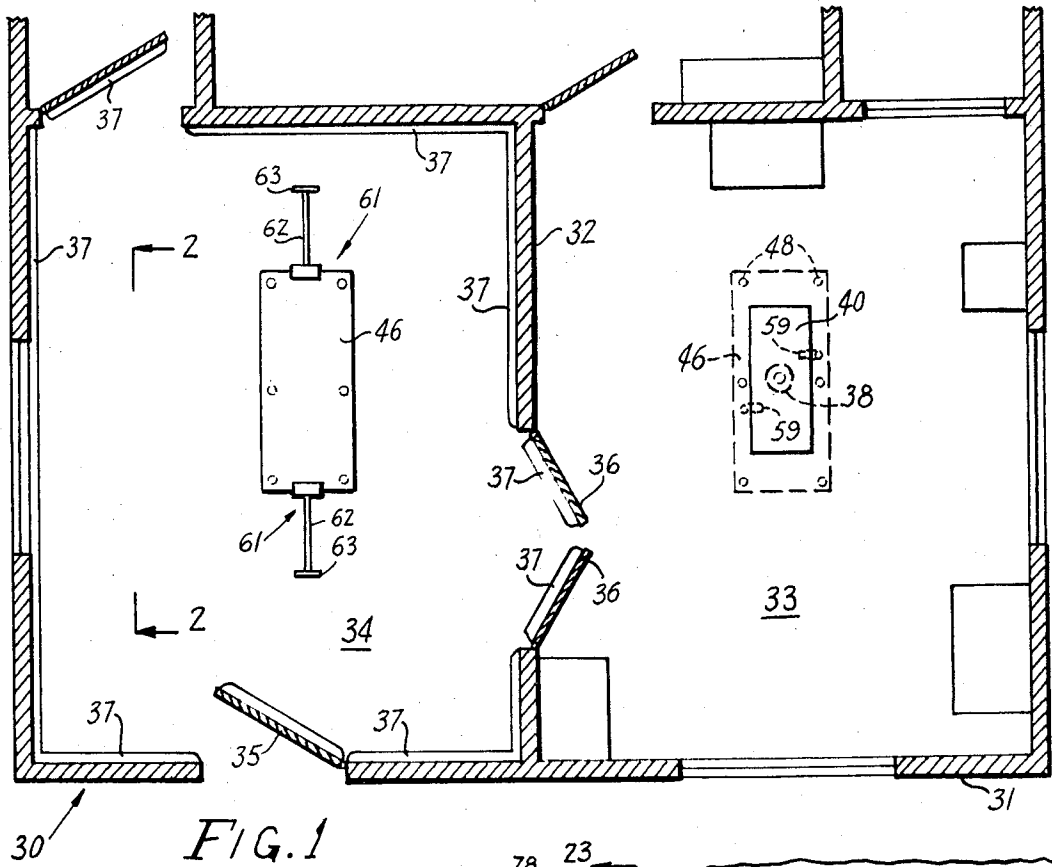
The apparatus includes the support platform, the surgical top and releasable locks for securing the top to the support platform. Removable handles are provided for each end of the mobile surgical top to permit two or more men to manipulate the table with the horse thereon. The surgical top is provided with a plurality of apertures along its edges and in its top surface to receive and support support panels and support chocks to adequately support the horse in any desired position for surgery. At least one pair of adjustable depending legs are provided on the surgical top to permit the top to be supported with two of its rollers out of contact with the floor when it is desired to prevent movement of the surgical top across the floor.

The support platform without the surgical top may, if desired, serve as a table for surgery or examination for smaller and/or younger animals.

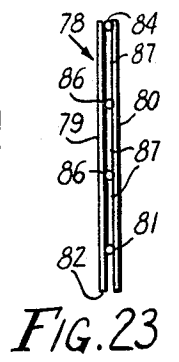
**4 Claims, 24 Drawing Figures**



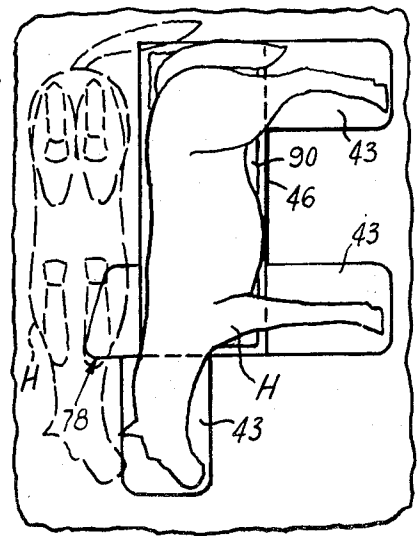




**FIG. 22**



**FIG. 23**



**FIG. 3**

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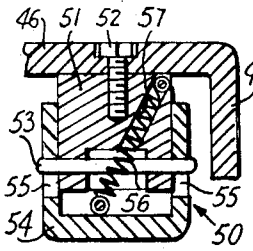
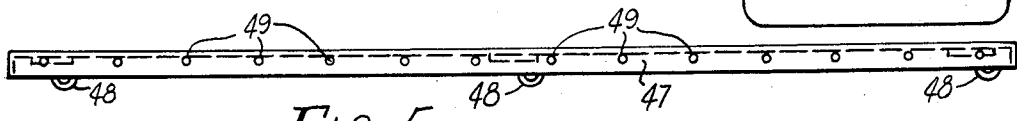
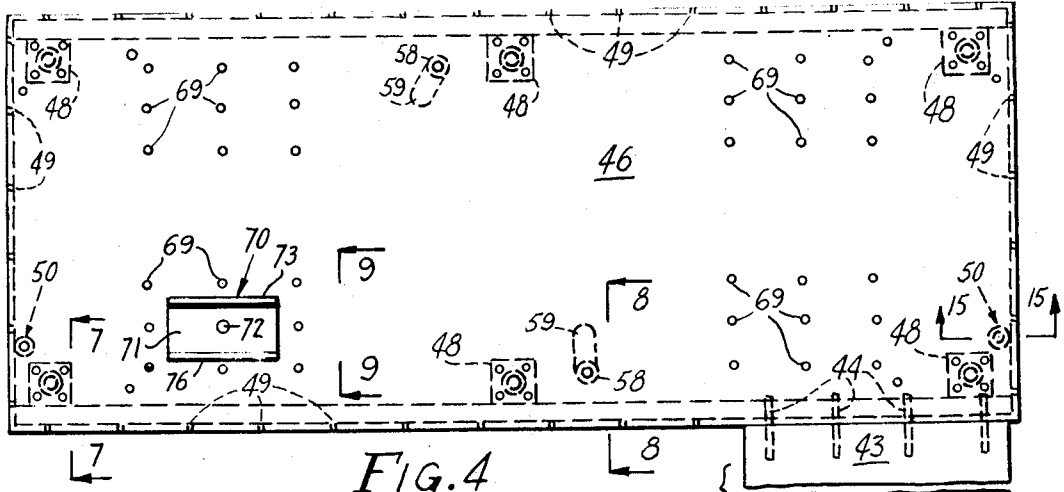


FIG. 15

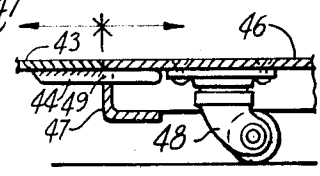


FIG. 7

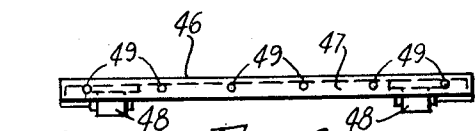


FIG. 6



FIG. 14

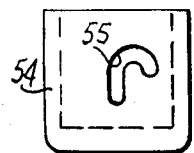


FIG. 16

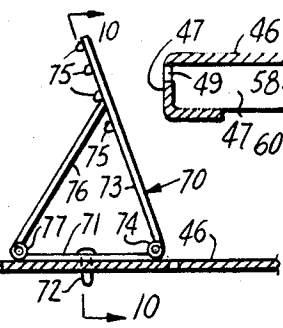


FIG. 9

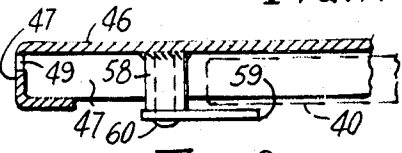


FIG. 8

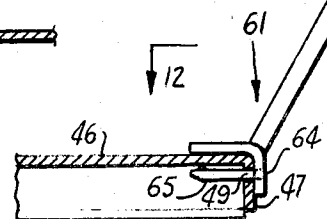


FIG. 11

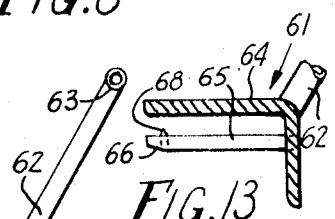


FIG. 13

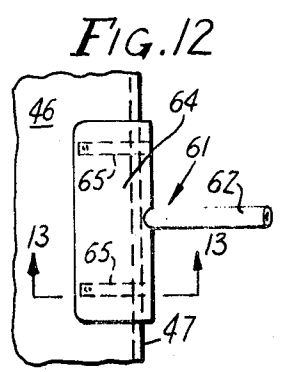


FIG. 12

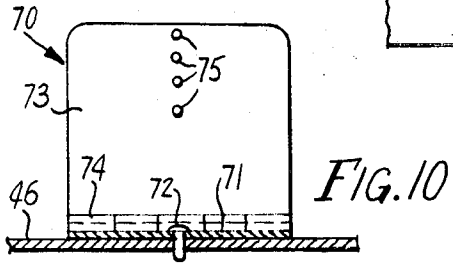


FIG. 10

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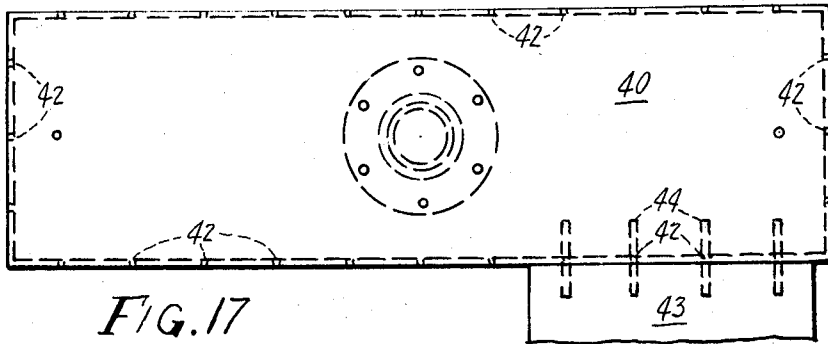


FIG. 17

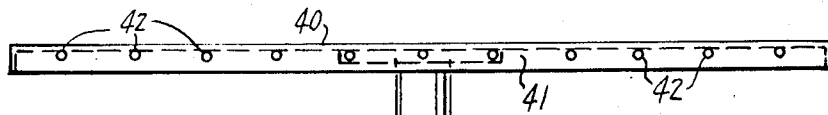


FIG. 18

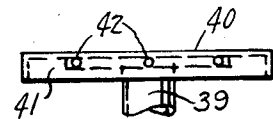


FIG. 19

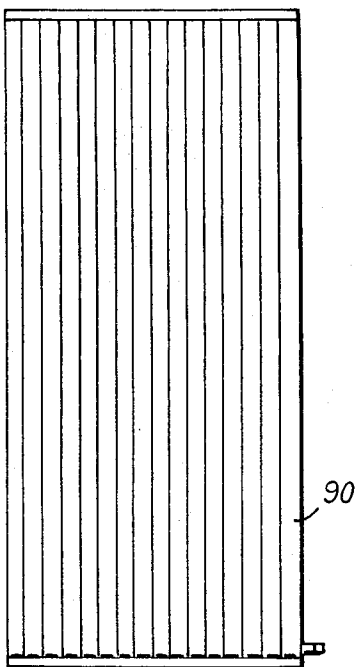
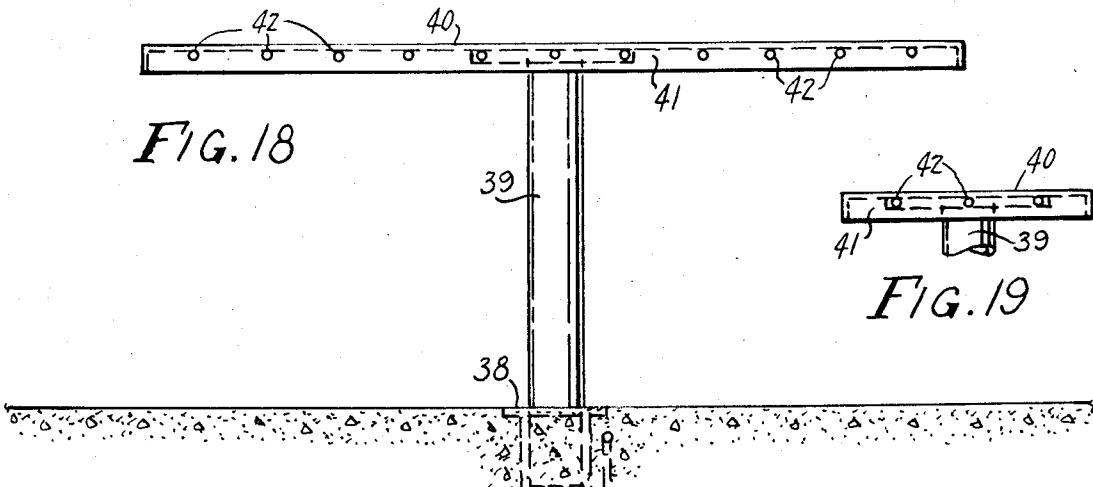


FIG. 24

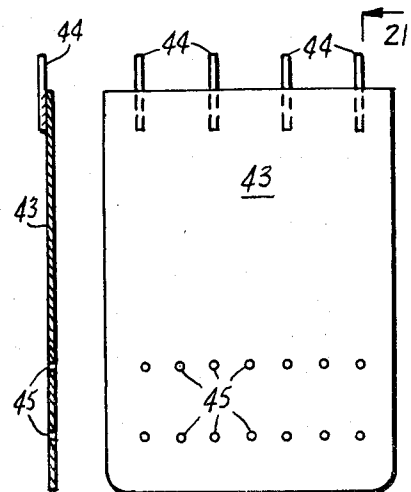


FIG. 21

FIG. 20

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# APPARATUS FOR VETERINARY EXAMINATION OR SURGERY OF LARGE ANIMALS

## BACKGROUND OF THE INVENTION

### FIELD OF THE INVENTION

The present invention relates to apparatus for handling large animals during the steps connected with a surgical operation.

### SUMMARY OF THE INVENTION

The method of the present invention is directed to the anesthetizing of a large animal in a completely padded recovery room, following which the horse is rolled onto a surgery top which is mobile. The horse on the surgery top is then rolled into the operating room and the surgery top is clamped to the hydraulically lifted support platform. The horse is rolled into any desired position for operation and chocks are used to maintain the horse in the desired position. Following surgery the horse is moved into the recovery room on the surgical top and is rolled therefrom onto the padded floor to await recovery. Included in the apparatus is a surgical top having a releasable lock for locking the top to the platform support. The surgical top has depending legs along one side to support the platform with at least two of its casters out of contact with the surface. The surgical top has a plurality of bores formed therein to receive support rods forming part of the panel attachments used with the surgical top. Chocks and other similar devices are mounted in the holes in the top of the surfical top where needed to support the horse for surgery.

The primary object of the invention is to provide an apparatus for handling a large animal during the steps associated with surgery without injury to the animal or to the attendants working with the animal.

Other objects and advantages will become apparent in the following specification when considered in the light of the attached drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of the invention with the building shown in horizontal section;

FIG. 2 is an elevational view of an interior wall of the building taken from the line 2—2 of FIG. 1 looking in the direction of the arrows;

FIG. 3 is a fragmentary top plan view illustrating the procedure of loading the horse on the surgery top;

FIG. 4 is a top plan view of the surgery top;

FIG. 5 is a side elevation of the surgery top;

FIG. 6 is an end elevation of the surgery top;

FIG. 7 is an enlarged fragmentary vertical section taken along the line 7—7 of FIG. 4 looking in the direction of the arrows;

FIG. 8 is an enlarged fragmentary transverse section taken along the line 8—8 of FIG. 4 looking in the direction of the arrows;

FIG. 9 is a fragmentary vertical sectional view taken along the line 9—9 of FIG. 4 looking in the direction of the arrows;

FIG. 10 is a fragmentary longitudinal sectional view taken along the line 10—10 of FIG. 9 looking in the direction of the arrows;

FIG. 11 is a side elevation of the manipulating handle illustrating its attachment to the surgery top;

FIG. 12 is a sectional view taken substantially along the line 12—12 of FIG. 11 as viewed in the direction indicated by the arrows;

FIG. 13 is an enlarged fragmentary transverse cross-section taken along the line 13—13 of FIG. 12 looking in the direction of the arrows;

FIG. 14 is an enlarged transverse cross-section of one of the attaching rods;

FIG. 15 is an enlarged vertical cross-section taken 10 along the line 15—15 of FIG. 4 looking in the direction of the arrows;

FIG. 16 is a side elevation of one of the feet depending from the surgery top;

FIG. 17 is a top plan view of the supporting platform;

FIG. 18 is a side elevation of the supporting platform;

FIG. 19 is an end elevation of the supporting platform shown partially broken away for convenience of illustration;

FIG. 20 is a top plan view of a support panel;

FIG. 21 is a vertical cross-section taken along the line 21—21 of FIG. 20 looking in the direction of the arrows;

FIG. 22 is a top plan view of an invertable panel;

FIG. 23 is a side elevation of the structure illustrated 25 in FIG. 22; and

FIG. 24 is a top plan view of an air mattress used with the surgical top.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures the reference numeral 30 indicates generally an apparatus for handling large animals during steps connected with surgery constructed in accordance with the invention.

The apparatus 30 includes a building 31 divided by a partition 32 into an operating room 33 and a recovery room 34. The recovery room 34 has an outside door 35 in one of its side walls and double doors 36 in the partition 32 connecting the operating room 33 with the recovery room 34. The interior vertical surfaces up to about 5 feet and the floor of the recovery room 34 have padding 37 secured thereto to prevent injury to the large animal such as the horse H as seen in FIGS. 2 and 3.

The operating room 33 has a hydraulic lift 38 embedded in the floor including a piston 39 which is adapted to be raised and lowered by the lift 38. A supporting platform 40 capable of serving as a small animal table is secured to the upper end of the piston 39 for movement therewith. The supporting platform 40 is generally rectangular and has a generally rectangular depending flange 41 integrally formed thereon. The flange 41 has a plurality of evenly spaced bores 42 opening therethrough. A generally flat panel 43 has a plurality of evenly spaced parallel pins 44 secured to the underside of one end thereof so as to project outwardly therefrom. The pins 44 are spaced so as to be received in the bores 42 to permit the panel 43 to be secured to the support platform 40 with its upper surface aligned with the upper surface of the support platform 40. A plurality of bores 45 are formed in the panel 43 to receive attachments described below.

A generally rectangular surgical table 46 is provided with an integral depending flange 47 extending completely around the table 46. Caster wheels 48 are se-

cured to each corner of the table 46 and intermediate both sides thereof. The flanges 47 are provided with a plurality of evenly spaced bores 49 having the same diameter and spacing as the bores 42 in the support platform 40. The panel 43 is adapted to be connected to the table 46 by inserting the pins 44 in the bores 49.

A leg generally indicated at 50 is secured to the table 46 adjacent the corners on one side thereof. The leg 50 includes a generally cylindrical base member 51 secured to the underside of the table 46 by a countersunk cap screw 52. A transverse pin 53 extends through the base member 51 and projects outwardly therefrom at each end thereof. A foot 54 of generally cylindrical form is provided with an inverted J-shaped slot 55 in each side thereof to engage over the free ends of the pin 53. A tension coil spring 56 is secured to the foot 54 at one end and extends up through a bore 57 in the base member 51 and is secured thereto at its upper end. The spring 56 normally maintains the foot 54 in retracted position on the pin 53. When it is desired to use the foot 54 it is moved downwardly by hand and rotated so that the pin 53 engages in the short portion of the J-shaped slot 55 where it remains until release by hand. The foot 54 extends below the table 46 a distance slightly greater than that of the caster 48 so that with the foot 54 in lowered position the table 46 is prevented from moving out on its casters 48.

A pair of bosses 58 are secured to the underside of the table 46 and depend therefrom. A latch bar 59 is secured to the underside of the bar 58 by a pivot pin 60 to permit the latch bar 59 to be hand rotated to a position underlying the support platform 40 on opposite sides thereof to thus lock the table 46 to the platform 40. A pair of handles indicated generally at 61 are provided for opposite ends of the table 46. The handles 61 include an elongate tubular bar 62 having a T handle 63 rigidly secured to its upper end. An angle iron member 64 is secured to the lower end of the bar 62 to engage the upper outer corner of the table 46. A pair of pins 65 are secured to the angle iron member 64 in spaced apart parallel relation and spaced beneath one flange of the angle iron member 64 as can be seen in FIGS. 11 and 13. The pins 65 are upwardly tapered on their outer ends at 66 and have a threaded bore 67 extending vertically therethrough. A pointed threaded setscrew 68 extends through the threaded bore 67 and projects above the surface of the pin 65 to assist in gripping the underside of the table 46 when horizontal outward pressure is put on the upper end of the handle 61. The sloped off outer end 66 of the pin 65 permits the pin 65 to be withdrawn from the bores 49 in the flange 47 when disconnecting the handle 61 and reconnecting it at another point.

The table 46 is provided with a plurality of evenly spaced bores 69 opening downwardly therethrough to receive various attachments such as a chock indicated generally at 70. The chock 70 includes a base plate 71 having a depending pivot pin 72 secured thereto and adapted to engage through a bore 69. The chock 70 has a generally rectangular support plate 73 secured to the base plate 71 by a hinge 74. A plurality of detent bosses 75 are formed on the back surface of the chock plate 73 to engage the upper end of a brace 76 connected to the base plate 71 by a hinge 77. The chock 70 is adapted to be positioned at any desired point on the table top 46 to support the horse H when in dorsal recumbency and as many chocks 70 are used as is re-

quired for the particular animal then supported on the table 46. It should be noted that the chock 70 may also be supported in the bores 45 of the panel 43 when this is desired.

An invertable support generally indicated at 78 includes a pair of spaced apart parallel panel members 79-80. A pin 81 is positioned between the panel members 79-80 and is secured thereto at a point parallel to and spaced inwardly from and end edge 82 of the support 78. The pin 81 projects beyond the panels 79-80 along the inner edge 83 thereof. A pin 84 is secured between the panels 79-80 at the end edge 85 opposite the end edge 82. The pin 84 likewise projects beyond the inner side edge 83 of the panels 79-80 and is parallel to the pin 81. A pair of pins 86 are arranged between the panels 79-80 parallel to the pins 81-84 and projecting a similar amount beyond the inner side edges 83. The pins 81, 84, 86 are spaced apart exactly the same amount as the pins 44 on the panel 83. A wall 87 extends between the pin 81 and the pin 86, between the two pins 86, and between the pin 84 and the pin 86 as can be seen in FIGS. 22 and 23. A wall 88 extends between the pin 84 and the pin 81 along the outer side edge 89 of the support 78 to completely enclose the space between the panels 79-80 except for the space between the end edge 82 and the pin 81. The space between the panels 79-80 extending from the pin 81 to the end edge 82 provides room for the pins 44 on the panel 43 when the panel 43 is offset to one side on the table 46 as illustrated in FIG. 3.

A pneumatic mattress 90 of generally rectangular form may be used on the table 46 to support the horse H when desired.

In practicing the method of the invention the horse H is led into a recovery room 34 and is stood along side of and in engagement with one of the padded walls 37 while anesthesia is fed into its vein from a bottle B supported on the padded wall 37. The animal is allowed to fall while being supported loosely against a padded wall so that a soft fall on the padded floor results. The animal is then placed in lateral recumbency and the table 46 is rolled into the recovery room 34 from the operating room 33.

The horse is then rolled into dorsal recumbency by grasping the forelegs and the hindlegs and moving them upwardly. The table is then rolled closely adjacent the horse and it is rolled onto the table into a lateral recumbency position. The extreme low height of the table 46 on its casters 48 permit the horse to be rolled onto the table 46 without difficulty. Panels 43 are then inserted at suitable places about the table 46 to support the legs and head of the horse H as can be seen in FIG. 3. The invertable support 78 is positioned adjacent the horse's shoulders to assist in supporting the horse as required. It should be noted that the invertable support 78 can be attached at any point to the table 46 with either side up to give the desired support shape. The handles 61 are then attached to opposite ends of the table 46 to permit two men to manipulate the table 46 into the operating room 33 and over the support platform 40. With the table 46 aligned with the support platform 40 the latch bars 59 are swung into locking position as can be seen in FIG. 8 to secure the table 46 and the support platform 40 together.

Now with the table 46 and the horse at floor level in the surgery room 33 the endotracheal tube is passed and anesthesia is continued with Halothane. After ade-

quate depth of anesthesia is obtained, the animal is either left in later or placed in dorsal recumbency, and the table is elevated by the hydraulic lift 38 to whatever height is desirable for the procedure that is to be performed. If lateral recumbency is indicated, lightweight supporting panels 43 are applied to the side. These are adjustable along the sides and conform to the size of the horse. If there is some need to roll the animal during a surgical procedure the table is lowered to the floor level for easier manipulation and the animal is merely rolled into the opposite direction. Detachable panels 43 are then applied to the opposite side of the table and the detachable head and shoulder panels are placed into their proper position. In this manner the horse does not have to be rolled and then turned in the opposite direction in order to conform to the shape of the table 46. Assuming dorsal recumbency is indicated the horse is rolled into position by two men and a third man attaches four slip-off adjustable chocks to the table, one on either side of the withers and one on either side of the hip. The head support panel 43 is moved into a central position to sustain the head and the neck while the animal is in dorsal recumbency. With lateral recumbency small sterile nylon ropes are used to tie down the limbs. In dorsal recumbency no ropes are used whatsoever.

Since ropes are not necessary, the body circulation of the anesthetized patient is not impaired, contamination is minimized, and adequate draping of the surgical site is more readily performed. In addition, the surgical team may operate on either side of the animal while in dorsal recumbency. In doing abdominal procedures, it is desirable to stand one surgeon on each side of the table. Thus, the entire thorax, abdomen and scrotal area are readily accessible to the surgeon. Following surgery the table is lowered to floor level, the detachable handles are re-inserted and the animal is returned to the recovery room 34 where it is rolled from the table onto the padded floor.

It should be noted that the simple design of this apparatus lends itself to chemical disinfection. Heavy belts, platforms and absorbent padding are not used; all parts slip securely into place with a minimum of dirt and germ collection recesses. In addition, a pneumatic mattress 90 is used as a padding device and it too is readily disinfected. The pneumatic mattress 90 may if desired have alternating pressure gradients which can be maintained through a tubular arrangement in the mattress. This would allow for improved peripheral circulation at

the pressure point in the body. It has been found that the body does not perspire on its down side during surgery, indicating that tissue breakdown and subsequent acidosis are minimized.

It should be noted that the hydraulic piston 39 may be rotated on its own axis to properly position the surgical top 46.

Having thus described the preferred mechanical apparatus and the preferred method it should be understood that numerous modifications and adaptations may be resorted to without departing from the spirit of the invention.

I claim:

1. An animal handling apparatus for surgical procedures comprising a table, detachable rigid handles secured to opposite ends of said table for manipulating said table, said table including a flat metal plate having along its peripheral edge an integral depending flange with a plurality of evenly spaced bores extending horizontally through said flange, a plurality of casters secured to the lower surface of said plate supporting said table from the floor, a panel member, a plurality of pins rigidly secured to said panel member in spaced apart parallel relation and extending beyond one end edge thereof with said pins having a diameter and spacing to be received in the bores in said flange for detachably securing said panel to said table, and an invertible support including a pair of spaced parallel panels, pins arranged in spaced parallel relation between said panels and secured thereto with said pins extending beyond one side edge of said panels, said pins having a diameter and spaced apart a distance so as to be received in the bores in said flange to secure said invertible support to said table in adjusted position thereabout.

2. A device as claimed in claim 1 wherein manually rotatable latch means are provided on said table for rigidly and releasably securing said table to a support platform lift.

3. A device as claimed in claim 1 wherein depending legs are secured to opposite corners of the lower surface of said plate on said table along one side edge thereof for supporting said table with said casters out of contact with the floor, and means for retracting said legs to permit said casters to engage the floor.

4. A device as claimed in claim 1 wherein said handles each has a pair of horizontally extending pins insertable through the bores in said flange for detachably securing said handles to said table.

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