United States Patent

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[54] **PELVIC OPENING ENLARGER**
6 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **128/361**
[51] **Int. Cl.** **A61b 17/42;** A61d 1/08
[50] **Field of Search** ..... 128/303, 345, 352, 361, 1, 17—19, 69, 31; 254/132

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ABSTRACT: A lever device including a lever handle, a pair of outwardly diverging braces pivotally connected to an intermediate length of the lever handle, the outward ends of these braces being adapted for supporting contact by hip bones. A generally U-shaped member is pivotally connected to the handle member and adapted to underlie the sacrum of a skeletal frame. Downward displacement of the handle means causes upward pivotal rotation of the U-shaped member accompanied by the generation of forces in an outward direction against each hip bone thereby forcing them apart and enlarging an associated pelvic opening.

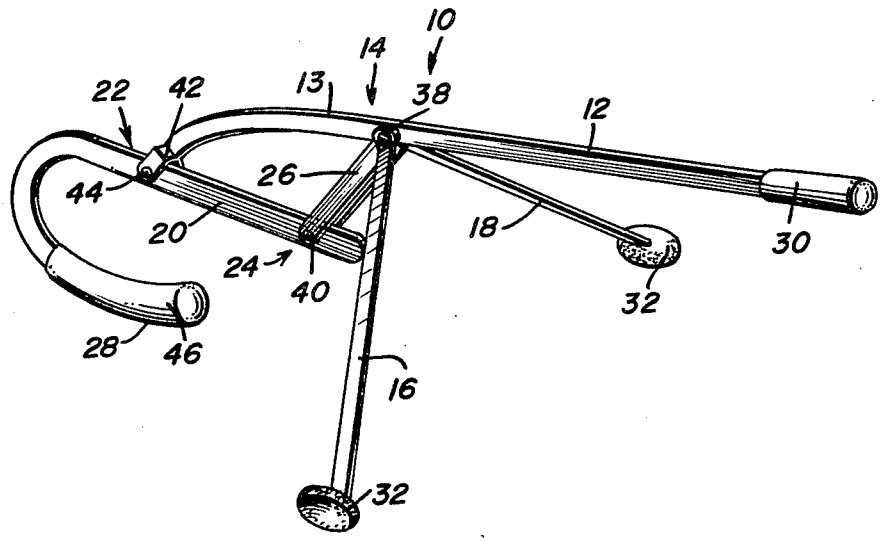

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Fig. 1

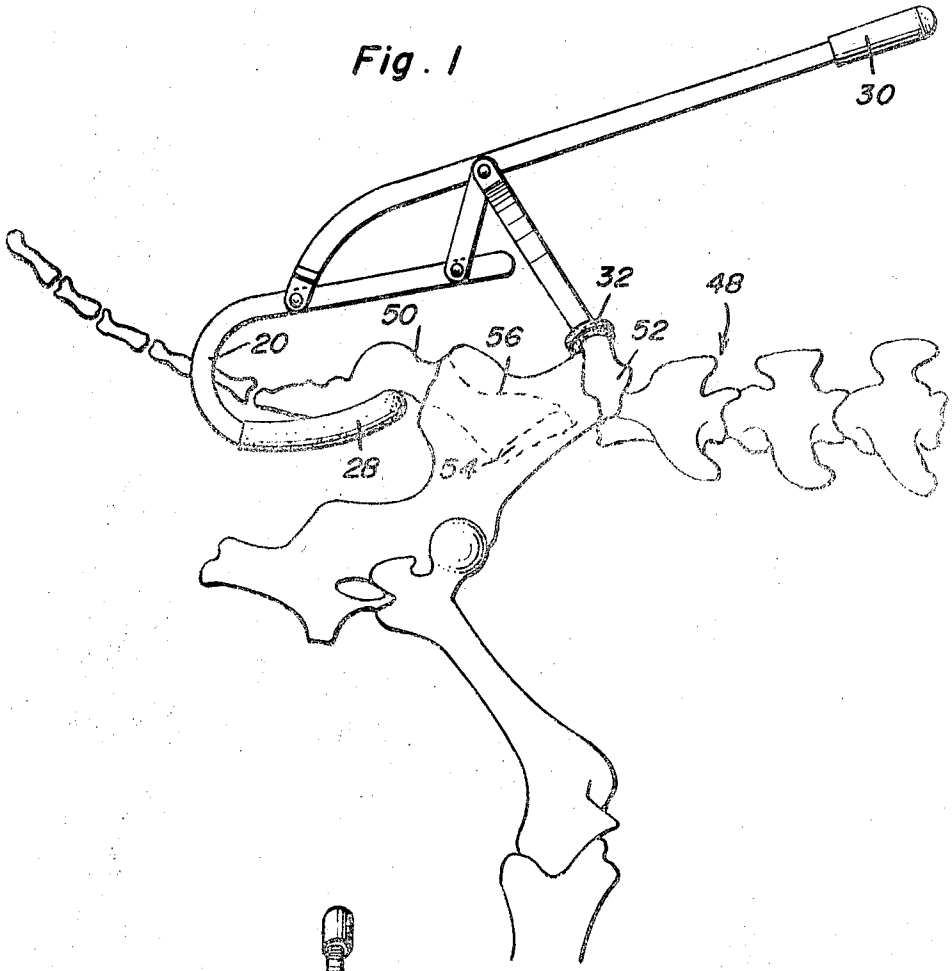

Fig. 2

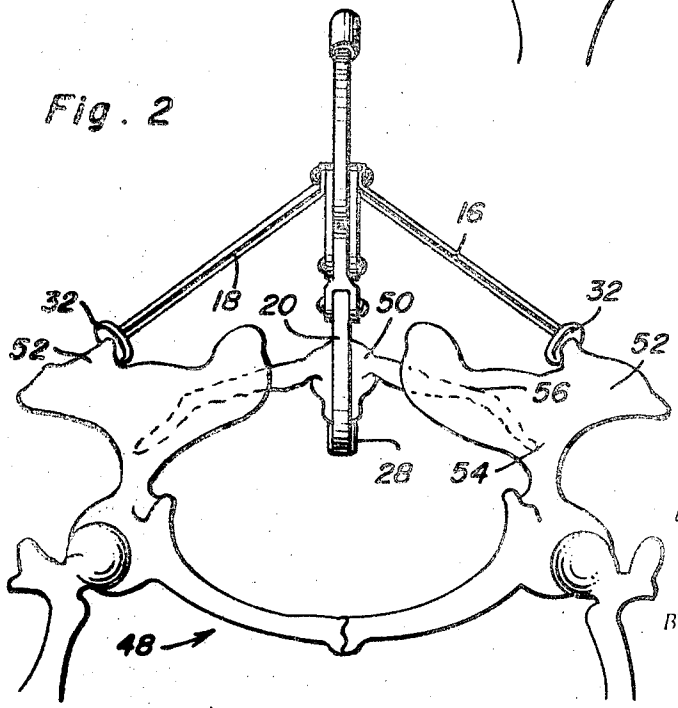

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Fig. 3

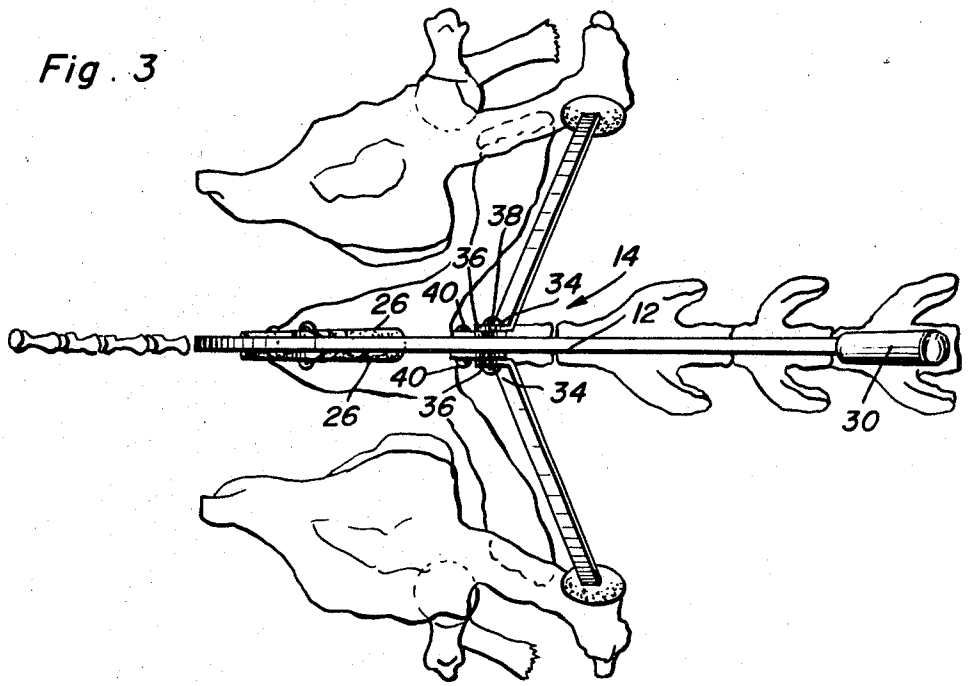
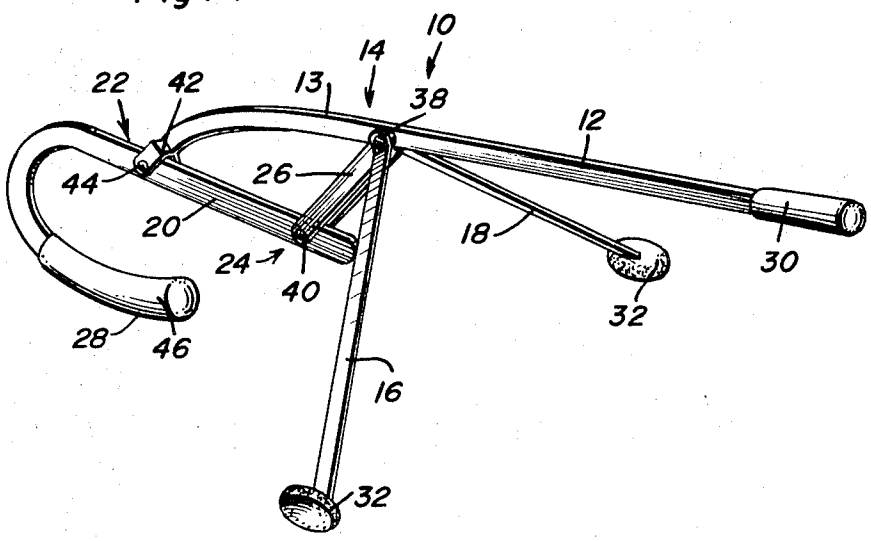


Fig. 4



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PELVIC OPENING ENLARGER

The present invention relates to surgical instruments and more particularly to an instrument for enlarging a pelvic opening.

Surgical instruments utilized during the delivery of offspring in mammals is old in the art. However, these instruments have generally been of a type which renders a brute force pulling of the offspring from a pelvic region. Tensile forces so encountered by the offspring are often substantial enough to cause damage or death to the offspring. This type of procedure is required during birth when the pelvic region through which the offspring must pass is not of sufficient cross-sectional area to permit free passage of an offspring therethrough. If the pelvic opening area is substantially smaller than required, the alternate procedure of Caesarean section is often utilized to surgically achieve removal of the offspring. As will be appreciated, both aforementioned methods involve considerable pain and danger to the delivering animal and its offspring.

The present invention is a lever type device which is externally actuated. A member of the device is inserted through the rectum of the animal until underlying engagement between the member and the sacrum of the animal is achieved. Brace members are provided to brace against the hip bones of the animal during actuation of the device. In operation of the device, the aforementioned member transmits an upward force against the sacrum and a downward force against the hip bones thereby causing enlargement of the pelvic opening. It is noted that the present device is simple in construction and lightweight thereby offering a compact reliable device. Further, its operation is painless and causes minimal or no body damage to a delivering animal and its offspring because the present device does not contact or apply forces to the fetus. Still further, the present invention eliminates the danger of surgery including infection associated therewith.

It is noted that the present device is described by the way of example in terms of its applicability to cows. However, it is stressed that the present device and the principle relative thereto could be readily adapted to other species of animals and human beings by adjusting the size and design of the device in accordance with the teachings of the present invention.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. **1** is a side elevational view of the present invention as applied to the skeletal frame of a cow;

FIG. **2** is a rear elevational view of the invention shown in FIG. **1**;

FIG. **3** is a top plan view of FIG. **1**; and

FIG. **4** is an enlarged perspective view of the present invention.

Referring specifically to the drawings, and more particularly to FIG. **4**, reference numeral **10** generally denotes the present lever device and is seen to include an elongated lever handle **12** having one end **13** thereof slightly curved downwardly. An intermediate length of the lever handle includes a pivot pin mount denoted by **14**. This mount provides means for pivotally securing one end of two downwardly and outwardly diverging brace members **16** and **18**. A generally U-shaped member **20** is oriented in a horizontal position with the arms thereof underlying the curved end **13** of lever handle **12**. One arm of the U-shaped member is pivotally connected as denoted by **22** to the curved end **13** of lever handle **12**. A second pivotal connection **24** is located at the outward portion of arm **20**, the pivotal connection providing intermediate means for mounting two parallel linkage members **26** between pivotal connections **24** and **14**. A second arm **28** of the U-shaped member is foreshortened with respect to the first mentioned arm and is retained in vertical coplanar relation with the first mentioned arm. It is noted that downward movement

of lever handle **12** causes an upward and inward rotation of arm **28** of the U-shaped member. A suitable gripping handle **30** fabricated from an elastomeric material or the like is placed over the free end of lever handle **12**. Further, swiveling pads **32** are suitably mounted to the free outward ends of braces **16** and **18** for reasons to become apparent hereinafter.

Referring to FIG. **3**, it will be noted that the pivotally connected braces **16** and **18** include mounting tabular portions **36** which are bent at an obtuse angle as indicated by **34** with respect to the intermediate length of the braces, and further include apertures therein for permitting passage of pivot pin **38** therethrough. The pivotal connection **24** shown in FIG. **4** is seen to include a single pivot pin **40** suitably secured to the parallel linkage members **26** at either end thereof. An associated portion of the U-shaped member **20** includes an aperture therein for receiving an intermediate length of the pivot pin. The pivotable termination **22** of curved lever handle end portion **13** is seen to include a generally U-shaped member **42** integrally attached thereto. The arms of the U-shaped member include horizontally aligned apertures for receiving a pivot pin **44** therein. The corresponding portion of U-shaped member **20** is retained between parallel arm portions of the U-shaped member **42**. It is noted from FIG. **4** that the completed invention includes an outwardly rounded smooth sleeve member **46** positioned over the associated or shortened arm of U-shaped member **20** and adapted for insertion into a rectum.

To understand the operation of the present device, reference is made to FIGS. **1** and **2** which illustrate the posterior or skeletal region **48** of a cow. This region is seen to include a sacrum **50** operatively associated with hip bones **52**. The backbone **56** is seen to contact hip bones **52** along a bearing surface defined as the sacroiliac articulation **54**. As further noted from FIGS. **1** and **2**, the lever handle of the present invention is disposed in overlying relation with a cow's posterior region with the gripping handle **30** facing the animal's head. The tab terminations **32** of braces **16** and **18** are adjusted to securely seat upon the hip bones **52** of the animal. The foreshortened arm of the U-shaped member **20** is inserted through the rectal opening (not shown) parallel to the backbone until it is beneath the posterior end of the sacrum. The upper arm of the U-shaped member **20** lays externally on the back of the animal. Downward pressure applied to the lever arm raises the posterior end of the sacrum and disarticulates the hip bones from the backbone at the left and right sacroiliac articulation surfaces. Downward pressure on the lever simultaneously applies forces in an outward direction against each hip bone thereby forcing them apart and enlarging the pelvic opening for the desired end result.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

I claim:

1. A device adapted to enlarge an animal's pelvic opening comprising a plurality of brace members having mutual first ends to be positioned against the exterior of the animal's hip bones, insertion means for internally engaging the animal's sacrum, and connective means joining the brace members to the insertion means, the connective means being movable for causing disarticulation of the hip bones from the backbone at the left and right sacroiliac articulation surfaces accompanied by outward displacement of the hip bones which results in an enlarging of the pelvic opening.

2. A lever device adapted for enlarging a pelvic opening comprising lever handle means, a plurality of brace means pivotally connected at respective ends thereof to said handle means, intermediate the ends of said handle means, the opposite end of said brace means adapted for support by hip bones, a generally U-shaped member having first and second arms thereof, the free ends of said arms extending in a

direction generally parallel to the longitudinal axis of said handle, and means pivotally connecting said first arm to said handle means, said second arm adapted for underlying engagement with a sacrum, wherein rotation of said lever handle means causing disarticulation of the hip bones from a backbone at the left and right sacroiliac articulation surfaces, said handle rotation further causing outward displacement of the hip bones thereby enlarging the associated pelvic opening.

3. The apparatus set forth in claim 2 wherein said means pivotally connecting said first arm portion to said handle means firstly includes linkage means pivotally connected between an end portion of said arm and the pivoted connection between said handle means and said brace means, and secondly includes pivot means connecting one end of said handle means to an intermediate length of said first arm portion.

4. The apparatus set forth in claim 2 wherein each said end of the braces supported by the hip bones has an adjustable swiveling pad mounted thereon.

5. The apparatus set forth in claim 2 wherein said plurality of brace means include a pair thereof diverging outwardly from said handle means.

6. A method for enlarging the pelvic opening of an animal comprising the steps of exerting symmetrical forces against the animal's hip bones, and simultaneously exerting an outward pelvic force on the sacrum causing disarticulation of the hip bones from the backbone at the left and right sacroiliac articulation surfaces accompanied by outward displacement of the hip bones thereby enlarging the pelvic opening.