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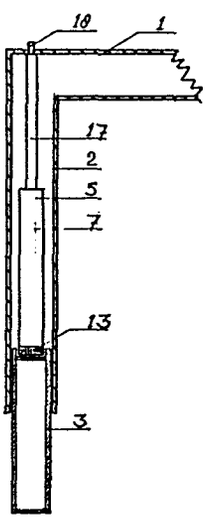
(54) Nursing bed.

(57) This nursing bed comprises gassprings (5) located between sliding parts (2, 3) of telescopic legs. Locking and releasing means (18) are provided. Calibrating means (13) adapted to counterbalance the difference of weight of potential patients are also provided.



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NURSING BED

The invention relates to nursing beds more particularly to adjustable beds of the type normally used in hospitals or old people's homes and also by particular for nursing invalids or sick persons.

Such beds are wellknown but generally have embodied complicated mechanisms which add considerably to the cost of the bed as for instance electrical motors or present maintenance problems as hydraulic systems.

Some systems have been developped which use counterbalancing springs. For instance the Dutch specification 71 05 381 relates to an adjustable height bed but it had not found acceptance because the system is too expensive to manufacture. The US patents 3 039 118 and 2 698 442 describe hospital beds in which counterbalancing springs are located in the legs of the bed. The action of the springs are coordinated by cables or a locking system acts on two legs at the end of the bed. In the first case the bad is only adjustable in height and in the second case the bed can also be tilted but only in a longitudinal direction.

An other drawback of those constructions is the use of mechanical springs. As a matter of fact the strength of the spring is maximal when full compressed but becomes to be inefficient after a short way.

The principal object of the present invention is to provide an improved and pratical nursing bed construction in which the height and tilting of the mattress support may be easily achieved.

An other object of the invention is to provide a very simple nursing bed construction in which the tilting of the mattress support may be easily achieved around an infinity of axis.

An other object of the invention is to provide an improved adjustable height and tilting nursing bed which may be simply and inexpensively produced.

To achieve these objects, the nursing bed of the present invention which comprises a mattress support and at least two telescopic legs is provided with gas springs mounted between the sliding parts of the legs, with locking means and releasing means for the gas springs.

So mounted, the gas springs which can work independently one from the others counterbalance the weight of the mattress support and the weight of the patient. The locking means acting on each gas spring allow to obtain for the mattress support a predetermi-nated position chosen among an infinity of height and tilting positions. The releasing means allow the nurse to modify the position of the mattress support without effort.

The invention will be better understood and still further objects and advantages will become apparent from the following description of the prefered embodie-ment with reference in the drawings which are part of the invention and in which :

- Figure 1 is a perspective view of a nursing bed with telescopic legs,
- Figure 2 is a cross-section view of one of the legs of the nursing bed embodying the invention,
- Figure 3 is a cross-section view of a gas spring provided with calibrating means according to the invention,
- Figure 4 is a cross-section view of one of the legs of the nursing bed embodying the invention in which the gas spring is provided with valve system locking means,
- Figure 5 is a side elevation view of joined up releasing means according to the invention and
- Figures 6, 7 and 8 are schematic views of some of the possible ways of joining up the releasing means.

As illustrated on figure 1, a nursing-bed comprises a mattress support 1 and four telescopic legs with sliding parts 2 and 3. So as to fix a predeterminated length for each leg locking means are provided.

Such nursing bed is wellkmown as described, for instance, in the French patent 1 168 393. In this patent, the avthor recommends the use of a lifting jack to counterbalance the weight of the patient. Thus the use of this bed is not easy and presents the same drawbacks than above cited patents

According to the invention a gasspring 5 is provided between sliding parts 2 and 3 of each telescopic leg. So when the locking mean 4 is unlocked gasspring 5 tends to raise the support mattress against its and patient weight. If well chosen gasspring 5 allow the nurse to lift or lower the bed without effort.

According to the fact that each gasspring works independently and in a continuous way, it is possible to obtain an infinity of height and tilting positions. In particulair, tilting may occur around a longitudinal axis, or transversal but also around any other axis between the two precited at right angle axis. In fact, potential patients in hospitals may have very various size and weight.

The figure 3 shows a gasspring provided with calibrating means adapted to counterbalance the difference of weight of potential patients. This gas-spring presents a cilinder 7 defining an in_er chamber 8 filled with compressed gas so as to push awaya piston 9 slidingly located in the cilinder 7. At the end of the cilinder 7 located opposit to the active piston 9 is provided an adjustable piston 10 which allows to modify the compression of the gas in chamber 8.
Under piston 10 are fixed two legs 11 between the extremities of which is weld a nut 12.
Under the cilinder 7 is located a milled headed screw 13 which cooperates with the nut 12.

A clip 14 prevents piston 10 to be pushed out of cilinder 7 by compressed gas. By turning screw 12 piston 10 slides in cilinder 7 modifying the volume of chamber 8 thus modifying the compression of gas within chamber 8.
To prevent piston 10 to rotate with screw 12, a guid system 15, 16 is provided. In stead of mechanical locking and releasing means may be used wellknown valvesystem the control mean 18 of which is located upon the stang 17 of the active piston as it can be seen in figure 4.
With such a system may be used releasing means as shown in figure 5. Releasing means comprise levers 19 pivoted on mattress support 1 by means of axles 20. Lever 19 comprises a flat portion 21 adapted to push on control mean 18 and a prehension portion 22 extending away from lever 19. The advantage of these levers consists in the fact that they may be joined up so as to act on two or more locking means. For instance, it may be seen in figure 5 that raising the prehension position 22 of lever A will also raise prehension 22 of lever B and flat portion 21 of lever A will lower flat position 21 of lever C the prehension portion 22 of which will raise prehension portion 22 of lever D.
By judicious positioning of levers it is possible to act on 1, two or all of gassprings as it may be seen in figures 6,7 and 8 in which levers noted A to H act on gassprings noted 1 to 4 as reported in tables.

It is evident that many other dispositions may be adopted and the preferred embodiments shown in figures 6 to 8 have been given as examples and do not constitute a limiting list.

CLAIMS

1 - Nursing bed comprising a mattress support 1 and at least two telescopic legs characterized by :
- gassprings (5) mounted between the sliding parts (2,3) of the telescopic legs so as to balance the weight of the mattress support (1) and the weight of the patient, said gassprings (5) being able to work independently one from the others in such a continuous way that the mattress support (1) can take an infinity of height and tilting positions.
- locking means (4,18) for the gassprings (5) adapted to give a particular lenght at each leg so as to obtain for the mattress support (1) a predeterminated position chosen among the infinity of height and tilting positions and
- releasing means (4, 19) for the gassprings (5) adapted to allow the nurse to modify the lenght of the legs without effort in a continuous way so as to obtain for the mattress support (1) a new position chosen among the infinity of height and tilting positions.

2 - Nursing bed according to claim 1, characterized by the fact that gassprings (5) are provided with calibrating means (10, 16) adapted to counterbalance the difference of weight of potentional patients.

3 - Nursing bed according to claim 2, characterized by the fact that the calibrating means (10,16) comprise an adjustable piston (10) located at the end of the cylinder (7) opposite to the active piston (9) so as to modify the compression of the gas in the cylinder (7).

4 - Nursing bed according to claim 1, characterized by the fact that the locking means comprise a valve-system with a control mean (18) located at the top of the active piston (9).

5 - Nursing bed according to claim 1, characterized by the fact that the releasing means (19) may be joined up so as to act on two or more of the

locking means.

6 - Nursing bed according to claim 5, characterized by the fact that releasing means(19)are joined up on such a way that acting on one of the releasing means acts on all the locking means(18)

7 - Nursing bed according to claim 5, characterized by the fact that releasing means(19 are joined up on such a way that acting on one of the releasing means acts on one or two or all the locking means(18).

I/V

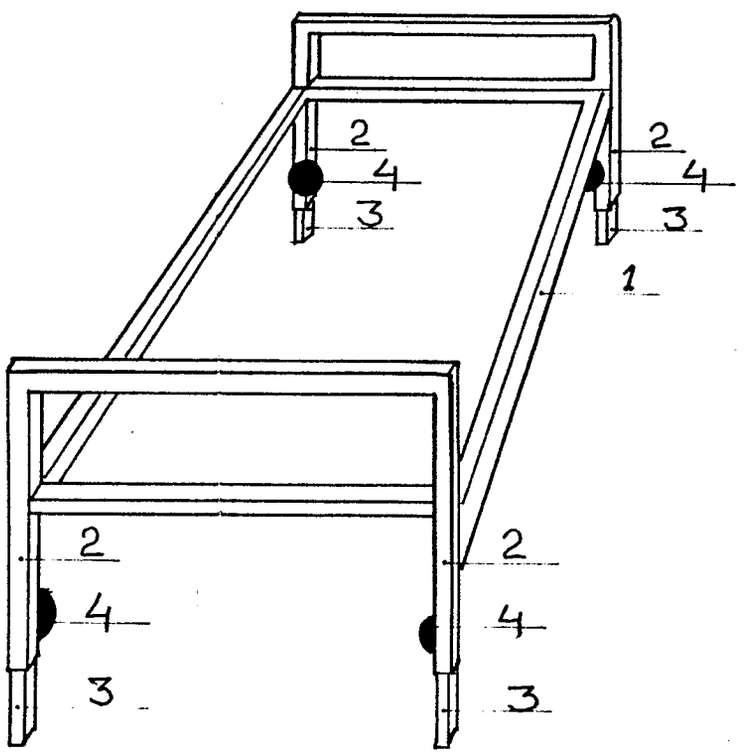

FIG-1

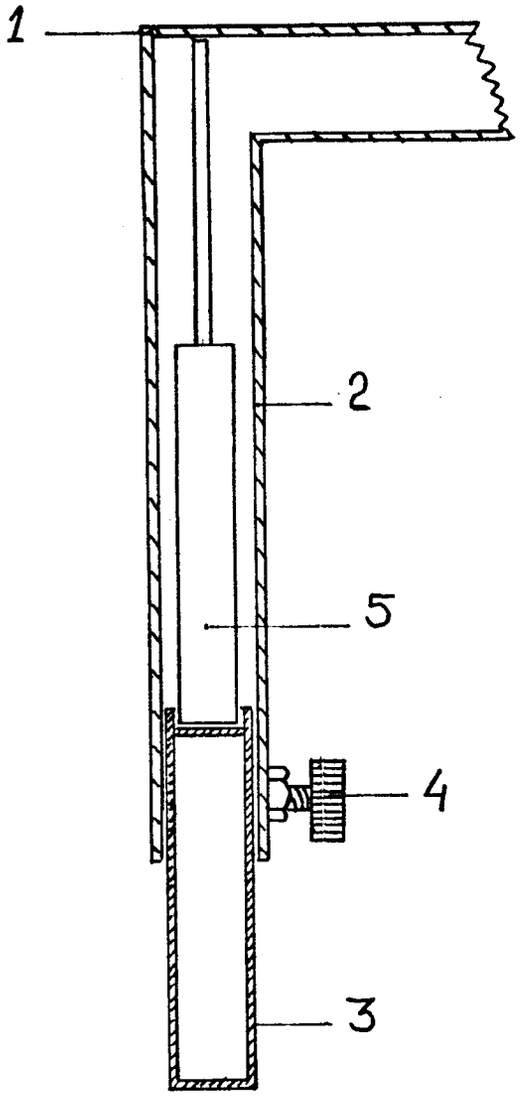

FIG-2

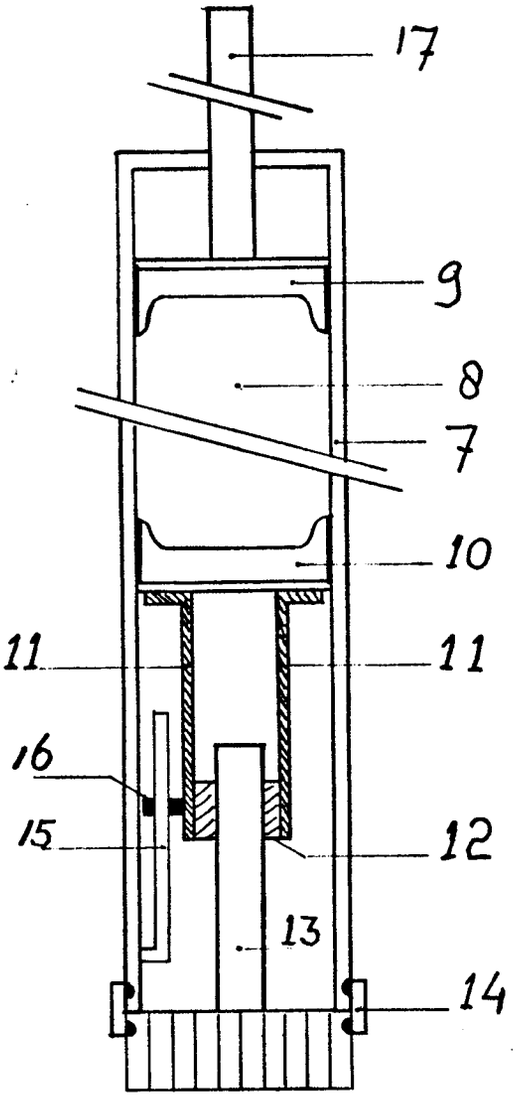

FIG-3

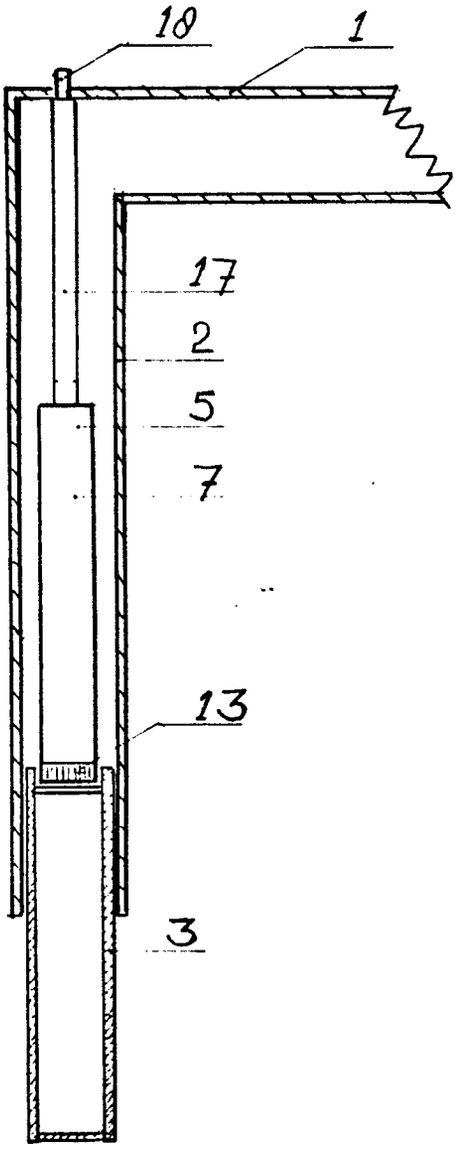

FIG-4

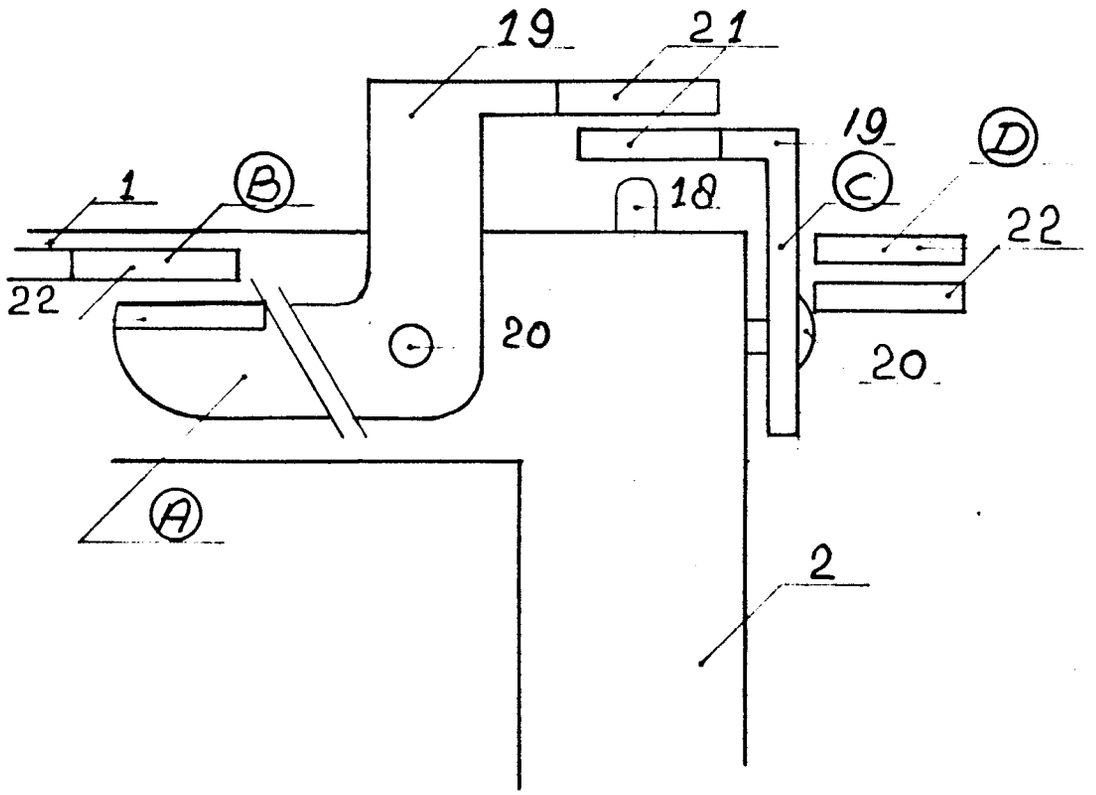

FIG-5

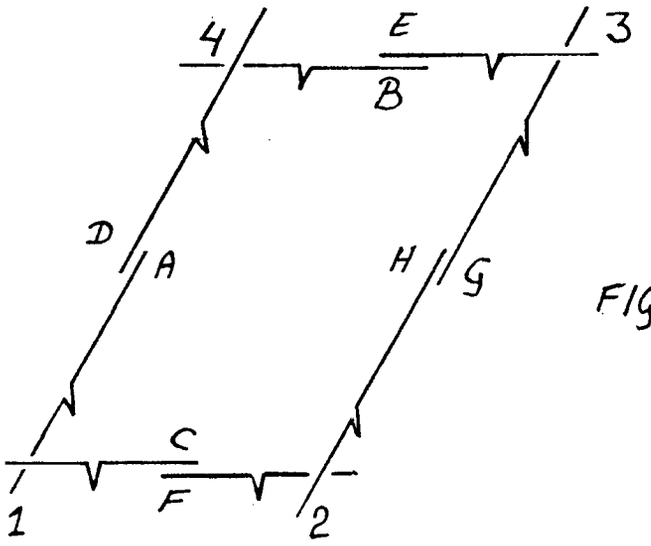

FIG-6

	1	2	3	4
A	X	X	X	X
B	X	X	X	X
C	X	X	X	
D	X	X	X	X
E	X	X	X	X
F	X	X	X	X
G	X	X	X	X
H	X	X	X	X

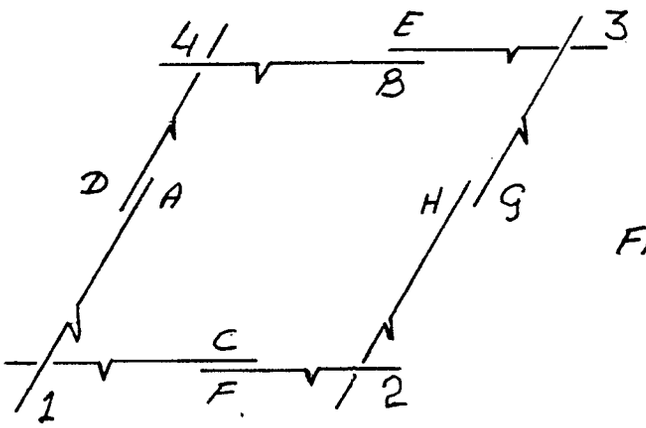

FIG-7

	1	2	3	4
A	X			X
B			X	X
C	X			
D				X
E			X	
F	X	X		
G		X	X	
H		X		

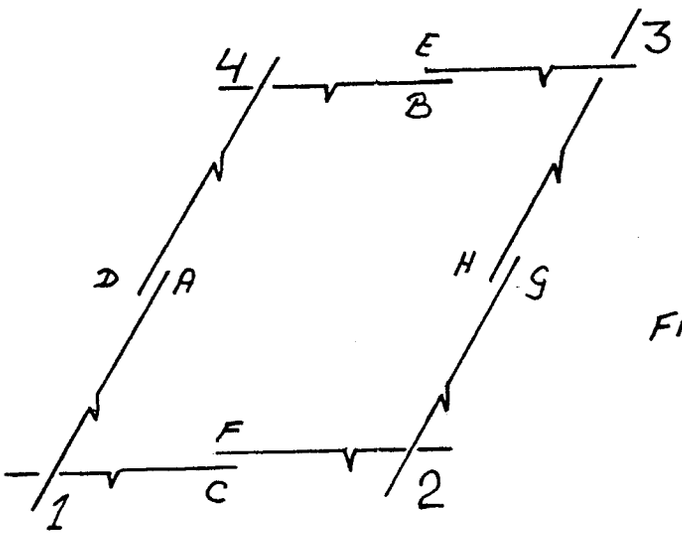

FIG-8

	1	2	3	4
A	X	X	X	X
B			X	X
C	X	X		
D			X	X
E			X	
F		X		
G			X	
H		X	X	

European Patent Office

EUROPEAN SEARCH REPORT

0141881
Application number

EP 83 20 1634

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A,D	US-A-2 698 442 (TRAVIS) * Column 1, lines 15-36; column 2, lines 34-76; figures 1,2,6 *	1	A 61 G 7/00
A,D	US-A-3 039 118 (HUTT) * Column 2, lines 52-65; column 3, lines 1-15; figures *	1	
A,D	FR-A-1 168 393 (LE LIT TOUS SOINS) * Page 1, left-hand column, lines 11-16; figures 1,2 *	1	
A	DE-A-2 030 024 (BREMSHEY & CO.) * Page 2, lines 15-18; page 9, line 12 - page 10, line 8; figures *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
A	FR-A-2 167 190 (BREMSHEY AG) * Page 3, lines 35-38; page 4, lines 13-34; figures 1-3 *	1	A 61 G A 47 C
A,D	NL-A-7 105 381 (BATAVUS RIJWIEL- EN MOTORENFABRIEK N.V.) * Page 2, lines 3-27 *	2	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28-06-1984	BAERT F.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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E : earlier patent document, but published on, or after the filing date
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