United States Patent [19]

Bjork

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[54] **DRAWING TABLE WITH DRAWING BOARD RELIEVED BY GAS SPRING**

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Related U.S. Application Data

[63] Continuation of Ser. No. 312,237, Dec. 4, 1972, abandoned.

[52] **U.S. Cl.** **248/162;** 248/400; 248/411

[51] **Int. Cl.**[2] **A47B 27/16**

[58] **Field of Search** 248/162, 161, 399, 400, 248/404, 411, 414; 297/345, 347; 188/67, 129

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[57] **ABSTRACT**

A drawing table with a support device for the drawing board comprising a telescopic column means in which a gas spring is provided to substantially entirely support the weight of the drawing board, characterized in that the gas spring includes a valve for the supply of gas to or the removal of gas from the gas spring.

2 Claims, 3 Drawing Figures

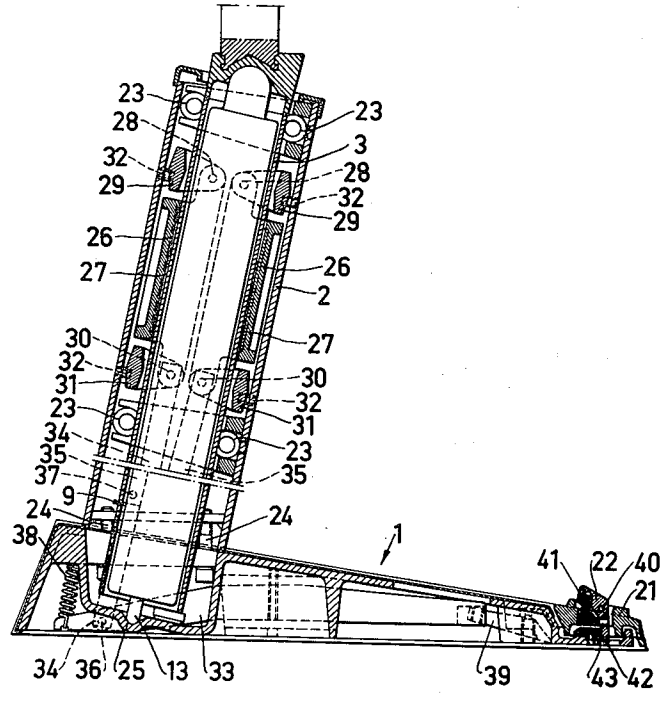


FIG. 1

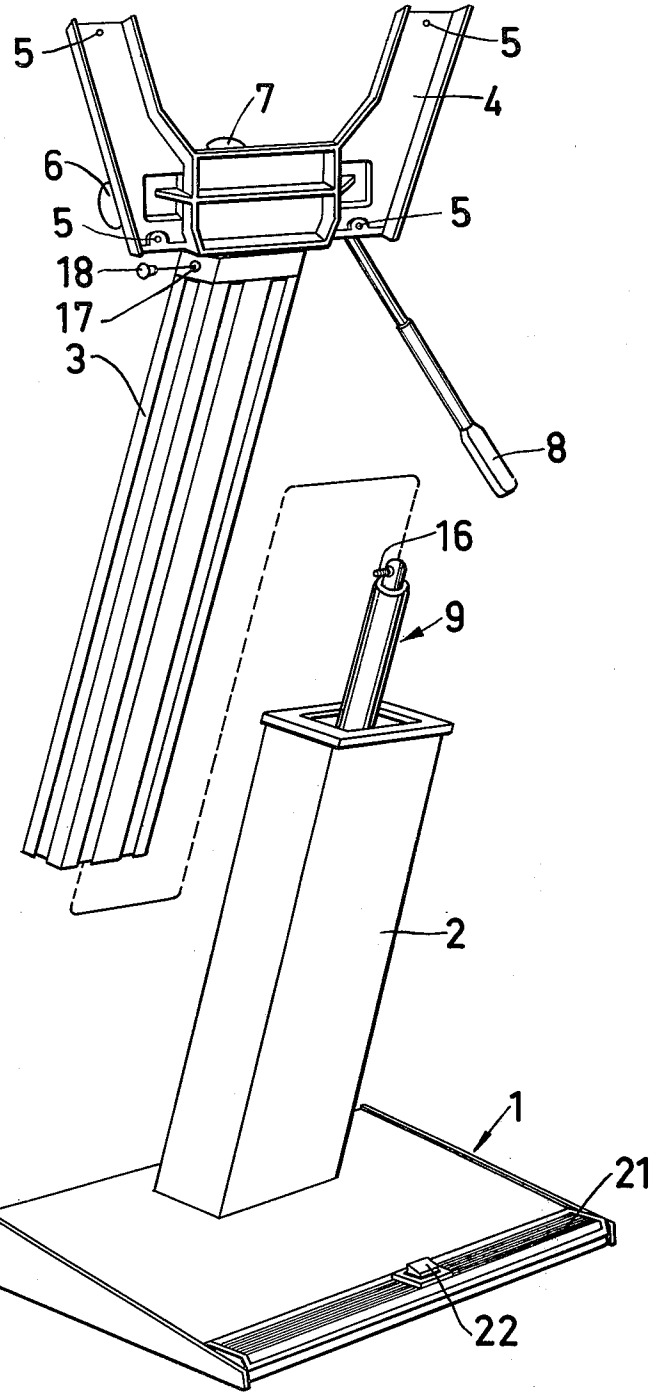


FIG. 2

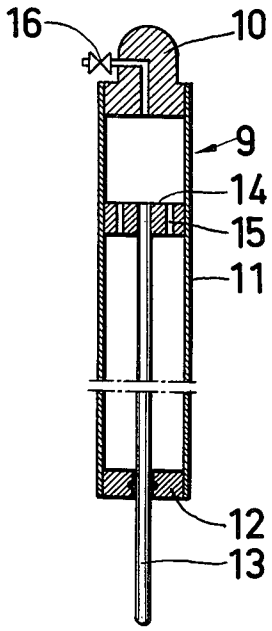
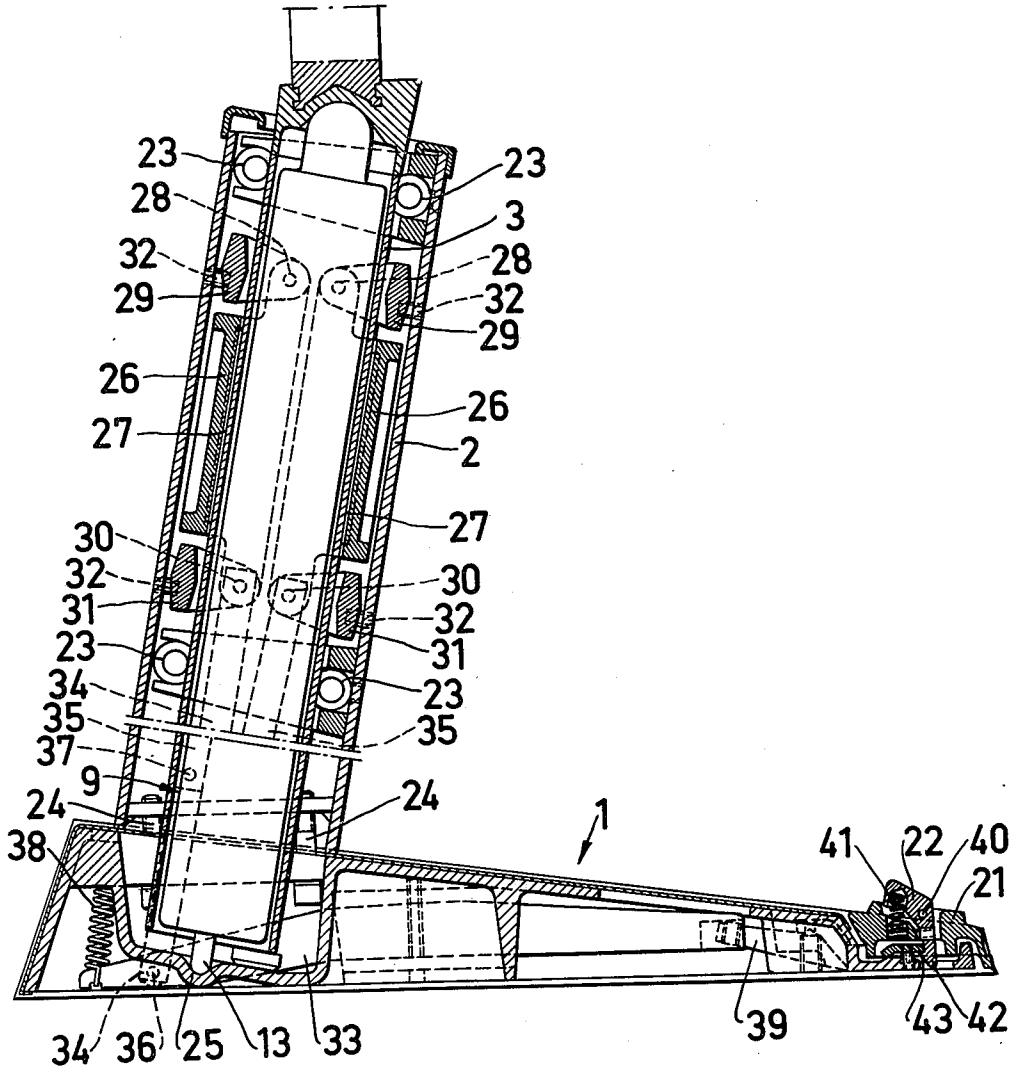


FIG. 3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DRAWING TABLE WITH DRAWING BOARD RELIEVED BY GAS SPRING

This is a continuation of application Ser. No. 312,237, filed Dec. 4, 1972 now abandoned.

Gas springs comprising a cylinder charged with a gas tending to press a rod out of one end of the cylinder are in many technical conjunctions often applied because of their low space requirement, instead of, for example, helical springs. Due to their special construction, the gas springs are supplied in ready state charged with gas and do not permit a later change of the gas charge. For different purposes, therefore, different gas springs are supplied.

Gas springs of this kind are also utilized for supporting the load of drawing boards at drawing tables in order to facilitate height adjustment of the drawing board. It is, however, necessary to choose for different sizes of drawing tables different springs so as to obtain optimum balancing, which nevertheless is only a coarse balancing. When the drawing board then is equipped permanently with, for example, drawing instruments of a weight different from that used previously, the only possibility of improving the balancing, if it was deteriorated by said change of instruments, is to exchange the gas spring against another one.

The aforesaid disadvantages are eliminated with the drawing table according to the present invention by its characterizing features. It is thereby possible, for example, to use for different sizes of drawing tables only one single size of gas springs, in such a manner, that the spring force required for the drawing table in question is brought about by filling the spring with a corresponding gas quantity. The drawing table, for example, can be delivered with an excess pressure in the gas spring, and later on, after the equipment of the drawing board has been determined, so much gas is discharged that the desired balance is obtained. If in the beginning one may have the impression that too much gas has been discharged, this will be corrected after a short time, because the gas pressure will rise due to the rise in gas temperature after the temperature drop caused at the gas discharge.

One embodiment of the invention is described in the following, with reference to the accompanying drawing, in which

FIG. 1 in a perspective view and in dismounted state, with the end of a gas spring visible, shows the stand supporting the drawing board of the drawing table,

FIG. 2 in a schematic way shows a gas spring such as used at the invention, and

FIG. 3 shows the stand of the drawing table by a vertical section.

In FIG. 1 the numeral 1 designates the base plate on which a forwardly inclined column 2 with rectangular cross-section is mounted. Within said column 2 a tube 3 is movably guided, which also has rectangular cross-section and at its upper end supports a holder 4 for the drawing board proper, which is intended to be secured by being screwed into holes 5 in the holder 4. The drawing board with holder 4 is rotatably adjustable about a joint 6 with horizontal axle and about a joint 7 with vertical axle. The drawing board is released and locked in the joints 6 and 7 by means of a lever 8.

The tube 3 rests by its own weight and by the weight of the details supported thereon on a gas spring 9 in the column 2. The gas spring 9, as shown in FIG. 2, comprises a cylinder 11, which at its upper end is closed by an end piece 10. At the lower end of the cylinder 11 an end wall 12 is fastened, through which extends a rod 13, which is movably guided in the cylinder 11 by a plunger-like member 14 with passage-ways 15, through which the spaces on both sides of said plunger-like member 15 freely communicate. The cylinder 9 is filled, for example, with nitrogen gas of a pressure such high that the weight of the tube 3 with associated details is substantially entirely relieved by the gas spring. The rod 13 must have a small cross-section relative to the cylinder 11 whereby the gas spring force is substantially constant along the entire stroke of the rod 13. At the drawing table according to the invention it was possible in practice to permit such area relations between the rod 13 and cylinder 11 that the force of the gas spring changes only by 2 percent between the two end positions of the rod.

The spring 9 is provided at its upper end with a suitable valve 16 for the supply and removal of gas to the spring 9 in order thereby to change the spring force. The valve 16 is accessible at the tube 3 in mounted state in the column 2 through an opening 17 in the upper portion of the tube 3, which opening can be closed by a cover 18.

On the base plate 1, along its forward edge a pedal 21 is provided which upon depression locks the tube 3 relative to the column 2 by locking means located in the column 2. The tube 3 is released by depression of a release means 22 provided on the pedal 21.

In FIG. 3 the tube 3 is guided on its four sides in the column 2 by wheels 23. The column 2 is fastened downwardly on the base plate 1 by screws 24 screwed in from the lower side of the base plate 1. The gas spring 9 arranged in the tube 3 abuts by its rod 13 a seat in the form of a depression 25 in the base plate 1.

The tube 3, as already mentioned, is adapted to be locked in the column by locking means. Said locking means comprise a pair of brake shoes 26, which by friction lining 27 are adapted to engage with the tube 3 on two opposed sides thereof. The brake shoes 26 enclose in U-shape manner each one half of the tube 3 and are upwardly at their legs in joints 28 connected each to an upper U-shaped link member 29 and downwardly at their legs in joints 30 connected each to a lower U-shaped link member 31. Into the upper link members 29 as well as into the lower link members 31 project pins 32, which are secured in the column 2 and effect rotatability of the link members 29 and 31 about horizontal axles, which are substantially perpendicular to the plane of FIG. 3 and extend through the inwardly directed ends of the pins 32. The lower joints 30 of the brake shoes 26, together with the lower link members 31, are connected on both sides of the tube 3 to the end of a lever 33 in the base plate 1 by means of a rearward rod 34 and a forward rod 35, of which the rearward rod 34 is connected in a joint 36 on the lever 33 and the forward rod 35 in connection with the rearward rod in a joint 37 a small distance above the joint 36. The lever 33, furthermore, is connected at its end located at the joint 36 to a tension spring 38 tending to lift said end. The lever 33, which approx. at its centre is rotatable about a substantially horizontal axis, is adapted for actuation at its other end by an additional lever 39.

In FIG. 3, farthest to the right, the pedal 21 and the release member 22, which were mentioned in conjunction with FIG. 1, are shown. The member 22 is rotat-

ably mounted on the pedal **21** about a horizontal axle **40.** A compression spring **41** tends to turn a portion of the member **22** which is provided with a hook **42** against a locking shoulder **43** rigidly mounted in the fixed portion of the base plate **1.**

The tube **3** with the drawing board is locked and, respectively, released in the manner as follows. Upon depression of the pedal **21,** the left-hand end of the lever **39** moves upwards and thereby lifts the right-hand end of the lever **33,** the left-hand end of which is lowered against the action of the spring **38** and pulls the rods **34** and **35** downwards. Hereby, because of their support in the link members **29** and **31,** the shoes **26** are pulled downwards and inwards towards each other and the tube **3,** thereby locking said tube. The pedal **21** is then maintained in depressed position by the hook **42** which at fully depressed pedal **21** engages below the locking shoulder **43.**

At the release of the tube **3** with the drawing board the release member **22** is depressed, so that the hook **42** disengages from the shoulder **43.** Thereby the pedal **21** is released and the left-hand end of the lever **39** is not longer held pressed upwards. The spring **38,** provided that first the tube **3** with the drawing board has moved and, respectively, been lifted somewhat upwards, lifts up the left-hand end of the lever **33** with the rods **34** and **35.** Thereby the shoes **26** move upwards and outwards and are disengaged from the tube **3.** It is, thus, only the force of the spring **38** which can effect a release of the tube **3.** The shoes **26** are by their mounting self-locking to downwardly directed forces transferred from the tube **3** to the column **2.** The object thereof is to ensure that the brake effect of the shoes **26** does not suddenly cease, if for some reason the gas in the gas spring **9** should leak out. By their mounting in the manner shown in FIG. **3,** the shoes upon an increasing downwardly directed force from the tube **3** to the column **2** are taken along some distance further downwards and inwards and are given a still firmer hold about the tube **3.** To effect in such a case the relase of the tube **3** from the column **2,** it is not sufficient with the spring **38** to loosen the shoes **26,** but the drawing board with the tube **3** must first be lifted up somewhat to enable the shoes **26** to disengage whereafter the drawing board is to be lowered by hand. The spring **38,** thus, together with the self-acting shoes **26,** constitutes a safety arrangement, which prevents that at the release of the tube **3** release forces can act upon the shoes which are in excess of those forces permitted to satisfy the self-locking action of the shoes.

What I claim is:

1. A drawing table with a support device for the drawing board comprising in combination

a. a telescopic column means,

b. brake means for rigidly interlocking said telescopic column means,

c. a gas spring located within the telescopic column means which gas spring is preloaded with a pressure in excess of the pressure required to support the weight of the drawing board and its associated parts,

d. a valve associated with said gas spring which is readily accessible so as to permit the introduction to and the removal of gas from said gas spring while said gas spring is in its mounted state within said telescopic column means,

e. said column means comprising a column connected to a base plate and a tube movable within the column and connected with the drawing board proper, characterized in that it comprises a pair of brake shoes located between the column and the tube and acting in the direction towards each other and the tube, which shoes for locking the tube are adapted to move downwardly and inwardly towards the tube so that a self-locking action is effected against further movement of the tube downwards in relation to the column, whereby, after the entire drawing table and the equipment that is to be used thereon have been assembled, the gas which is in excess of that required to support the drawing board and its equipment at the desired height can be discharged.

2. A drawing table according to claim **1** characterized in that it comprises a spring, which upon release of the tube is released and, as the only power source, acts upon the brake shoes for their return movement from the tube.

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