Jan. 7, 1958 G. L. ROCK 2,819,132

CHIROPRACTIC TABLE WITH ADJUSTABLE AUXILIARY TABLE SECTION

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Fig. 1.

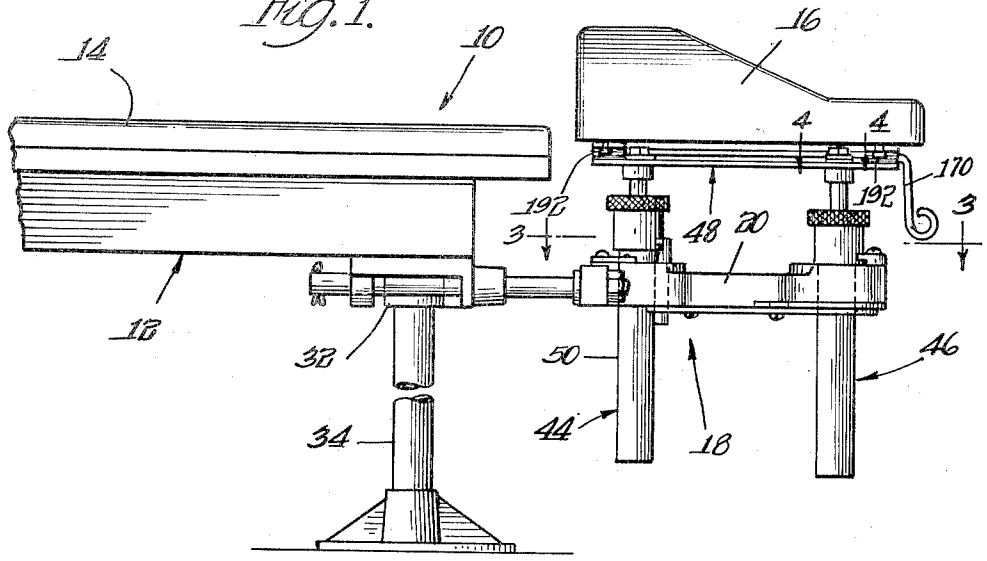


Fig. 2.

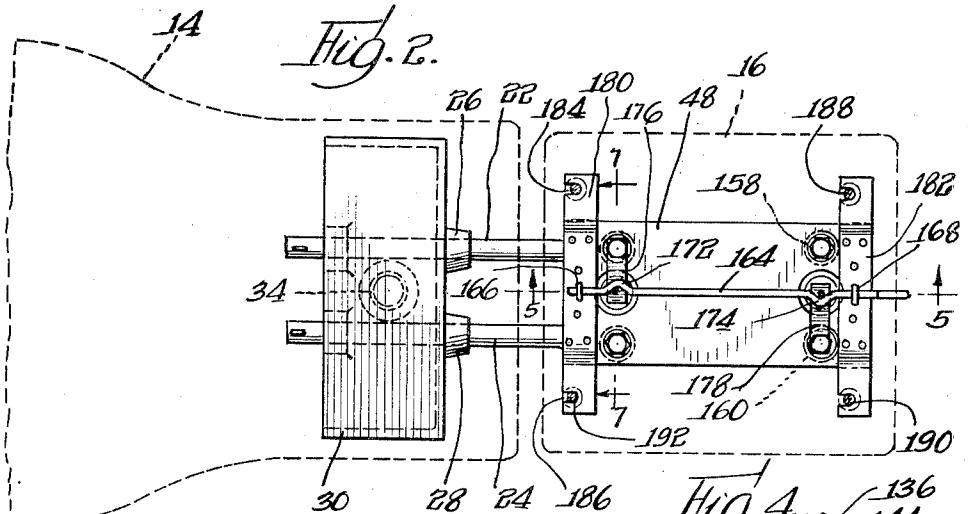


Fig. 4.

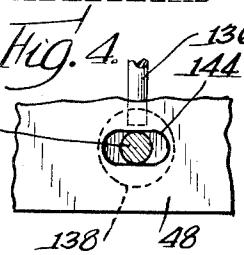


Fig. 3.

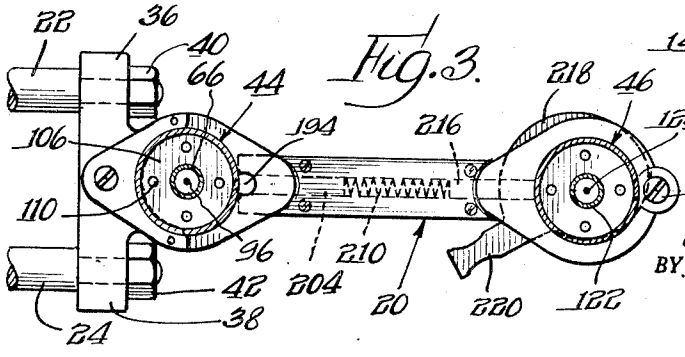


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Fig. 5.

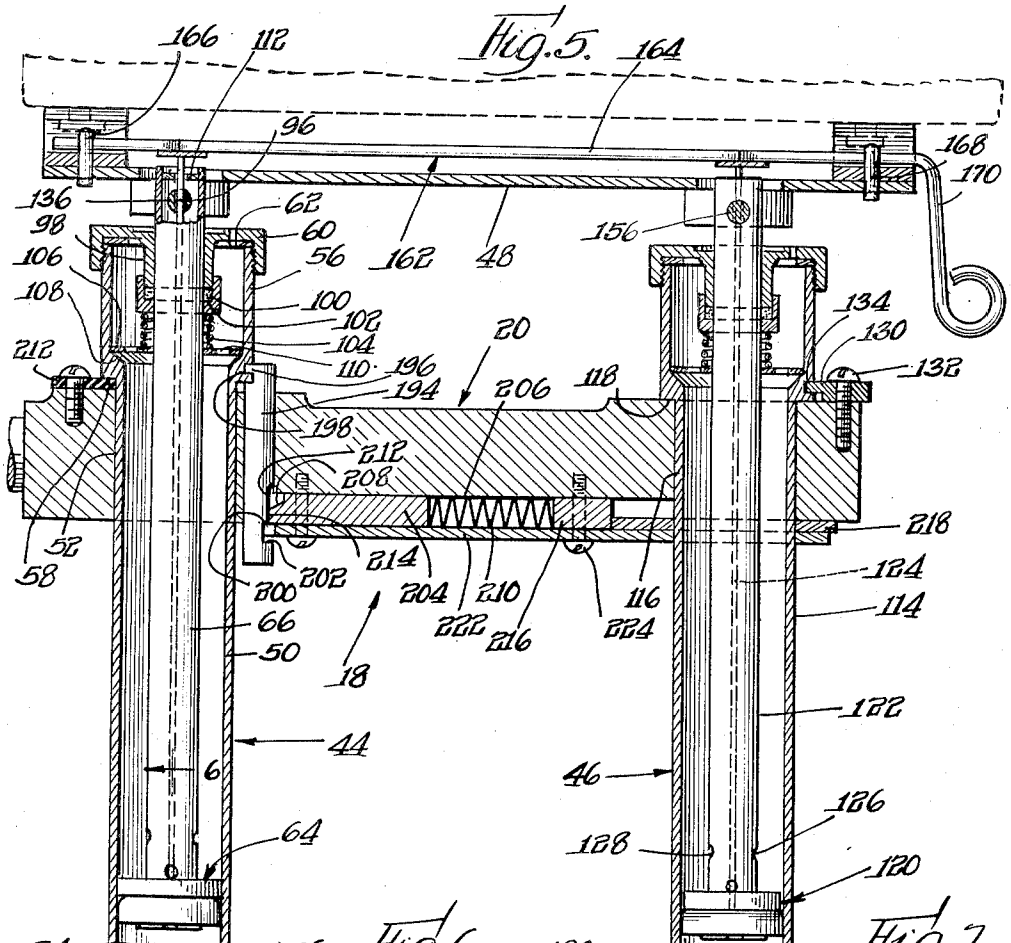



Fig. 6.

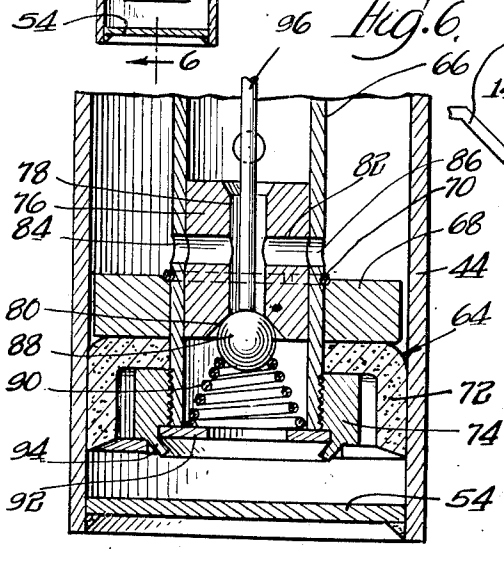
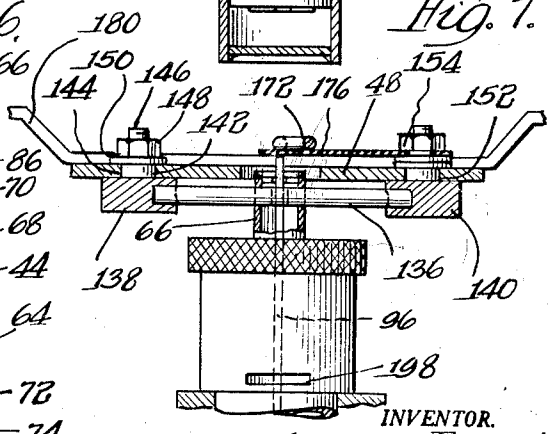



Fig. 7.

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# CHIROPRACTIC TABLE WITH ADJUSTABLE AUXILIARY TABLE SECTION

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Application September 7, 1955, Serial No. 532,881

6 Claims. (Cl. 311—10)

The present invention relates to a novel chiropractic table structure, and more particularly to a novel structure for yieldably and adjustably supporting a section such as a headrest for use in chiropractic tables, benches, and the like.

In my application Serial No. 366,949, filed July 9, 1953, now Patent No. 2,753,233, July 3, 1956, there was disclosed an adjustable headrest supporting structure including a pair of hydraulic cylinders mounted on a cantilever bar and pistons slidably disposed in the cylinders and connected to a headrest mounting member. In my application Serial No. 366,943, filed July 9, 1953, now Patent No. 2,715,557, August 16, 1955, there was disclosed and claimed a structure for yieldably supporting a headrest so that the headrest would be maintained in an elevated position until a predetermined pressure was applied downwardly thereon by a doctor treating a patient whereupon the headrest would be suddenly released for a short downward movement which would be abruptly arrested so as to facilitate proper treatment of the patient. The present invention relates to an improvement of the structures disclosed in the above mentioned co-pending applications.

An object of the present invention is to provide a novel headrest or table supporting structure of the above described type which is of simplified construction so as to promote easier operation thereof and to facilitate more economical manufacturing thereof.

A more specific object of the present invention is to provide a novel simplified combined structure for mounting a headrest or chiropractic table section for vertical adjustment and for mounting the table section for sudden downward movement only after a doctor has applied a predetermined pressure to a patient resting thereon.

A further object of the present invention is to provide a simplified relatively easily operable mechanism for retaining a headrest or table section at an elevated position and releasing the table section for downward movement only after the application of a predetermined pressure thereto, which mechanism may be easily adjusted to vary the pressure at which it will release the table section for downward movement.

A further specific object of the present invention is to provide a novel simplified and economical hydraulic structure for vertically adjustably supporting a headrest or chiropractic table section.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

Fig. 1 is a fragmentary elevational view showing a chiropractic table embodying the novel features of the present invention;

Fig. 2 is a plan view of the novel structure of this invention with a chiropractic table top and a headrest pad shown in broken lines superimposed thereon;

Fig. 3 is an enlarged fragmentary sectional view taken along line 3—3 in Fig. 1;

Fig. 4 is an enlarged fragmentary plan view showing



in greater detail a portion of the connecting structure between one of the piston rods and a headrest pad supporting member;

Fig. 5 is an enlarged sectional view taken along line 5—5 in Fig. 2;

Fig. 6 is an enlarged fragmentary sectional view taken along line 6—6 in Fig. 5; and

Fig. 7 is an enlarged fragmentary sectional view taken along line 7—7 in Fig. 2.

Referring now more specifically to the drawings wherein like parts are designated by the same numerals throughout the various figures, a chiropractic table **10** embodying the principles of this invention includes a main frame **12**, a main top portion **14** on the frame **12**, a detachable padded headrest **16**, and means **18** for mounting the headrest. The headrest mounting means has an auxiliary frame member or bar **20** connected to frame members or rods **22** and **24** which, in turn, are slidably disposed in bearings **26** and **28** in a casting or mounting block **30**. The block **30** is secured to the main frame **12** and has a threaded socket **32** for receiving the upper end of a leg member **34**. As shown in Fig. 3 the rods **22** and **24** have reduced diameter end portions extending through apertures in flanges **36** and **38** on the frame member or bar **20**, and nut members **40** and **42** are threaded onto the ends of the bars to prevent axial separation of the frame member **20**. Since the bars or rods **22** and **24** are slidably disposed in the mounting block bearings, the headrest may be easily adjusted longitudinally of the main portion of the table merely by pushing or pulling it to the desired position. It has been found that the frictional resistance between the rods and the bearings, particularly when a patient is lying on the headrest is sufficient to prevent the headrest from shifting out of the desired adjusted position.

The headrest member **16** is mounted on the auxiliary frame member **20** for vertical adjustment by means of a pair of hydraulic units **44** and **46** connected at their upper ends to a supporting plate **48**. The unit **44** comprises a thin walled hydraulic cylinder **50** which is slidably disposed in an aperture **52** in the frame member **20** and has a sealed lower end **54**. The upper end of the cylinder **50** merges with a larger cylinder **56** and an annular shoulder **58** is provided at the junction of the cylinders for limiting downward movement of the cylinders with respect to the frame member or bar **20**. The upper end of the hydraulic cylinder is closed by a cap member **60** having a vent aperture **62** therein. As shown best in Figs. 5 and 6 a piston assembly **64** is mounted on the lower end of a piston rod **66** and is slidably disposed within the cylinder **50**. The piston assembly includes a metal washer **68** which is slipped over the lower end of the rod **66** and abuts against a snap ring **70** seated in a groove in the rod. A leather washer **72** is held against the metal washer **68** by a member **74** assembled with the lower end of the rod.

The piston rod **66** is in the form of a thin walled tube and a valve body member **76** is inserted into the tube in the manner shown with a force fit. The body member has an axially extending passageway **78** therethrough which merges with a valve seat **80** at its lower end, and a transversely extending passageway **82**. The passageway **82** intersects the passageway **78** above the piston assembly and also is in alignment with apertures **84** and **86** in the wall of the tube. A ball valve **88** is resiliently urged against the seat **80** by a coil spring **90** supported by an apertured washer **92**. The washer **92** is held in position by inwardly swaged lugs **94** on the member **74**. With this structure it is seen that the piston will be rigidly supported in any desired adjusted position by the hydraulic fluid trapped in the lower end of the cylinder **44**, and that the piston may be shifted to any desired adjusted position by opening the valve **88** so that the fluid may pass

through the valve member and to or from the upper and lower sides of the piston. When the piston is being raised the valve opens automatically as a result of the reduced pressure created in the lower end of the cylinder, and a push rod 96 which is operated in the manner described below is provided for opening the valve when it is desired to lower the piston. It should be noted that by making the piston rod or tube 66 so that the wall thereof is relatively thin and by providing the push rod 96 with a relatively small diameter, these elements will displace a relatively small volume of hydraulic fluid in the cylinder so that the size of the cylinder may be reduced without reducing the length of vertical adjustment permitted thereby.

The cylinder cap 60 has a depending bearing portion 98 which serves to guide the upper end of the piston rod or tube 66. In order to wipe the hydraulic coil from the piston rod when the piston is raised, a packing 100 formed from suitable material is compressed between the lower end of the bearing 98 and a jacket member 102. A compression spring 104 is provided for urging the jacket and packing upwardly against the bearing 98, which spring is supported by a washer 106 resting on a conical seat 108. The washer 108 has a plurality of apertures 110 spaced thereon to permit the hydraulic fluid to flow therethrough. It will be appreciated that vent aperture 62 serves to permit air to escape from the top of the cylinder while the piston is being raised so that the pressure in the top of the cylinder will not be increased in a manner which would cause the hydraulic fluid to be forced upwardly through the upper end of the piston rod or tube 66. The vent also prevents a vacuum from being created in the upper end of the cylinder when the piston is lowered. The push rod 96 extends upwardly through an aperture in a guide member 112 secured within the upper end of the tube 66, which aperture is sufficiently large to vent the interior of the tube to the atmosphere.

The hydraulic unit 46 is identical to the unit 44 and, therefore, need not be described in detail. It suffices to state that the unit 46 includes a cylinder 114 slidably disposed in an aperture 116 in the frame member 20 and having a shoulder 118 for engaging the frame member and preventing downward movement of the cylinder. A piston assembly 120 is slidably disposed in the cylinder 114 and mounted on the lower end of a tubular piston rod 122. Check valve means is housed within the piston rod 122, and a push rod 124 is provided for opening the valve when it is desired to lower the piston. Relatively large apertures 126 and 128 are provided in the piston rod or tube 122 above the valve means for permitting the hydraulic fluids to flow freely between the interior of the tube and the cylinder. A key member 130 is secured to the frame or bar 20 by a screw 132 and projects into a slot 134 in the cylinder to lock the cylinder in assembled relationship with the frame member.

The upper ends of the piston rods 66 and 122 are connected with the headrest supporting plate member 48 in a manner which permits the pistons to be adjusted vertically relatively to each other so as to tilt the headrest. More specifically, a cross pin 136 extends through and is rigidly fixed to the upper end of the piston rod 66 and has outer ends thereof journalled in bearing members 138 and 140. The bearing member has a stud portion with a smooth section 142 disposed in an elongated slot 144 in the plate member 48, and a threaded reduced diameter section 146 for receiving the nut member 148. Preferably, a washer 150 is disposed between the nut member and the plate member 48. With this arrangement, the bearing member 138 may slide along the slot 144 so as to permit tilting of the plate member 48 without causing binding of the piston rod 66 in the cylinder. The bearing 140 has a similar stud portion extending through an elongated slot 152 in the plate member, and a nut member 154 is applied to this stud portion. A similar cross pin 156 is rigidly connected with the upper end of the



piston rod 124 and is journalled in bearings 158 and 160 slidably connected with the plate member 48 in the same manner as the bearings 138 and 140.

In order to depress the push rods 96 and 124 to open the check valves and thereby lower the headrest, an operating member 162 is mounted on the plate member 48. The operating member has a shank portion 164 journalled in a pair of wire bracket members 166 and 168 and an angularly disposed handle portion 170. In vertical alignment with the push rod 96, the operating member is provided with an offset section 172, and in vertical alignment with the push rod 124 the operating member is provided with an offset section 174. It should be noted that these sections are offset oppositely from each other so that the operating member must be turned in opposite directions to lower the two pistons. Thus, the pistons may be lowered individually whereby the headrest may be easily adjusted to any desired angular position even when a patient is supported thereon. A leaf spring 176 is mounted on the stud portion of the bearing member 140 and projects between the upper end of the push rod 96 and the offset section 172 of the operating member. Upon rotation of the operating member in the proper direction, the section 172 will depress the spring 176 which, in turn, will depress the push rod 96. When the piston has been lowered the desired amount, the operating member is released by the doctor and the spring 176 automatically returns the operating member to a neutral position. Similarly, a leaf spring 178 is mounted on the stud portion of the bearing member 160 and extends between the upper end of the push rod 124 and the offset section 174 of the operating member.

It is frequently desirable to utilize padded headrest members having different contours and, therefore, the headrest member 16 is detachably mounted on the support plate 48. This is accomplished by providing a pair of bracket straps 180 and 182 which may be secured to the support plate 48 by any suitable means. The strap 180 is provided with slots 184 and 186 and the bracket strap 182 is provided with similar slots 188 and 190. Headed pins 192 depend from the bottom of the headrest member 16 and are adapted to be inserted into the slots in the bracket straps to connect the headrest member thereto.

In accordance with a feature of the present invention the structure 18 includes a simplified mechanism for supporting the headrest at one position until a predetermined downward pressure has been applied thereto and then releasing the headrest for sudden downward movement which is abruptly arrested. More specifically, a pin 194 is slidably disposed within an aperture in the frame member 20, as shown best in Fig. 5, which pin has a notched end portion 196 interengaging with a notched portion 198 in the hydraulic cylinder section 56 of the hydraulic unit 44. Thus, the pin 194 and the hydraulic cylinder are connected together for movement as a unit. A lower end portion of the pin is recessed so as to provide a generally downwardly facing inclined cam surface 200 and an upwardly facing shoulder 202. A latch member 204 is slidably disposed within a slot 206 in the frame member 20, which latch member has a cam surface 208 complementary to and adapted to cooperate with the cam surface 200. In Fig. 1 the cylinder 50 is shown in its raised position relative to the frame member 20 and in Fig. 5 this cylinder is shown in its lowermost position. When the cylinder 50 is in the raised position, the latch or locking member 204 enters the recess in the pin 194 and the cam surface 208 engages the cam surface 200 to retain the pin 194 and the cylinder in the raised position. Furthermore, the end of the member 204 engages the shoulder 202 on the pin to limit upward movement of the cylinder relative to the frame member 20. A compression spring 210 is provided for resiliently holding the member 204 in engagement with the pin 194. When a doctor applies a downward pressure to a patient

lying on the headrest with the cylinder **50** in its raised position, the cylinder is retained against downward movement relative to the frame member **20** until a predetermined pressure has been applied whereupon the cam surfaces **200** and **208** function to shift the member **204** to the position shown in Fig. 5 so that the cylinder is released for sudden downward movement. This sudden downward movement is abruptly arrested by engagement of the shoulder **58** with the frame member **20** or, preferably, a silencing pad **212** formed of rubber or any other suitable material is mounted on the frame member for engagement with the shoulder **58**. As is fully set forth in my above mentioned Patent No. 2,715,557, this action insures that the doctor will apply only the correct predetermined amount of pressure to the patient. Furthermore, when the headrest is abruptly stopped at the lower limit of its movement, adjustment of the patient occurs as a result of the applied force or pressure which is in the nature of an impact force. This manner of applying the pressure or force to the patient has been found to be highly beneficial in chiropractic treatments.

In order to raise the headrest and cylinder **50** from the lower position shown in Fig. 5, it is merely necessary for the doctor to exert an upward pull on the headrest. Such upward movement of the headrest is facilitated by providing the pin **194** with a slightly inclined cam surface **212** and by providing the member **204** with a slightly inclined end cam surface **214** so that the member **204** will not unduly bind the pin in its lower position.

The amount of pressure required for proper treatment of various patients will frequently be different, and the mechanism is provided with means whereby the compression of the spring **210** may be easily adjusted so that the latch or locking member **204** will release the pin **194** for downward movement upon the application of different pressures to the headrest. This means includes a slide block **216** abutting the spring **210**, and a cam member **218** pivotally mounted on the cylinder **114**. As shown in Fig. 3, the cam member has an outwardly projecting handle portion **220** which may be easily grasped by a doctor so that the cam member may be rotated. In the position shown in Fig. 3, the cam member is adjusted so that the slide block **216** is shifted the maximum distance toward the left to place the spring **210** under maximum compression. The edge of the cam member is formed so that as the cam member is rotated in a counterclockwise direction as shown in Fig. 3, the slide member **216** shifts toward the right and the compression of the spring is reduced. It will be noted that movement of the cam member is limited to less than 360° since the handle portion **220** will engage the frame member **20**. Thus, the doctor may quickly and easily adjust the pressure at which the headrest will drop between predetermined limits. A plate member **222** is secured to the bottom of the frame member **20** by a plurality of screws **224** for retaining the locking member **204**, the spring **206**, the slide block **216** and the cam member in assembled relationship.

While the preferred embodiment of the present invention has been shown and described herein, it is obvious that many structural details may be changed without departing from the spirit and scope of the appended claims.

The invention is claimed as follows:

1. In an apparatus for use in chiropractic treatment, the combination comprising frame means, a hydraulic cylinder shiftably mounted on said frame means for movement to and from upper and lower positions, means for limiting downward movement of said hydraulic cylinder, piston means adjustably disposed in said hydraulic cylinder, support means carried by said piston means for supporting a portion of the body of a patient, means movable with said hydraulic cylinder and providing a generally downwardly facing cam surface inclined at a relatively large angle with respect to the axis of said hydraulic



cylinder, and a resiliently biased locking member shiftably disposed on said frame means and having a generally upwardly facing cam surface complementary to and engageable with said first mentioned cam surface for locking said hydraulic cylinder in said upper position until a predetermined downward pressure is applied to said support means and for releasing said hydraulic cylinder for sudden downward movement to said lower position when said predetermined pressure is applied to the support means.

2. A combination, as defined in claim 1, wherein said locking member is engageable with a second surface of said means movable with the hydraulic cylinder when the hydraulic cylinder is in said lower position, said second surface being inclined from the axis of said hydraulic cylinder at a relatively small angle so as to facilitate easy movement of the hydraulic cylinder from the lower position to the upper position by an operator.

3. A combination, as defined in claim 1, wherein said means movable with said hydraulic cylinder includes an upwardly facing shoulder, and wherein said locking member is engageable with said shoulder when the cylinder is in said upper position to limit upward movement of the cylinder.

4. In an apparatus for use in chiropractic treatment, the combination comprising frame means, a hydraulic cylinder shiftably mounted on said frame means for movement to and from upper and lower position, piston means adjustably disposed within said hydraulic cylinder, passageway means through said piston means to permit hydraulic fluid to flow from one end of the cylinder to the other end thereof upon adjustment of the piston means along the cylinder, check valve means in said passageway means for preventing hydraulic fluid from flowing from a lower end of the cylinder to an upper end thereof so that the piston means will be supported by hydraulic fluid trapped in the lower end of the cylinder, manual means for opening the check valve means to permit lowering of the piston means, support means carried by said piston means for supporting a portion of the body of a patient, and means for locking said hydraulic cylinder in said upper position until a predetermined downward pressure is applied to said support means and for releasing said hydraulic cylinder for sudden downward movement when said predetermined pressure is applied to the support means.

5. In an apparatus for use in chiropractic treatment, the combination comprising frame means, an upright hydraulic cylinder shiftably mounted on said frame means for movement to and from upper and lower positions, a second upright hydraulic cylinder mounted on said frame means and spaced from said first mentioned hydraulic cylinder, a pair of pistons respectively adjustably disposed in said first and second mentioned hydraulic cylinders, a pair of piston rods respectively connected with said pistons and projecting upwardly beyond said hydraulic cylinders, support means for supporting a portion of the body of a patient, means pivotally and shiftably connecting said support means to one of said piston rods, means pivotally connecting said support means to the other of said piston rods, whereby said support means is mounted for vertical and tilting adjustment, means for limiting downward movement of said first mentioned hydraulic cylinder with respect to said frame means, and means for locking said first mentioned cylinder in said upper position until a predetermined downward pressure is applied to said support means and for releasing said first mentioned hydraulic cylinder for sudden downward movement when said predetermined pressure is applied to said support means.

6. A combination, as defined in claim 5, wherein said locking and releasing means includes a locking member slidably disposed in the slot in the frame means between said hydraulic cylinders, spring means disposed in said slot and yieldably biasing said locking member toward a

cylinder locking position, and a cam member pivotally mounted on said second hydraulic cylinder and operable upon rotation thereof to vary the force applied by the spring means to said locking member so as to change the predetermined pressure required to be applied to the support means to cause movement of said first mentioned hydraulic cylinder from its upper position to the lower position.

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