

May 8, 1962

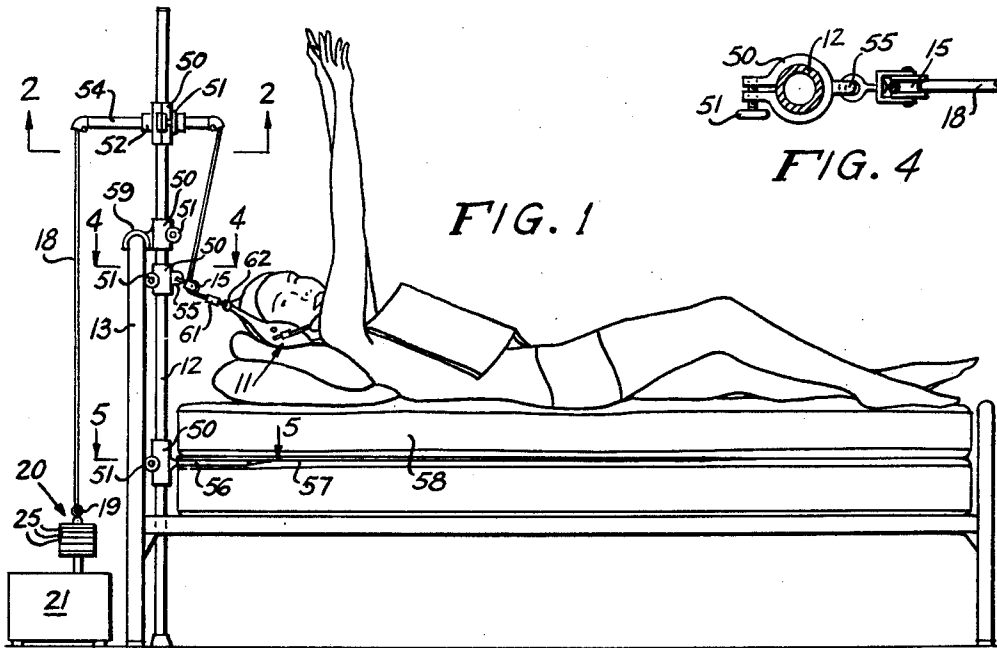
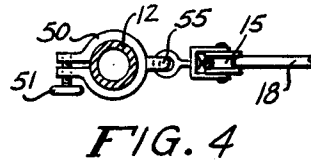
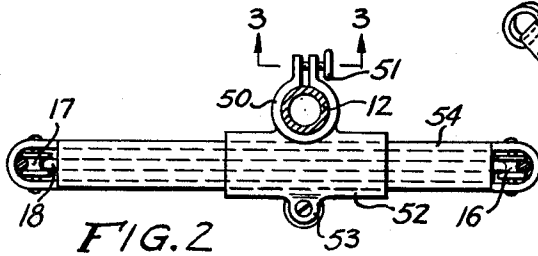
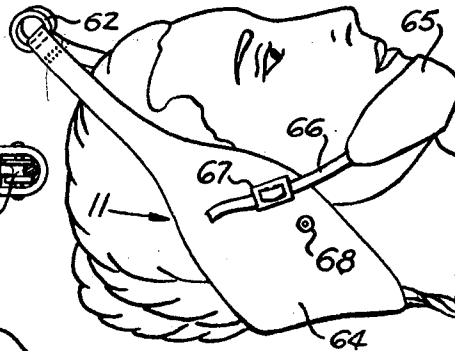
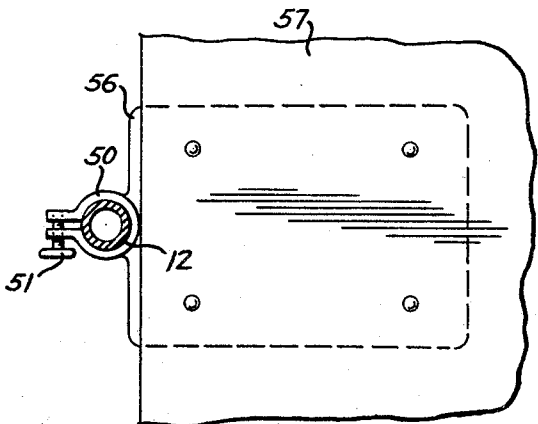
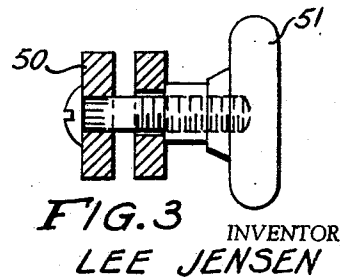
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3,033,198

CERVICAL TRACTION DEVICE

Filed Oct. 8, 1957

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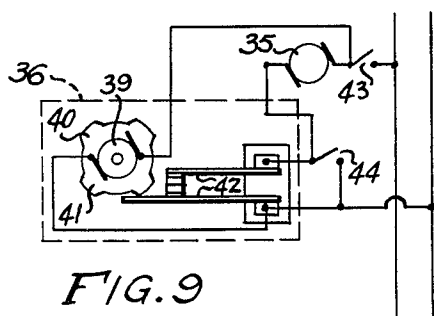
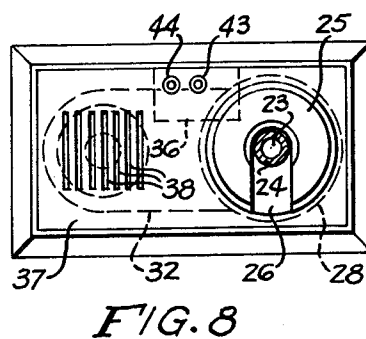
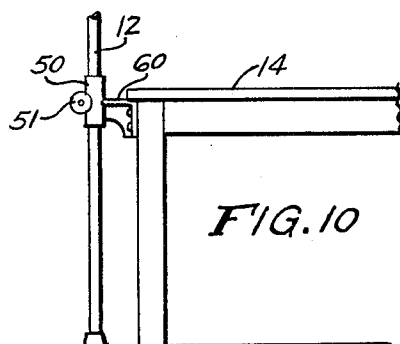
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FIG. 11

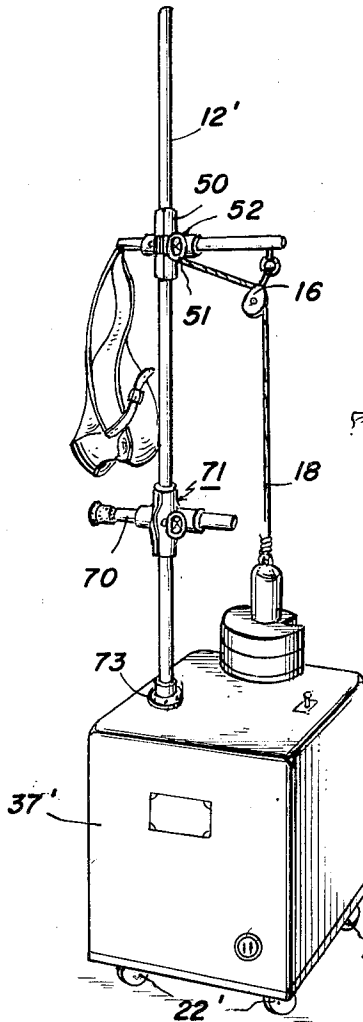


FIG. 12

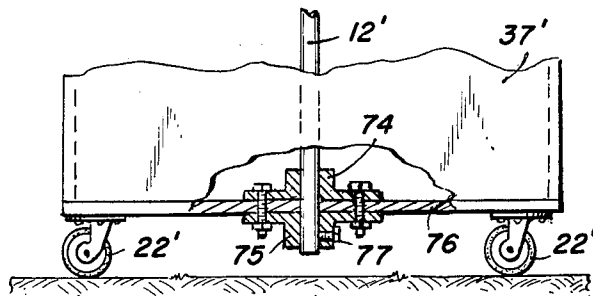
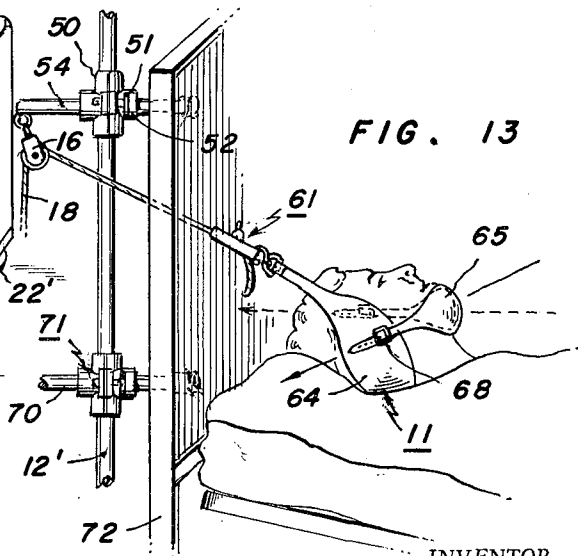


FIG. 13



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CERVICAL TRACTION DEVICE

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9 Claims. (Cl. 123-75)

This invention relates to cervical traction apparatus for use in treatment of patients with displaced cervical discs, whip-lash, osteo-arthritis, narrowed spaces, shoulder syndromes, headaches, subluxations and other tension states.

The main object of the present invention is to provide intermittent traction on the cervical spine by means of apparatus in which the force of traction may be adjusted and maintained at such adjusted value regardless of minor changes in the position of the patient.

A further object is to apply this traction force to the head of the patient by means of a head halter attached to a line passed over suitable pulleys and having a weight platform hung on its other end adaptable to receive weights adding up to the required value of the traction force, and to automatically raise the weight platform with its weights by means of a timed lifter for intermittently relieving said traction force, in accordance with any desired timing cycle.

A further object is to adapt the use of the above apparatus to either a chair, a bed or a table, in or on which the patient may be placed, respectively.

A further object is to provide a motor driven vertical rod to serve as the lifter, and provide the weight platform with a hollow central lug extending upwardly therefrom and closed at the top to form a socket into which the vertical rod is adapted to reciprocate for cyclically raising the platform and relieving the traction force.

A further object is to drive said vertical rod hydraulically on its upward or lifting stroke by means of a piston connected to the lower end of said rod and operating in a cylinder fed with hydraulic fluid forced into the bottom of the cylinder by a pump supplied with said fluid from a reservoir with which the bottom of the cylinder is connected by a restricted vent, and to drive said pump at intervals by means of said motor to raise said weight platform.

A further object is to provide a suitable head halter for the patient having a wide band portion passing under the rear of the head upwardly over the top of the head and an adjustable chin strap detachably attached to selected point on the sides of this band to distribute the traction force to the jaws and the back of the neck, while at the same time the wide band portion and the chin strap mutually prevent each other from slipping off the corresponding head parts.

A further object is to mount the vertical rod and its operating and control means assembled in an enclosure mounted on swivelled rollers, with the upper end of the vertical rod extending upwardly from the top of the enclosure, and an electric cord extending from the casing for plugging into a 110 v.-A.C. power supply line.

A further object is to include in the above portable unit, the rest of the equipment necessary for a complete cervical traction apparatus including the adjustable fitting hangers for the pulleys and harness, and a bumper fixture for setting the unit in position against the table, chair or bed in which the patient is to be treated.

Other and more specific objects will appear in the following detailed description of one form of the present invention, as illustrated in the accompanying drawings, wherein:

FIG. 1 is a general view of the apparatus as applied to a patient lying in bed,

FIG. 2 is an enlarged detail view taken on the line 2-2 of FIG. 1,

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FIG. 3 is a further enlarged detail view taken on the line 3-3 of FIG. 2,

FIG. 4 is an enlarged detail of a pulley fitting mounted on the supporting staff, and taken on the line 4-4 of FIG. 1,

FIG. 5 is an enlarged detail plan view of the platform fitting attached to a mattress board,

FIG. 6 is a side of the novel head band applied to a patient's head,

FIG. 7 is an elevational view in section of the enclosure on rollers and a loaded weight platform,

FIG. 8 is a plan view on a reduced scale taken on the line 8-8 of FIG. 7,

FIG. 9 is a schematic wiring diagram of the pump motor and cycling control,

FIG. 10 is a partial elevational view showing the application of the apparatus to a table on which the patient may be placed for treatment,

FIG. 11 is a perspective view of a modification of the device in which the pulley fixtures and a bumper bracket are made a part of the portable unit,

FIG. 12 is a partial view of the lower portion of this unit, showing the mounting of the upright fixture support in the bottom of the unit, and

FIG. 13 shows the improved form of head halter adjusted for minimum chin strain.

The apparatus of the present invention includes a novel headband 11, an upright pole 12 with adjustable fittings clamped thereon adaptable for attachment to a chair (not shown) a bed frame 13 or a table 14, as the case may require, for supporting pulleys 15 and/or 16 and 17 over which the line 18 from the top of the head band may be passed, down to the ring 19 at the top of the weight holder 20, and the portable cycler 21.

The cycler is mounted on swivelled rollers 22 for easy movement into any desired position where the vertical rod 23 will reciprocate in the guide socket of the hollow central lug 24 extending upwardly from the center of the platform 26 of the weight holder 20. Disc weights 25 of several denominations may be used to make up the desired traction force on the line 18 when the rod 23 is retracted to permit traction to be applied. The lug 24 has a hanger ring 19 at its top to which the line 18 is tied so as to normally support the weight holder off the top of rod 23 when the rod is retracted, but within its reach to fully extended position during reciprocation, whereby the rod 23 will cyclically lift the weight holder to relieve the traction force. Weights 25 are radially slotted to fit around the lug 24, and may be provided with interfitting ridges and grooves on their faces, with a corresponding ridge or groove on the platform, to prevent accidental sliding of the weights off the weight holder.

The cycler comprises a piston 27 fixed to the lower end of the vertical rod 23 and operatively associated with the vertical cylinder 28 to provide a hydraulic chamber 29 in the cylinder below the piston sealed off by the sealing ring 30 on the periphery of the piston. This ring may be of any pliable or somewhat flexible material resiliently held in continuous contact against the cylinder wall.

A pump 31 supplies the hydraulic fluid from the reservoir 32 into the lower end of the cylinder 28 through a conduit 33, and is operated through drive shaft 34 from the electric motor 35. The timer circuit control box 36 may be mounted inside the box casing 37 which is removably fitted over the entire assembly of the cycler, as shown in FIGS. 7 and 8, and has a bore in its top to fit over the rod 23, which is the only exposed part of this assembly. The top of the box casing 37 may be further provided with slots 38 or other openings directly over the motor 35 to dissipate its heat by ventilation.

The timer circuit includes a clock motor 39 for operating a timer cam 40 which may be designed to suit requirements. The form shown has four lobes 41 for maintaining the timer switch 42 open to stop motor 35 for five seconds and closed to operate motor 35 for 10 seconds alternately as long as power is supplied by turning the main control switch 43 to its on position. A by-pass switch 44 is provided for by-passing the timer switch 42 so as to operate the motor 35 continuously, thus maintaining the rod 23 in extended position to keep the traction force relieved.

The switches 43 and 44 may be positioned on the top of the box casing 37 adjacent the control box 36. Switch 43 may be a common toggle switch, and switch 44 may be of the pull chain variety so that its pull chain might be extended to within reach of the patient, whereby he could relieve himself from the traction force when necessary either for temporary relief or until some weight adjustments might be made.

The circuit shown in FIG. 9 is merely schematic and the timer switch might be used to operate a relay instead of carrying the power current itself. Also a number of cams may be provided for selectively replacing cam 40 for providing different timing cycles as may be desired.

The motor 35 is connected by cable 45 to the control box 36 by a plug connection 46 so that the box casing with the control box 36 can be removed for servicing or inspection. The power is supplied from the outside through the cord 47 connected to the control box 36 at 48.

The top of the reservoir 32 may be provided with a filler neck 49, through which the hydraulic fluid may be replenished or drained, or a separate drain plug might be provided in the bottom of the reservoir 32 for easier draining.

The apparatus of the present invention includes a pole 12 with an assortment of fittings for adapting the cyclor for use of the patient seated in a chair or lying in bed or on a table. Each fitting is provided with a clamp portion 50 which may be slid over the pole and fixed thereon in the adjusted position of the fitting by tightening the hand knob 51.

The uppermost fitting is a clamp fitting 52 with clamp screw 53 having a tubular member 54, forming a pulley tree, slidably adjustable therein in a transverse direction alongside the pole 12. Pulleys 16 and 17 are mounted at its ends for carrying the line 18 up from the patient's head side of the pole to the outer side thereof where the weights are hung on the weight holder 20 already described. The normal supply of weights may consist of four 10 lb. discs, one 5 lb. disc, two 2 lb. discs and a 1 lb. disc which will be sufficient to provide all normal traction requirements in increments of 1 lb. up to 50 lbs. The weight holder itself may be made of light metal weighing less than 1 lb.

The other pulley fitting may be simply an eye 55 to which to attach the pulley 15 for guiding the line 18 from the head band 11 in a substantially horizontal direction over the pulley 15 and upwardly to pulley 16. This fitting would obviously not be used in the event the apparatus were applied to a patient sitting in a chair.

The other fittings are for fixing the pole 12 firmly in place on the floor. In the application to a bed, a platform fitting 56 may be attached to a board 57 held under the mattress 58 and another fitting having a hook portion 59 may be clamped over the head of the bed 13, to hold the pole 12 firmly in place.

In the application to a table the platform fitting 56 may be replaced by a bracket fitting 60 for attachment to the end of the table 14 as shown in FIG. 10. In this case the hook fitting 59 would not be necessary.

In all these applications, it should be noted that the patient has freedom of motion to turn his head as well as a limited freedom of change in his longitudinal position relative to the line 18 without altering the traction force

which is determined by the weight supported by the weight holder during the period of the cycle in which the rod 23 is retracted. He may even temporarily move his head far out of position by pulling the line 18 to lift the weight holder way up to the pulley 17 without adding to the traction force, when he wants to reach for something nearby, thus eliminating the necessity of having someone in attendance to reach for him.

The pull chain type of switch 44 furthermore enables him to cause the rod 23 to stay in its uppermost position for as long as he wishes to relieve the traction force, should he require such relief in the absence of an attendant, by having the chain extended to within his reach. By repeating the switch operation, he may again resume the cyclic application of the intermittent traction force treatment.

A latch fitting 61 may be interposed at the end of line 18 attached to his head band ring 62 whereby he may readily change the amount of the line 18 passed through this fitting so as to make further adjustments of the effective length of line 18 so as to stay within the range of the traction stroke upon any extensive change in his longitudinal position relative thereto. Latch fitting 61 may be any type of quick release clamp sleeve means through which the end of the line 18 is passed.

Upon proper adjustment of the line 18, when the main switch 43 is turned on the cyclor unit operates the pump 31 to force the hydraulic fluid from the reservoir 32 into the bottom of cylinder 28 to promptly move rod 23 to its upper or extended position to lift the weight holder 20 and relieve the tractive force, until the next lobe 41 on cam 40 opens switch 42 to break the circuit of motor 35, when the weights 25 force the fluid back through the pump, which normally provides enough leakage back into the reservoir 32 to bring the rod 23 down promptly until the line 18 again takes up the load of the weights. Thus the traction force is again applied until the cam lobe 41 passes the switch 42 and allows the motor 35 to operate again.

It may be found desirable to add the force of a spring 63 placed between the piston 27 and the top of cylinder 28 for facilitating the prompt return of the rod 23 to its lower or retracted position, after the line 18 becomes taut, assuring a complete separation of the rod 23 from the end of the socket in lug 24 to obtain the full traction load of the weight holder on the line 18.

The head band unit 11 is composed of a wide band portion 64 passing around the back of the head and looped together over the top of the head where the ring 62 is provided for attachment to line 18 either directly or through the clamp sleeve 61. A depressed chin sack portion 65 has side straps 66 which are adjustably supported in buckles 67. One or more snap buttons 68 are fixed to the sides of the wide band portion 64, the buckles 67 being provided with snap fittings for selectively snapping each buckle on one of these snap buttons. Thus the wide band portion and the chin sack help to distribute the pressure of the traction force over a wide area and the entire lower head bone structure, and the side straps snapped to the wide band portion, keep the latter snugly in place, preventing any tendency to slip off the back of the head during the intermittent application of the traction forces. This head band is not obstructive to speech because movement of the lower jaw is not impaired due to the location of the snap buttons in proximity to the axis of the lower jaw hinge.

A modification of the portable unit is shown in FIG. 11, in which the upright 12' may be mounted with hanger 54 adjustably mounted thereon by means of the fittings 50, 51, 52 for the pulleys 16 and 17, one of which may be used as shown in FIGS. 11 and 13. A bumper bar 70 adjustably mounted on upright 12' by means of fitting 71 similar to the other clamps such as 50 for the hanger bar 54, may be suitably adjusted to bear against the bed frame 72 as shown in FIG. 13, to firmly set the unit

against movement in response to tension forces on the line 18 during traction operation.

The upright 12' may be supported rigidly in the unit by means of a flange fitting 73 fixed to the top of the box casing 37', and a pair of flange fittings 74 and 75 fixed to the floor 76 of this casing around a corresponding bore therein, through which the lower end of the upright 12' is passed and fixed by a set screw 77. This unit is provided with swivelled rollers 22' at the corners, as in the form previously described, for easy rolling movement into any desired operating position against the table, chair or bed in which the patient is to be treated.

The head halter 11 shown in FIG. 13 is adjusted for less chin strain by applying the chin strap buckles to the lower snaps 68, thus concentrating more of the traction through the back of the head, which may be desirable in some cases. In any event, the traction forces are well distributed over a large area of the back of the head because of the wide head band 64 being well padded, as e.g. by foam rubber or other suitable padding. The chin cup 65 may likewise be provided with suitable padding material to distribute any forces applied through the chin.

The hydraulically operated traction cyler herein described has been found exceptionally smooth and gentle in operation, easily adjustable to provide the required traction force and time interval as may be required in different cases.

The special head halter fits any head size and is connected to the line 18 by an easily adjustable rope tightener 61.

The simplicity of construction of this portable apparatus makes it very easy to build at reasonable cost a unit that is ready for use instantly and adaptable to any situation for cervical traction treatment.

This unit may be similarly used for lumbar or low back traction, by adding more weights and substituting a lumbar belt for the head halter.

Many obvious modifications in the detail structure and arrangement of parts may be made without departing from the spirit and scope of this invention as defined in the appended claims.

What is claimed is:

1. A traction apparatus for cervical traction cases comprising an upright post adapted for fixing close to a traction patient, a pulley bracket mounted on said post and having at least one pulley, a line passed over each pulley, an adjustable headband for the back of the neck of said patient and having a chin strap, said headband being attached to one end of said line, a platform freely suspended on the other end of said line, weights equivalent to the desired tractive force placed on said platform, and motor driven hydraulic means for intermittently lifting said platform to relieve said tractive force, said lifting means being movable directly under said platform, and having a guide post slidable into a sleeve in said platform to prevent spilling said weights.

2. Traction apparatus as defined in claim 1, said lifting means including an automatic cyclic control means for operating said lifting means intermittently.

3. Traction apparatus as defined in claim 2, said automatic cyclic control means including an operating motor, and a control circuit therefor including a breaker switch

and a timer means for intermittently making and breaking said breaker switch for predetermined periods.

4. Traction apparatus as defined in claim 3, said lifting means further including a vertical cylinder and a piston operating therein, a pump operated by said motor for forcing hydraulic fluid into the bottom of said cylinder to raise said piston, and a piston rod fixed to the top of said piston and supporting said guide post for raising said platform, said pump providing sufficient leakage when stopped to assure prompt release of the hydraulic fluid from the cylinder to lower the weight holder in response to the weight of said platforms and weights.

5. Traction apparatus as defined in claim 4, a compression spring mounted on top of said piston for supplementing the downward force of said weight on the piston rod and to assure positive withdrawal of said piston rod from supporting contact with said weight holder, when the pump is not operated.

6. Traction apparatus as defined in claim 5, said lifting means circuit including a manually operated by-pass switch connected across said breaker switch for disabling said breaker switch control and causing said piston rod to remain in raised position, said by-pass switch being of the pull chain type having a chain long enough to place its end within reach of the patient to whom the apparatus might be applied.

7. A portable traction cyler comprising a casing mounted on swivelled rollers, a post mounted on said casing, at least one pulley adjustably mounted on said post, a halter for attachment to a portion of the patient's body, and fastened to a line passed over each pulley, the other end of said line having a weight platform freely hanging over said casing, a reciprocating lifter post extending from the top of said casing into a socket in the bottom of said weight platform and weights on said platform for providing the proper amount of traction through the halter on the patient, and means in said casing for cyclically reciprocating said lifter post to raise said weight platform and relieve the traction force intermittently for predetermined intervals.

8. A portable traction cyler as defined in claim 7, and an adjustable bumper attached to said pulley supporting post for setting against a rigid portion of the support occupied by the patient, to steady the cyler against movement in response to the application of the traction forces during treatment.

9. A portable traction cyler as defined in claim 8, said halter being a head halter for use in cervical treatments.

References Cited in the file of this patent

UNITED STATES PATENTS

1,783,080	Gimenez	Nov. 25, 1930
2,633,125	Yellin	Mar. 31, 1953
2,665,685	Kaufman	Jan. 12, 1954
2,740,399	Judovich	Apr. 3, 1956
2,773,499	Zur Nieden	Dec. 11, 1956
2,796,061	Miller	June 18, 1957
2,803,245	Judovich	Aug. 20, 1957
2,811,965	Richards	Nov. 5, 1957
2,813,527	Cook	Nov. 19, 1957
2,837,085	Tong	June 3, 1958
2,910,061	Rabjohn	Oct. 27, 1959