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CONTROL APPARATUS FOR DENTAL CHAIR

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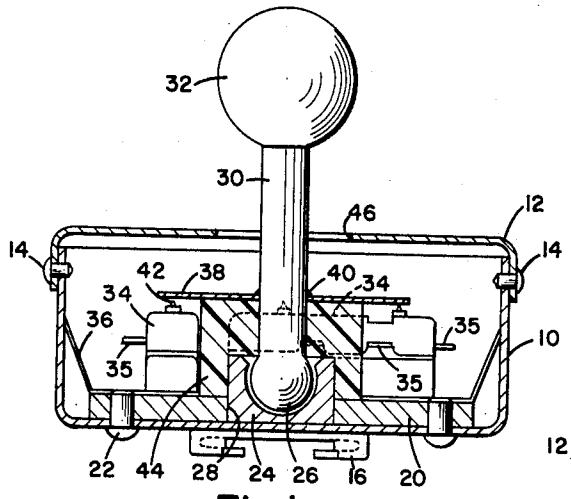


Fig. 1

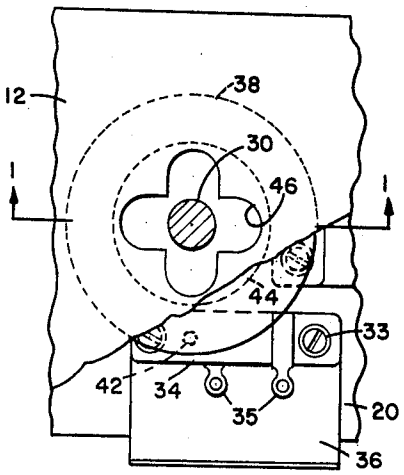


Fig. 2

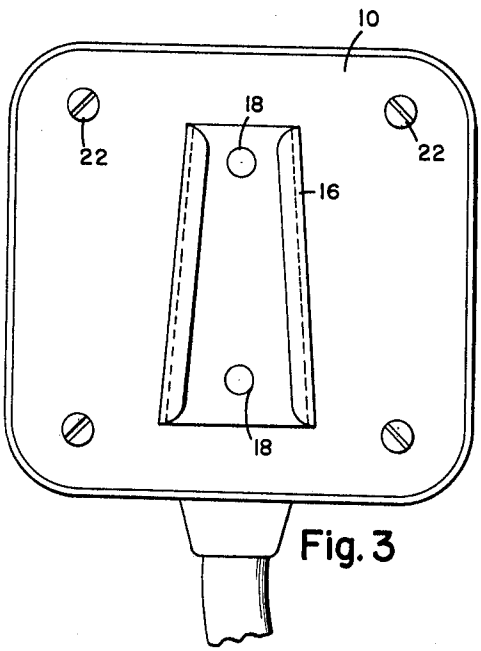


Fig. 3

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CONTROL APPARATUS FOR DENTAL CHAIR

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This invention relates to hand control apparatus and more particularly to a single manual controlled lever for controlling a plurality of functions of medical equipment. In the dental and medical equipment field, as is true of many other fields, substantially universal adjustment of apparatus is sought, including electrical, pneumatic and hydraulic adjustments.

During the evolution of various equipment in the medical and dental fields, including apparatus for accomplishing the desired substantially universal adjustment, controls have been devised whereby separate manual controls have been provided for each of the various adjustments. This has been acomplished by a plurality of either foot or hand operated control levers.

I have invented control apparatus having only a single lever for manual control of a plurality of pneumatic, hydraulic, electrical or other control apparatus thereby accomplishing the desired universal adjustment of equipment by a single lever.

It is a significant object of my invention to provide a single source for controlling substantially universal adjustment of power operated apparatus.

It is a further significant object of my invention to provide a single manual controllable lever adapted for controlling a plurality of power sources.

Another object of my invention is to provide an improved and simplified apparatus for controlling power controlled apparatus.

A further object of my invention is to provide a single manual control of the nature described above which is simple, positive and efficient in operation and relatively inexpensive to manufacture.

Other objects and advantages of my invention will be particularly set forth in the claims and will be apparent from the following description of one embodiment of my invention taken in connection with the acompanying drawings.

In the drawings:

FIG. 1 is a cross-sectional view of one embodiment of my invention taken along the line 1—1 of FIG. 2 looking in the direction indicated by the arrows;

FIG. 2 is a top planar view of the embodiment of my invention illustrated in FIG. 1 with the control lever shown in section; and

FIG. 3 is a bottom planar elevation of the embodiment of my invention illustrated in FIG. 1.

Referring to FIG. 1, I have illustrated a control box comprising a bottom **10** and a mating top **12** secured thereto by suitable means such as by screws or pins **14**.

On the exterior surface of the bottom **10** I have provided a hangar or clip **16** attached thereto as for example by rivets **18**. Clip **16** is adapted for mating with a bracket attached to the dental or medical equipment or other apparatus which my invention is adapted to control or attached to any convenient object. It therefore will be understood that my invention is removably mountable with respect to the equipment with which it is to be used, the wall adjacent the equipment with which it is to be used, or any other object convenient to the equipment being controlled.

A support member **20** is rigidly secured to the bottom **10** by means of a plurality of spaced screws **22**. In the illustrated embodiment, I provide a ball joint comprising a female part **24** and a male part **26**. Male part **26** is

pivotal in female part **24** and female part **24** is rigidly mounted within an opening **28** in the center of support member **20**.

Male part **26** is integral with a control lever **30** having a knob **32** threaded onto the opposite end thereof.

It will be understood that my invention contemplates any substantially universally pivotal connection between the lever **30** and the bottom **10** of the control box. Therefore, any other type of pivotal connection could be provided in lieu of the ball joint illustrated by the parts **24** and **26**.

A plurality of switches **34** rigidly connected to support member **20** in spaced relation surround the lever **30**. Each of the control switches **34** is mounted on a spacer **36** in turn rigidly mounted on support member **20** by bolts **33** extending through the switch **34**, spacer **36** and member **20**. Although in this particular case, switches **34** are control switches, each having two electrical contact points **35**, it will be understood that these control switches could, within the contemplation of my invention, be supplanted by pneumatic, solenoid or other type of valves.

I have provided a circular contact disc **38** rigidly connected through its center to lever **30** by, for example, a weld **40**. Contact disc **38** is spaced from each of the control nipples **42** of switches **34**, when the lever is to the neutral vertically disposed position illustrated in FIG. 1.

Illustrated at **44** is a resilient collar of rubber or other plastic material or conceivably a spring. Resilient collar **44** engages contact disc **38** in opposition to any pivotal movement of the lever **30** and is positioned intermediate the lever **30** and the plurality of switches **34**, thereby providing an arrangement for maintaining disc **38** in the neutral position illustrated in FIG. 1 except when pressure is applied to the knob **32**.

Top **12** of the control box has an opening **46**, the configuration of which is illustrated in FIG. 2. For this particular embodiment I have illustrated a substantially cross-shaped opening **46** permitting movement of the lever **30** in any one of four directions from the neutral position illustrated in FIGS. 1 and 2, thereby actuating selectively, one of the four switches **34** when disc **38** is brought into contact with the nipple of the selected switch.

Although I have, in the drawings, illustrated four switches controlling four functions of apparatus (not illustrated), it will be understood that with minor modifications in the arrangement and selection of parts, the number of control switches could be varied; the configuration of the opening **46** would merely be modified to correspond to the number and positions of control switches **34**.

Thus, I have provided a very simple single control mechanism whereby a plurality of switches, valves or other control apparatus may selectively be controlled.

While I have shown and described the preferred form of mechanism of my invention, it will be apparent that various modifications and changes may be made therein, particularly in the form and relation of parts, without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. Control apparatus comprising, in combination, a removably mountable control box, a plurality of control means mounted within and on the bottom of said box and spaced from each other, a shaft having a neutral position and being mounted for substantially universal movement about a pivot point on an axis centrally located with respect to said plurality of control means, said axis being substantially equally radially spaced from each of said control means, a contact disc mounted on said shaft, and resilient means between said contact disc and box nor-

mally maintaining said shaft in said neutral position and permitting said disc to actuate at least one of said control means only when a selected force is applied to said shaft.

2. Apparatus in accordance with claim 1 including a top to said box having slots radially extending from the neutral position of said shaft to selected positions permitting said shaft to engage at least one of said control means in each selected position.

3. Control apparatus comprising, in combination, a removably mountable control box, a plurality of control means mounted in said box and spaced from each other on the bottom of said box, a shaft pivotally mounted in said box for substantial universal movement at a position substantially equally radially spaced from each of said control means, said shaft having a neutral position in which the longitudinal axis of said shaft is substantially perpendicular to said plane, a contact disc mounted on said shaft and spaced from said control means when said shaft is in its neutral position, resilient means intermediate said disc and said control box bottom normally maintaining said shaft in said neutral position and permitting said disc to actuate at least one of said control means when pressure is applied to said shaft in opposition to said resilient means.

4. Apparatus in accordance with claim 3 in which said resilient means comprises a plastic ring intermediate said disc and said control box and surrounding said shaft.

5. Apparatus in accordance with claim 3 in which said resilient means comprises a resilient ring intermediate said disc and pivotal mounting of said shaft in said box.

6. Control apparatus comprising in combination: a removably mountable control box; a plurality of control means mounted on the bottom of said box being horizontally spaced from each other; a shaft having a neutral position and being mounted in said box for substantially universal movement about a pivot point on a vertical axis between said control means; substantially horizontally extending means carried on said shaft for actuating one or more of said control means; and resilient means between said horizontally extending means and said box for normally maintaining said shaft in said neutral position and yieldingly permitting said horizontally extending means to actuate at least one of said control means only when a selected force is applied to said shaft.

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