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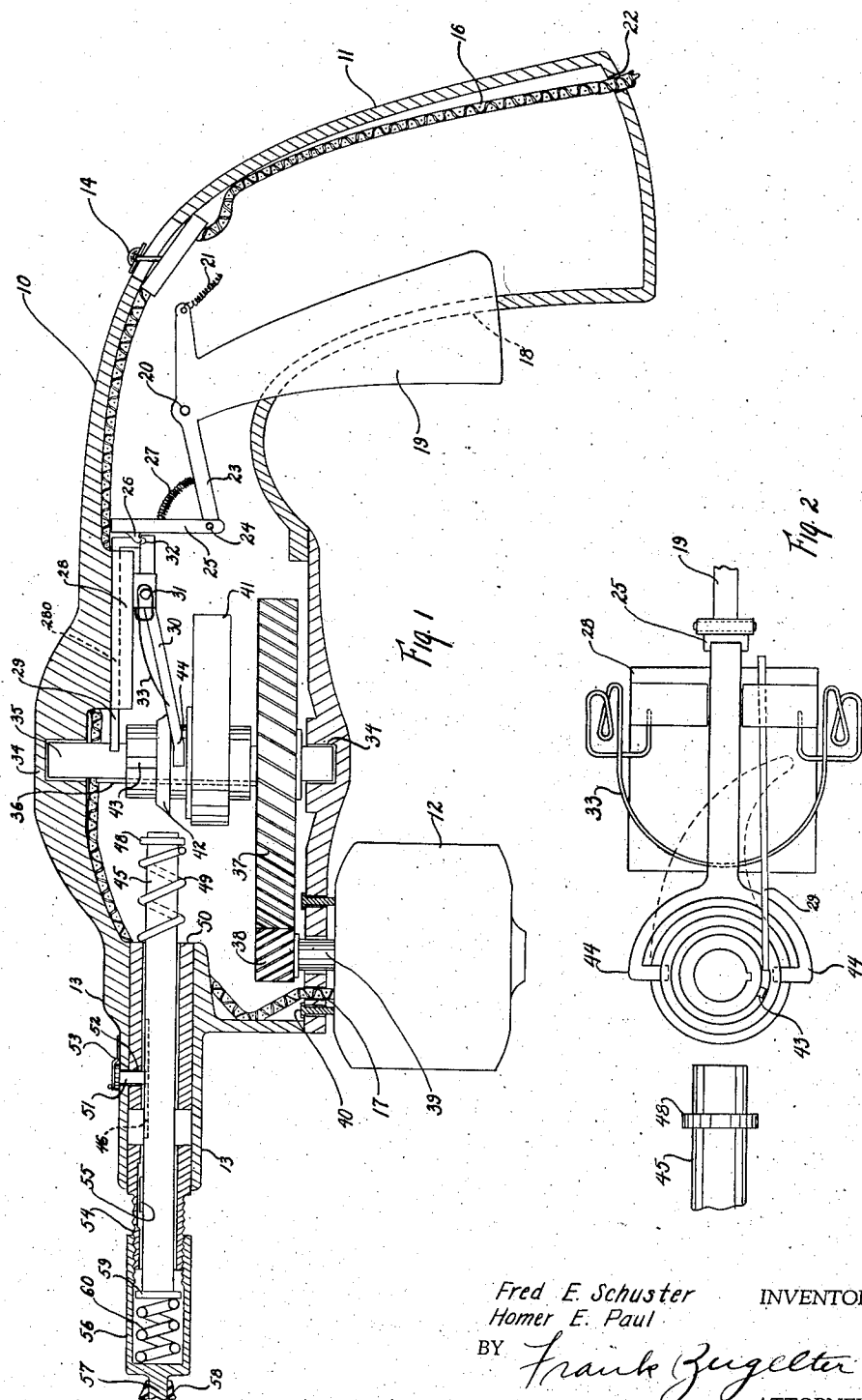
F. E. SCHUSTER ET AL

2,204,259

SPINAL ADJUSTMENT DEVICE

Filed July 22, 1937

2 Sheets-Sheet 1



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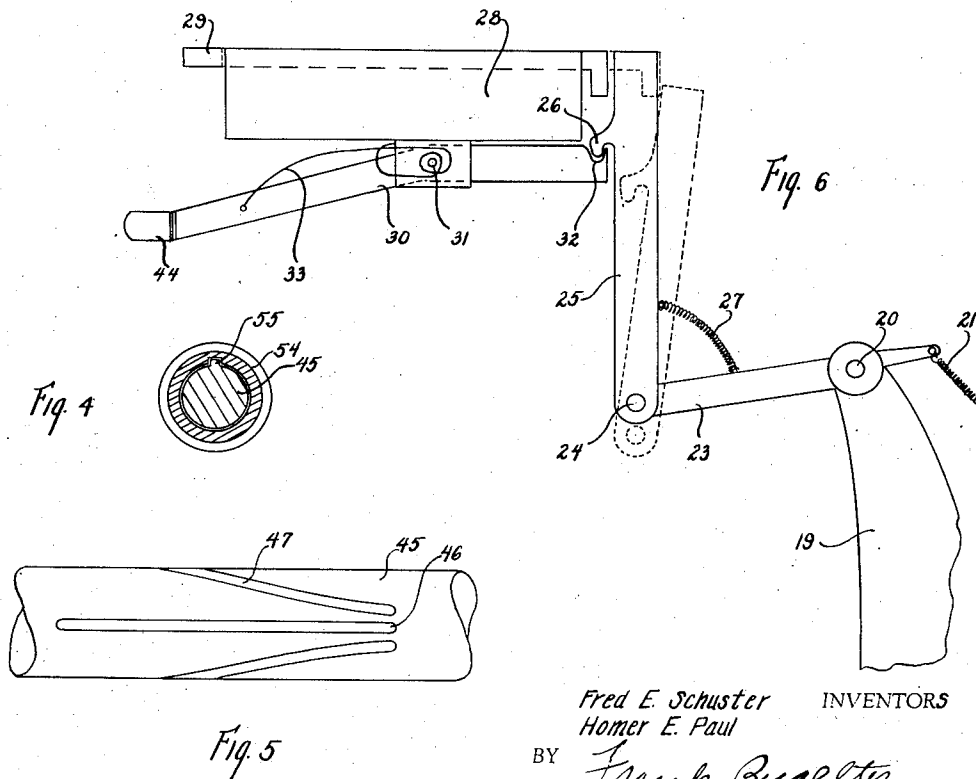
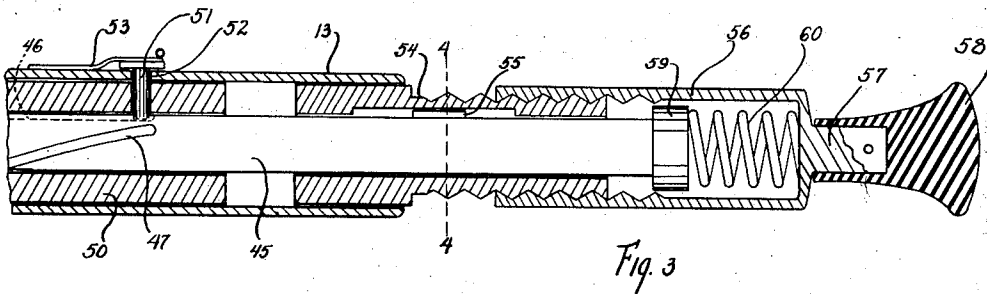
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SPINAL ADJUSTMENT DEVICE

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3 Claims. (Cl. 128—69)

This invention relates to vertebral adjusters and more particularly to an appliance designed for use by chiropractors in adjusting subluxations of the vertebrae by manual application to a patient by the practitioner.

The principal object of our invention is to provide an electrically driven vertebral adjuster having adjustable means therein to control the amount of force used in making vertebral adjustments.

Another object of our invention is to provide a vertebral adjuster having a trigger-actuated means therein for controlling the impact of force to be delivered against the vertebrae of a patient.

A further object of our invention is to provide a vertebral adjuster having superior driving, controlling, and impact means therein for the adjustment of vertebrae.

These and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view showing in elevation a device embodying the invention and showing details of the working mechanism thereof.

Fig. 2 is a top plan elevation of the cam lifter mechanism, forming a detail of the invention.

Fig. 3 is an enlarged cross-sectional view of parts shown in Fig. 1.

Fig. 4 is an enlarged cross-sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a plan view of a section of the shaft showing the torque imparting grooves therein.

Fig. 6 is a side elevation showing the relation between the trigger and cam lifting mechanism.

Our appliance comprises a hollow housing 10, with a pistol grip handle 11 formed integral therewith and set at a convenient angle thereto. A motor 12 is mounted beneath housing 10, and a nozzle 13 extends forwardly from housing 10 and is formed integral therewith.

On the upper surface of the grip 11, an electrical switch 14 may be attached by any suitable means such as screws not shown and an electrical conductor 16 is attached to the switch 14 and extends into the housing 10 and passes through an aperture 17 in the base of housing 10 and is connected to the motor 12. The conductor 16 enters the grip 11 through an aperture 22 in the base thereof.

In the lower surface of the grip 11, an opening 18 is provided for the reception of a trigger lever 19 which may be pivoted to the grip 11 by means of a pin 20 extending through grip 11. Attached to the rear portion of trigger 19 is a tension spring 21. The one end of the spring is fixed relative to the interior surface of the grip, and normally urges the trigger 19 outward from the pistol grip.

Pivotally attached to an arm 23 of trigger 19

by means of a pin 24, is a latch member 25 having a lug 26 at the upper portion thereof. A compression spring 27 is attached to the latch member 25 and to the arm 23 of trigger lever 19 and normally urges the latch member 25 to a forward position.

An offset plate 28 is attached to the interior surface of housing 10 by any suitable means. A channel 280 is provided in plate 28 through which a release pin 29 extends and projects therefrom. Pivotally attached to the middle of plate 28 is a cam lifter lever arm 30 which is pivoted thereto by means of a pin 31. The cam lifter extends rearwardly and has a notch 32 at its upper rear end which is adapted to engage with the lug 26 of latch member 25 when the latch member is moved into a forward position. A spring 33 is attached to the cam lifter 30 and to the offset plate 28 and normally urges the cam lifter downwardly from the offset plate.

In the middle of housing 10, a plurality of bearings 34 are provided respectively in the inner surfaces of the upper and lower portions of housing 10. A drive shaft 35 having a key 36 thereon is rotatably mounted in bearings 34. Rotatably mounted on the lower portion of shaft 35 is a slotted gear 37 which is driven by the gear 38 on the end of a shaft 39 extending upward from motor 12 which is secured to housing 10 by means of screws 40 extending through the base of housing 10 and into the motor housing 12. Rotatably mounted above the gear 37 is a cam 41 having an upwardly extending collar 42 and a release lug 43 integrally formed therewith. The central bore of cam 41 has a keyway extending therethrough which slidably engages with the key 36 on drive shaft 35. Slidably engaging in the collar 42 of cam 41 are the two arms 44 of cam lifter lever 30 whose connection with the actuating trigger 19 has been previously set forth.

Within the nozzle 13 is a slidably mounted impact shaft 45 having a longitudinal groove 46 on the periphery thereof and an oblique or spiral groove 47 extending substantially lengthwise of the impact shaft 45 but inclining in opposite directions from the groove 46. Affixed to impact shaft 45 near its rear end is a collar 48 while a spring 49 surrounds the shaft 45 and abuts against collar 48 and the end of a bearing or bushing 50 within nozzle 13, and the spring urges the shaft in a rearward direction.

A pin 51 passes through an aperture 52 in nozzle 13 and is held therein by means of a spring member 53 which is attached to the nozzle 13 by any suitable means. The pin 51 extends into the groove 46 or the pin may be set in the oblique grooves 47 thereby imparting a right or left hand torque to the impact shaft 45 when the appliance is operated.

A sleeve 54, one end of which is exteriorly screw

threaded, is keyed to impact shaft 45, by key 55, and is slidably movable therewith and one end of the sleeve 54 may be inserted into the nozzle 13 and it extends forwardly therefrom. In screw-threaded engagement with sleeve 54, is an interiorly screw-threaded housing tip 56 having a nipple 57 upon its closed end. A rubber tip 58 may be attached to the nipple 57 by any suitable means. Upon the forward end of impact shaft 45 and affixed thereto is a collar 59 which is adapted to bear against a spring 60 which is placed within housing 56 and is positioned between the collar 59 and the interior of the head of the tip housing 56. The relative position of housing tip 56 upon sleeve 54, controls the degree of compression of spring 60 and thus the relative force with which rubber tip 58 operates on a patient's vertebrae may be controlled. To lessen the force of operation of tip 58 the tip housing 56 should be positioned so that it is only in engagement with several of the threads on sleeve 54. On the other hand, when it is desired to increase the impact of tip 58, the tip housing 56 should be screwed well down onto sleeve 54 whereby spring 60 is compressed so that less of the impact of impact drive shaft 45 will be absorbed.

In operating our improved vertebral adjuster, the rubber tip 58 is placed against the patient's vertebrae. The operator then closes switch 14 thus starting the motor 12 and causing shaft 39, gears 37 and 38, shaft 35 and cam 41 to revolve therewith. When it is desired to actuate tip 58 in order to adjust a patient's vertebrae, the trigger 19 is pushed in thereby causing the latch member 25 to move forward and the lug 26 thereon to dog or engage with the notch 32 on cam lifter lever 30 and depressing the spring 33 and causing the cam lifter arms 44 to raise the cam 41 on shaft 35 so that the cam will contact the drive shaft 45 thus causing the tip 58 to move outward thereby adjusting the patient's vertebrae. When the shaft 35 has made one revolution, the release lug 43 on cam 41 strikes the release pin 29 in offset plate 28. The release pin is pushed backward by this action against the upper edge of latch member 25 thereby disengaging lug 26 from notch 32 and permitting the cam lifter spring 33 to force the cam 41 downward on shaft 35 so that cam 41 will revolve on shaft 35 below the end of shaft 45. In order to deliver another impact by tip 58 it is necessary for the operator to first release his grip on trigger 19 and permit it to move forward and then push in the trigger 19 again when the next impact of tip 58 is desired thus again initiating the movement of parts as explained above.

Our improved vertebral adjuster provides a device which is light and portable. It is capable of making efficient and thorough vertebral adjustments and by means of the shock absorbing spring in the tip and the means for regulating the compression thereof, it is possible to regulate the degree of force applied to the tip 58. Torque control of tip 58 is obtained by causing pin 51 to register with the proper oblique grooves 57 whereby drive shaft 45 will be turned within housing 13 as it is moved relative to pin 51. Spring 53 retains pin 51 in proper alignment with a selected groove as 47 until such time as a positive force is exerted by an operator to change such a setting.

With the foregoing and other objects in view,

the invention consists in the novel construction, combination and arrangement of parts above described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

What is claimed is:

1. In a vertebral adjusting appliance, a housing having a forwardly extending nozzle and a hand grip portion formed integrally therewith, an impact drive shaft extending through said nozzle, resilient means disposed adjacent each end of said shaft for limiting its travel relative to said housing, a resilient tip operatively associated with one end of said impact shaft, means disposed intermediate of said impact shaft for imparting a torque thereto, impact shaft actuating means disposed rearward of said shaft, said actuating means comprising a motor driven cam slidably mounted on a cam shaft, means for maintaining said cam in a non-engaging relationship with the rear end of said impact shaft, and trigger actuated means for sliding said cam upon its shaft to engage the rear end of said impact shaft and release means for returning said cam back to a non-engaging relationship with said impact shaft after one revolution of said cam, whereby said impact shaft is actuated but once each time said trigger is pulled.

2. In a vertebral adjustment appliance, a housing having a forwardly extending nozzle and a hand grip portion formed integrally therewith, electrical driving means operatively associated with said housing, an impact shaft extending through said nozzle, means disposed adjacent each end of said shaft for limiting its motion relative to said housing, a driven mechanism in said housing operatively associated with and continuously driven by said driving means, a trigger, said trigger operatively associated with said driven mechanism for causing said mechanism to impart one blow per revolution to said impact shaft, release means operatively associated with said driven mechanism whereby only one blow may be imparted to the impact shaft for each movement of said trigger, and a resilient tip associated with the free end of said impact shaft for contacting a patient's vertebrae.

3. In combination with a vertebral adjusting appliance, an adjustable tip member which is capable of being adjusted to impart blows of varying force, which appliance comprises a hollow interiorly threaded tip housing closed at one end, a hollow sleeve in threaded engagement with said tip housing, an impact shaft slidably mounted within said sleeve and extending into said tip housing where it terminates in an annular collar, a shock absorbing spring disposed within said tip housing between said collar and the closed end of said housing whereby the force imparted to said tip housing is proportional to the total force delivered by said impact shaft as modified by the shock absorbing spring, the degree of shock absorbed being adjustable by varying the relationship between said tip housing and its associated sleeve, and a resilient tip being attached to the forward end of said tip housing for contact upon a patient's vertebrae.

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