May 28, 1940. M. J. DRACHMAN ET AL 2,202,195

ADJUSTABLE JOINT

Filed Oct. 10, 1936 2 Sheets-Sheet 1

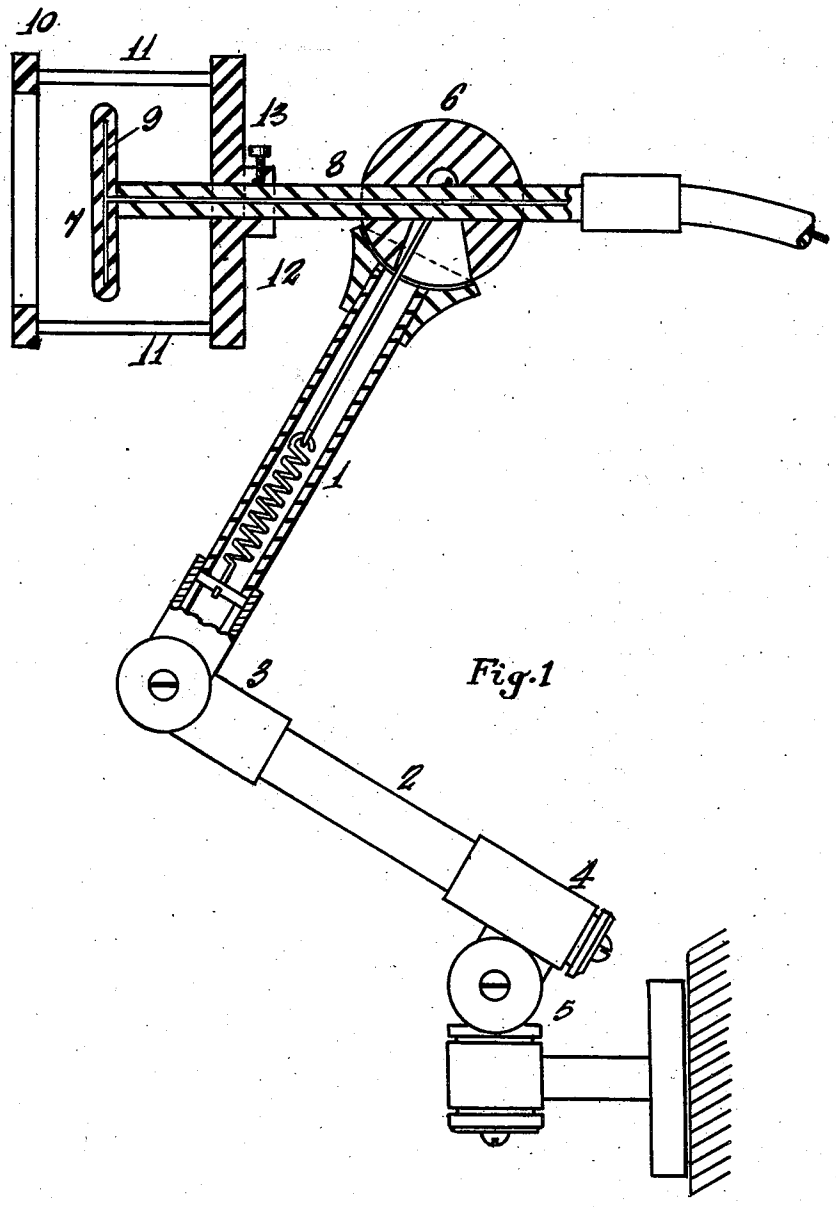


Fig. 1

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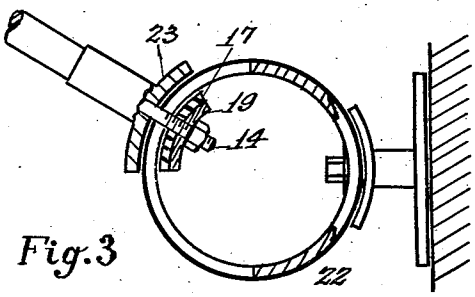


Fig. 3

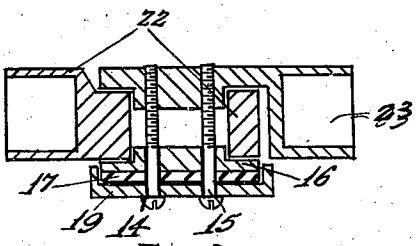


Fig. 2

Fig. 4

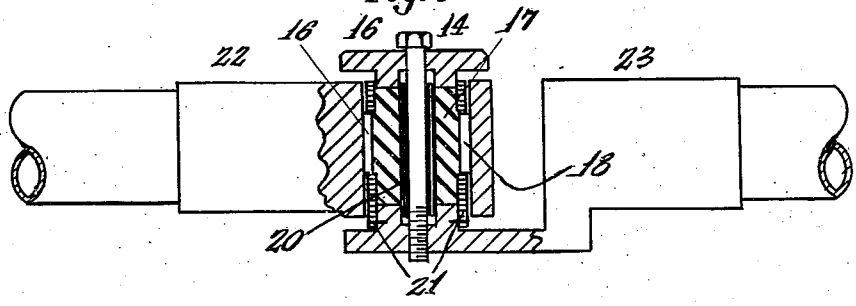
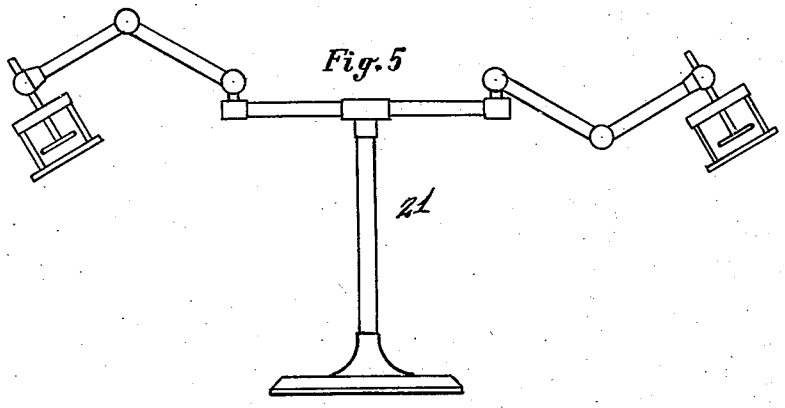


Fig. 5



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Patented May 28, 1940 2,202,195

UNITED STATES PATENT OFFICE

2,202,195

ADJUSTABLE JOINT

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Application October 10, 1936, Serial No. 105,060

7 Claims. (Cl. 287—14)

This invention relates to improvements in electrodes for use in short wave therapeutic treatments. The term short wave is used to designate electrical currents of frequencies from ten million cycles per second and higher as applied to medical treatment or uses. The invention applies particularly to waves of a frequency of thirty million cycles per second or higher corresponding to a wave length of ten meters or less.

More specifically the invention consists of a convenient and practicable means for supporting condenser type short wave electrodes so that these may be readily adjusted to any part under treatment and retained in their proper positions during treatment, in relative security. Another function of the invention is to provide a relatively fixed but adjustable distance of the electrode from the surface of the part being treated, substantially without the interposition of any solid substance, so as to avoid any distortion of the electric field by changing the dielectric values between the patient and condenser electrodes; for this purpose the electrode is provided with a guard, the latter being designed to permit positioning of the condenser electrode in the very plane of the edge of the guard.

The invention is illustrated in the accompanying drawings, showing a preferred embodiment of the invention, in which:

Figure 1 is an assembled view of a supporting arm and the electrode carried thereby, parts of the arm and the electrode being in longitudinal section.

Figure 2 is a view of a joint between relatively movable parts of the supporting arm, the joint being shown in longitudinal section.

Figure 3 shows another type of joint with parts thereof in section. This joint is intended primarily for anchoring the electrode arm to a base of any suitable form, or a wall.

Figure 4 shows another type of joint to be used between relatively movable parts of the electrode arm.

Figure 5 shows a pair of electrode supporting arms mounted upon a pedestal.

In Figure 1 are shown supporting members 1 and 2 provided with frictionally controlled swivels 3, 4, and 5, the extreme swivel having a supporting member or flange which may be secured to a relatively rigid body such as a wall, tripod, base or cabinet. At the other extremity a form of ball and socket universal joint 6 is mounted and permits freedom of motion in any direction to the electrode 7 which is located at the extremity of a hollow dielectric shaft 8 passing through the ball. This shaft contains a conductor through which current passes from the treatment cable originating at the terminal of the short wave generator to the insulated metallic condenser plate 9. The adjustable treatment spacer or guard consists of a ring 10 mounted on extension members 11 and sliding member 12 which may be secured by a locking device 13. If the ring be placed against the surface to be treated and the locking device clamped against the shaft, the electrode will not approach the surface closer than the predetermined relative position.

For the frictionally controlled swivels and joints in the arm, we elect to employ a type unique in the art, three forms of which are illustrated sectionally in Figures 2, 3, and 4. In Figure 2, the swivel elements 22 and 23 contain sockets for securing the shaft of the arm, and circular portions which are clamped together by bolts 14 and 15. Attached to a circular portion of 23 but capable of some relative axial motion is friction plate or means 16 and elastic washer or means 17 which may be of rubber. When the bolts 14 and 15 are tightened, the swivel element 22 is clamped between friction plate 16 and swivel element 23, and compression of the elastic washer 17 causes an easily controllable normal pressure between circular portion of 23, friction plate 16 and circular portion of swivel element 22. This results in a smooth and readily adjustable friction between the two elements of the swivel. A retainer 19 is provided for the elastic washer 17.

In Figure 3, 22 is a smooth ring suitably secured at one end and carrying a vertical slot on the other. Screw 14 passes thru this slot and with its nut secures sliding portion 23 which contains a socket for supporting an arm. 23 is thus permitted a circular motion in the vertical plane of the ring. Screw 14 with its nut further compresses elastic member 17 between retainer 18 and a friction facing thereby causing an easily regulated frictional force between 23 with attached parts and ring 22.

In Figure 4, swivel portions or arms 22 and 23 bear on one another thru cylindrical bushing or shell 21 which fits smoothly within a hollow journal portion of 22. The bushing 21 has one or more apertures in its circumference and between its ends, in each of which is fitted a friction member forming friction means. Two such friction members 16 and 18 are shown in the sectional view of Figure 4, but obviously any suitable number may be provided. Elastic bushing 17 is compressed between washer 19 and a cir-

cular portion of 23 thereby causing friction members 16 and 18 to be pressed outwardly against the inside cylindrical surface of the hollow portion of arm 22. The amount of friction is easily adjusted by means of screw 14. Bushing or tube 20 prevents 17 from pressing against the screw 14 which would tend to cause binding.

In all of designs above the elastic member must be provided with a suitable retainer to prevent expansion or frictional pressure except where needed to cause friction.

In Figure 5, a pair of electrodes, with their supporting arms are swivably mounted on a common support 21.

The invention described herein is intended for use with the short wave therapeutic apparatus shown and claimed in a copending application Serial Number 105,059, filed October 10, 1936.

What we claim as novel and desire to secure by Letters Patent is:

1. An adjustable swivel joint comprising two members one of which is movable relatively to the other, a friction surface upon one member, rubber-like elastic means, and means to completely enclose and confine the rubber-like elastic means including a friction means engaging the friction surface and the rubber-like elastic means, and means to compress the rubber-like elastic means in one direction whereby the friction means is pressed against the friction surface laterally with respect to the direction of compression of the rubber-like elastic means.

2. An adjustable swivel joint comprising two members one of which is movable relatively to the other, one of said members having a bore therein to provide a cylindrical friction surface, a cylindrical shell within the bore and having at least one aperture therein, a friction means within each aperture and engaging the friction surface, a rubber-like elastic means within the shell and engaging the friction means, and means including the other relatively movable member to compress the rubber-like elastic means axially whereby the friction means is pressed radially against the friction surface.

3. An adjustable swivel joint comprising two members one of which is movable relatively to the other, one of said members having a bore therein to provide a cylindrical friction surface, a cylindrical shell within the bore and having at least one aperture therein, a friction means within each aperture and engaging the friction surface, a tubular rubber-like elastic means within the shell and engaging the friction means, a boss upon the other relatively movable member received within one end of the shell and engaging the rubber-like elastic means, a washer having a boss received within the other end of the shell and engaging the rubber-like elastic means, a tube received within the tubular rubber-like elastic means, and a bolt passing through the tube and engaging the second member and the washer to compress axially the rubber-like elastic means between the bosses whereby the friction means is pressed radially and against the friction surface.

4. An adjustable swivel joint comprising a first member having a cylindrical bore therein, a flat friction surface upon opposite faces of the member and adjacent the cylindrical bore, a second member swivable relatively to the first member, friction means engaging each friction surface and having a boss received within the bore, rubber-like elastic means engaging one of the friction means, and means to compress the rubber-like elastic means whereby the friction means are pressed against the friction surfaces.

5. An adjustable swivel joint comprising a first member having a cylindrical bore therein and a flat friction surface upon opposite faces of the member, a second member having a boss swivably received in the bore of the first member and engaging a friction surface, friction means engaging the other friction surface, rubber-like elastic means engaging the friction means, and means including a washer to enclose and compress the rubber-like elastic means whereby the friction means and the second member are pressed against their respective friction surfaces.

6. An adjustable swivel joint comprising two overlapping members one of which is movable relatively to the other, a hole through one of said members, bolt means adjustably carried by one of said members and passing through said hole for adjustably connecting said members together, and elastic rubberlike means carried by and its compression selectively adjusted by said bolt means to operatively vary the friction between said relatively movable members.

7. An adjustable swivel joint comprising two overlapping members one of which is pivotally movable relatively to the other, a cylindrical hole through one of said members, means carried by the other member engaging the hole so that the axis of the hole is the axis of the pivotal movement between the members, bolt means adjustably carried by the next aforesaid means and passing through said cylindrical hole for connecting said members together, and elastic rubberlike means carried by said bolt means and operative to vary the friction between said relatively movable members.

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