

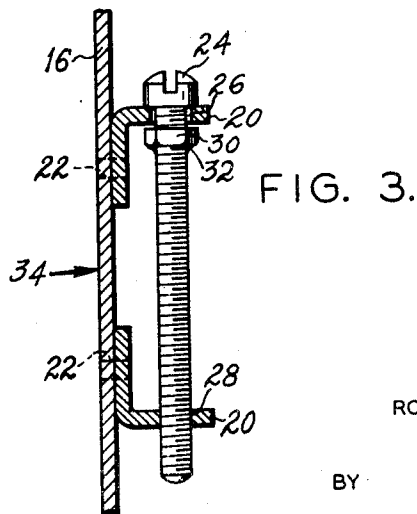
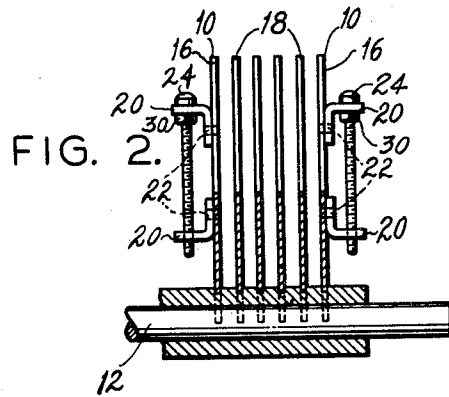
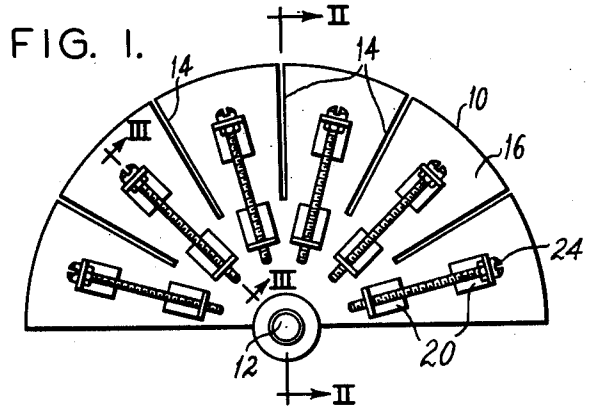
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CONDENSER ADJUSTING DEVICE

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CONDENSER ADJUSTING DEVICE

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This invention relates to condensers of the variable air dielectric type and more particularly to an adjusting device for the plates thereof.

The outer plates of tuning condensers such as are used in radio receivers and the like are generally provided with a series of radially extending slots that form substantially oriented sections which may be individually bent away from or toward the next adjacent plate to vary the capacity of the condenser. This adjustment is known as a "tracking adjustment." One example of the necessity for such "tracking adjustment" is where it is desired in a radio receiver, to simultaneously tune the radio frequency and local oscillator stages in order to produce an intermediate frequency for further amplification. Here, due to the irregularities in the capacity change between stages in a "ganged" arrangement, it is often necessary to bend the slotted sections on the outer plates of each "gang" a small amount to vary the capacity of the "gang" slightly at that point in the condenser rotation.

Heretofore, this critical adjustment has been made by using a pair of pliers to bend the plates to what was estimated to be the desired amount. By repeated bending operations and trial and error method, the desired result was finally achieved. This manner of obtaining the adjustment is manifestly unsatisfactory for obtaining efficient, direct, and precise adjustment. In addition, this method is fraught with the hazard of causing adjacent, unslotted plates of the condenser to become disaligned by contact with the nose of the pliers.

Accordingly, it is an object of the present invention to provide an adjusting device for permitting this "tracking adjustment" to be made to the plate of a condenser in a smooth, accurate and efficient manner and without danger of damage to the adjoining plate of the condenser.

Another object of the invention is to provide a device of this character which is simple in design and construction, inexpensively manufactured and reliably operative in making minute changes in the capacitance of condensers.

With the above and other objects and features in view, the invention will now be described with reference to the accompanying drawings which illustrate a preferred embodiment of the invention and will be pointed out in the claims.

In the drawings:

Fig. 1 is an end elevation of the outer plate of the rotor of a variable condenser illustrating the improved adjusting device mounted thereon;

Fig. 2 is a detailed sectional elevation taken along the line II—II of Fig. 1; and

Fig. 3 is a detailed sectional elevation of one of the adjusting screw units, said section being taken along the line III—III of Fig. 1.

Referring to Fig. 1 there is shown the outer plate 10 of a variable air dielectric condenser mounted on the conventional rotor shaft 12. The outer plates 10 (Fig. 2) are provided with radially extending slots 14 to form substantially oriented sections 16 that may be individually flexed either toward or away from the adjacent plates 18 of the condenser to vary the capacitance of the latter. As previously stated, it has been the practice heretofore, to bend the sections 16 by using a pair of pliers. It will be readily seen from reference to Fig. 2 that the insertion of even long nose pliers between the delicately mounted plates 18 and 10 is likely to cause misalignment of the adjoining plate 18 by contact of the pliers therewith.

To overcome these difficulties, the present invention provides an independent, individual adjustment for each of the sections 16. Each adjusting means comprises a pair of oppositely disposed angular lugs or projections 20 secured as by riveting or welding as at 22 to the outside of the outer plates 10. The lugs 20 for each section are arranged in spaced relation and in alignment with each other. If desired, the lugs may be struck from the metal of the condenser plate 10 although preferably it is believed to be more satisfactory to mount the lugs on the plates as shown.

A headed adjusting screw 24 passes through an opening 26 in the upper lug 20 with clearance and the shank of the screw is threaded into an opening 28 provided in the lower lug. Means for preventing any substantial longitudinal movement of the screw with respect to the upper lug 20 is provided by a nut 30 which is threaded on the shank to a position where just sufficient clearance is provided between the undersurface of the lug and the upper surface of the nut to provide for free rotation of the screw 24. The nut is secured in this position by either jamming it upon the threads of the screw or soldering the nut thereto as indicated at 32. In this manner the screw is rotatably mounted in the upper lug but anchored therein against longitudinal movement.

In operation, by inserting a screw driver in the slot of the screw and rotating the screw in one direction its section 16 is caused to bend slightly at a point approximately indicated by

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the arrow 34, thereby flexing the section 16 away from the next adjacent plate 18. Upon rotation of the screw in an opposite direction, as the nut 30 engages the undersurface of the upper lug 20 the section 16 is caused to flex in an opposite direction at the point 34, or, toward the next adjacent plate 18. In this manner any one of the sections 16 may be positively flexed in the proper direction to precisely the desired amount, with a very high degree of accuracy, and without the possibility of damaging the adjacent plates. Hence, "tracking adjustments" may be simply and readily accomplished with maximum ease and with assurance to the operator of positive control over the degree of adjustment being made.

The invention described herein may be manufactured and used by or for the Government of the United States of America for government purposes without the payment of any royalty thereon or therefor.

Having described the invention what is claimed as novel and desired to be protected by Letters Patent of the United States is:

1. Apparatus for adjusting the capacitance variation as a function of rotation of a variable condenser having a plate formed with radial segments extending from a central body portion, said apparatus comprising, a first lug projecting normally from substantially the center of area of a segment, a second lug projecting normally from said body portion in spaced radial alignment with said first lug, and a screw rotatably anchored in said first lug and threaded in said second lug, whereby upon turning said screw in one direction said segment may be positively flexed to one side of the plane of said body portion, and upon turning said screw in an opposite direction, said segment may be positively flexed

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to the other side of the plane of said body portion.

2. Apparatus for adjusting the capacitance variation as a function of rotation of a variable condenser having a circular plate formed with radial segments extending from a central body portion, said apparatus comprising, a first lug projecting normally from substantially the center of area of a segment and positioned radially inward from the peripheral edge of said segment, a second lug projecting normally from said body portion in spaced radial alignment with said first lug, a headed screw connecting said lugs, the portion of said screw adjacent its head passing with clearance through said first lug and the shank of said screw being threaded in said second lug, and means secured to said screw adjacent said first lug for engaging said lug when the screw is rotated in a direction opposite to that in which the head of said screw is caused to engage said lug.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,831,590	Ferguson	Nov. 10, 1931
2,000,686	Bailey	May 7, 1935
2,052,316	Sagle	Aug. 25, 1936
2,161,532	Sakren	June 6, 1939
2,208,837	Eix	July 23, 1940

FOREIGN PATENTS

Number	Country	Date
303,758	Great Britain	Mar. 27, 1930
378,291	Italy	Jan. 30, 1940