

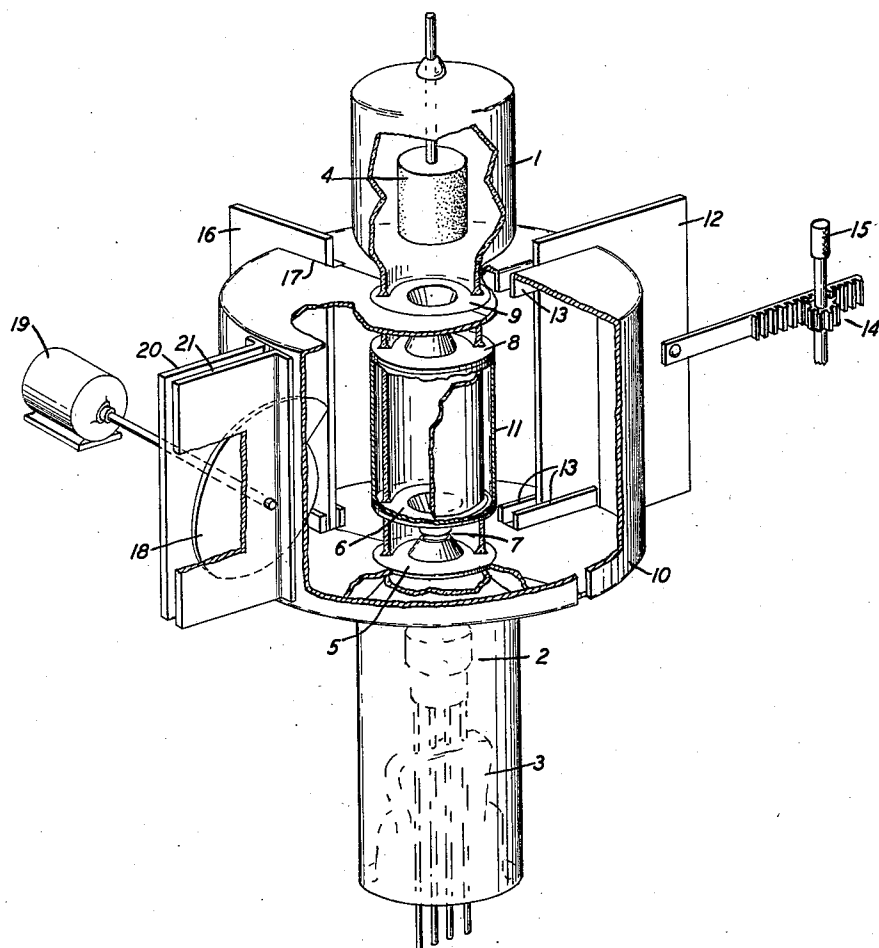
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TUNING ARRANGEMENT FOR CAVITY RESONATORS

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TUNING ARRANGEMENT FOR CAVITY
RESONATORS

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3 Claims. (Cl. 178-44)

This invention relates to tuning arrangements for resonating chambers, sometimes called cavity resonators, and is particularly applicable to ultra-high frequency wave technique.

In accordance with the invention one or more slots are provided in the walls of the resonating chamber, the slot being designed to accommodate a slidable conductive plate that may be inserted into the body of the resonator to any desired distance. The tuning depends upon the degree of insertion of the conductive plate. The arrangement is adaptable either for coarse or fine tuning adjustments and also to produce frequency modulation in a resonant cavity. The latter effect may be obtained, for example, by making the conductive plate in a cam-shaped form which may be rotated in any suitable manner. Alternatively, a tuning plate may be vibrated in its own plane to produce frequency modulation.

A feature of the invention is the provision of a pair of protective plates of conductive material, one at either side of the slot and mounted parallel to the tuning plate to minimize the escape of electromagnetic radiations through the slot while permitting free motion of the tuning plate.

Other features and objects of the invention will become evident from the following description in conjunction with the accompanying drawing while the scope of the invention is defined in the appended claims.

In the drawing the single figure shows a resonating chamber associated with an electron beam tube and provided with a plurality of tuning plates.

The envelope of the tube is indicated at 1 and encloses an electron beam emitting device or electron gun indicated generally at 2 and mounted upon an inwardly extending stem 3 in conventional manner. The tube also contains a collector electrode 4, a pair of electrodes 5 and 6 defining an input gap 7 and a pair of electrodes 8 and 9 defining an output gap. The electrodes 5 and 9 are connected with an outer casing 10, while the electrodes 6 and 8 are connected to an inner casing 11, the electrodes, connections and casings all being preferably of high conductivity. The resonant chamber is comprised between the casings 10 and 11. A conductive tuning plate 12 projects into the interior of the resonant chamber through a suitable slot in the casing 10 and is guided by suitable flanges 13. Means such as a rack and pinion device 14 adjustable by means of a knob 15 is connected with the plate 12 in any suitable manner. Al-

ternatively, a plate 16 is shown with a frictional engagement in a slot 17, which plate may be manually adjusted without the use of any mechanical gearing.

To effect frequency modulation a plate 18 may be provided of cam-like form with any desired shape and may be suitably mounted so as to partially extend into the interior of the resonating chamber. The plate may be rotated by a motor 19 or other suitable means. Protective plates 20 and 21 of conductive material closely spaced from the plate 18 may be provided, if desired, to minimize the escape of electromagnetic radiations through the slot into which the plate 18 projects and at the same time to permit free rotation of the plate.

A fine adjustment may be obtained by employing a single tuning plate and larger adjustments may be secured by the use of a plurality of plates moved simultaneously or successively in any suitable manner.

What is claimed is:

1. The combination of a cavity resonator, a conductive plate projecting into the interior of the resonator through a slot in the wall thereof, means for varying the extent of projection of the plate within the chamber and a pair of protective plates of conductive material, one at either side of said slot and mounted parallel to said variable plate to minimize the escape of electromagnetic radiations through said slot while permitting free motion of said variable plate.

2. Means for modulating the frequency of oscillations in a resonating cavity comprising a rotatable conductive cam-shaped plate variably extending into the interior of the resonating chamber through a slot in the wall and a pair of protective plates of conductive material, one at either side of said slot and mounted parallel to said rotatable plate to minimize the escape of electromagnetic radiations through said slot while permitting free motion of said rotatable plate.

3. Means for producing cyclic variations in that resonant frequency of a cavity resonator comprising a rotatable conductive cam-shaped plate partially extending into the interior of the cavity through a slot in the wall, means for rotating said plate and a pair of protective plates of conductive material, one at either side of said slot and mounted parallel to said rotatable plate to minimize the escape of electromagnetic radiations through said slot while permitting free motion of said rotatable plate.

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