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TUBE FOR PRODUCING MULTIPLE WAVE LENGTHS

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11 Claims. (Cl. 250-33)

This invention relates generally to electric devices excited by electric impulses and more particularly to multiple wave length conducting and/or producing means. This invention has for its primary object the provision of such means disposed within a vacuum tube or a tube containing rare gas or gases.

My work over a period of more than 20 years has led me to the belief that there is a great need for means conducting and/or producing multiple wave lengths which may be employed in many industrial and medical fields. Suitable apparatus for producing waves of various lengths is disclosed in my U. W. Letters Patent No. 1,962,565, dated June 12, 1934. Embodiments of this apparatus have been in use the world over. Because of the need for simplification in such apparatus so that it may be handy and easily used by persons lacking skill in electrical matters, I have concluded that by providing one unit which incorporates oscillation generating means and another in which the wave lengths are produced, the apparatus may be more universally used in the treatment of cellular life in therapy, in the aging or treating of liquids and in other industrial fields.

The present invention deals with those units, preferably combined with one another and constructed as a portable device and as stated above, has for its major object the provision of a unitary multiple wave length producing and/or conducting device in the form of a vacuum tube.

The present invention further contemplates the incorporation in such a tube, of means for varying the effect of wave lengths, or selectively employing the means therefor enclosed in or forming part of said tube.

This invention further seeks to provide a tube of the indicated type incorporating means for generating oscillations.

Another object of the invention is to provide a single unit which contains an oscillation generator, which produces waves of definite frequency, and further inductance mans each permitting emanation of wave lengths of various values.

The structural features of my invention also form a material part of this disclosure, the objects and advantages being attained in structures

such as shown in the accompanying drawing, which exemplifies the invention. The following specification, based on said drawing, more clearly points out the purposes and advantages of my invention.

In the drawing:

Fig. 1 is a vertical, partial sectional, partial elevational view of a tube incorporating features of my invention.

Fig. 2 is a similar view of an alternate form thereof.

Fig. 3 illustrates in a similar manner a modified form of my invention.

Fig. 4 is a fragmentary sectional view of a modification made in accordance with the invention.

Fig. 5 is a similar view of another modification.

Figs. 6 and 7 are sectional views illustrating type of wires used in either of the forms of my invention as shown in Figs. 1, 2 and 3.

Fig. 8 is a partial sectional, partial elevational view illustrating a tube incorporating a plurality of grids and selective capacity means for varying the effects of said grids.

Fig. 9 is a similar view of a tube, such as shown in Figs. 1 or 2 and incorporating oscillating or vibrating means.

In that form of my invention shown in Fig. 1, there is provided a sealed preferably transparent envelope (10) made of glass or like material affixed in the usual manner to a screw or Edison plug (11). The latter is conventionally provided with a shell terminal (12) and a central terminal (13). The support of seal (14) of the tube serves to hold wires such as (15) and (16) which connect to the terminals (12) and (13).

Connected to the wires (15) and (16) is a primary inductance member in the form of a loose coil (17) which may be disposed axially of the envelope (10), as shown. The upper end of said member (17) forms a tight wound coil (13) which serves to radiate the strongest induced wave lengths.

Surrounding the primary inductance member (17), there are arranged a plurality of separate coils of wire each being of different length and capacity. Thus, I provide a coil (19) having greatest capacity and successive coils (20), (21), (22), (23), (24) and (25), each having less capacity the the preceding coil. These coil (19) to (25) form secondary inductance means each permitting emanation of a wave length of different magnitude and value than the other.

I may support the secondary coil in several ways. As shown, I prefer to provide a dielectric member such as a glass sleeve (26) surrounding the primary inductance wire member (17) and to mount the secondary coils (19) to (25) on the outer surface of said sleeve, leaving the coil (18) exposed at the top thereof. In order to effectively support and centralize the glass sleeve (26), I provide spacing washers (27) and (28) of mica or the like, top and bottom, and provide a supporting cross-piece (29) on the lower portion of the wire (17).

The tube above described may be employed as indicated for the treatment of cellular structures by connecting it to any one of the rings in the electrostatic field of high frequency, such as shown in said U. S. Letters Patent No. 1,962,565, each of the coils (18) to (25) producing by induction a different wavelength, as can be understood.

In the form of my invention shown in Fig. 2, the envelope (10a) is somewhat differently shaped, and the wire (17a) straight instead of arranged as an open coil. In other respects, the structure follows that described with reference to Fig. 1.

As show in Fig. 3, there may be arranged a plurality of open rings (30), (31), (32), (33), (34), (35), (36), (37), (38), (39) and (40) in frustro-conical form, for instance, with the largest of said rings at the top and the smallest one adjacent the bottom. I have shown said rings as supported, for instance, by glass posts (41) and (42), said posts being supported on the seal (14b), as by a band (43). I provide extensions for the terminal wires (15a) and (16a) and connect said extensions (44) and (45) to the upper ring (30) and the next lower ring (31), respectively.

The rings (30) and (31) may become the primary inductance members, whereas the remaining rings constitute the secondary inductance members as before set forth. Electric current conducted to the suitably spaced rings (30), (31) will cause a spark (48) to be drawn between the rings (30) and (31) providing oscillations emanating from electrical discharges there-between and causing the radiation of waves of various lengths within the envelope (10b) and affecting the remaining rings.

In Figs. 1 and 2, I have shown the secondary coils as formed of wires having uniform cross-section. Fig. 4 illustrates how such wires may be made progressively smaller in the succeeding coils (19c), (20c), and (21c), etc. In such various manners, the wave length producing effect of the secondary coils or rings may be arrived at.

The secondary coils or rings may be round or somewhat flattened wire as shown in Fig. 6 or tubular as in Fig. 7, offering a yet greater flexibility of design.

The devices of Figs. 1 and 2 above described may be incorporated in the system shown in said U. S. Letters Patent by connecting one of the rings (a), (b), (c), (d), (e), or (f) with plug (11) of Fig. 1, since either terminal (15), (16) is in contact with primary inductance member (17). To this end a conductor (not shown) connects such a ring with said plug or socket.

In Fig. 8, I have shown a modification of the invention which comprises a vacuum tube (50) containing a plate (51) and a plurality of different wave lengths producing grids (52), (53), and (54). I connect each grid with a variable capacity device, such as (55), (56), and (57) carried by said tube (50) and preferably by its base support (62), whereby the grids may be selectively connected into an operating circuit (not shown) by means of the respective prongs (58), (59), and (60), and the place prong (61). Heating or other exciting means may be incorporated in the tube in a well-known manner. This combination tube (50) is designed to replace a plurality of known tubes each operating with different and variable wave length effect, more exterior manipulation at said base support brings about change of the capacities (55), (56), and (57) and cutting in one or more of the grids (52), (53), and (54).

The effect of the spark as produced in form of the invention depicted in Fig. 3 may be further utilized in Fig. 9 in which I also incorporate a vibrator (62) which produces electrical oscillations by a spark intermittently generated between the end of the primary inductance member (17d) and vibrator armature (64). In other respects the structure follows that of Fig. 1.

It may be noted that any type of spark producing or oscillation generating means may be substituted for the vibrator shown. The tubes shown in Figs. 3 and 9 may be used in the manner described for Fig. 1 by

connecting one terminal of the base as set forth to produce an induction effect. These tubes may be also connected across both terminals with a suitable potential to obtain the spark effect.

From the foregoing it may be seen that I have provided tubes in various forms for the purpose of generating and conducting multiple wave lengths. Other forms of the invention may be produced within the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim as new and desire to have secured by Letters Patent, is:

1. A device of the character described comprising a vacuum tube having an envelope and base, primary inductance means, and a plurality of separate secondary inductance means of different length for radiating waves of various lengths extending above said primary inductance means, all said inductance means being arranged within said envelope.

2. A device of the character described comprising a vacuum tube having an envelope and base, a primary inductance member axially arranged in said envelope, and a plurality of secondary inductance members spaced apart and independent from each other each member surrounding a respective portion of said primary inductance member and within the field of influence thereof.

3. A device of the character described comprising a vacuum tube having an envelope and base, a primary inductance member axially arranged in said envelope, and a plurality of secondary inductance members each surrounding the primary inductance member and within the field of influence thereof, each of said secondary inductance members having a different wave length effect than the others.

4. A device of the character described comprising a vacuum tube having an envelope and base, a primary inductance member comprising a pair of split rings in inductive relation, and a plurality of secondary inductance members each comprising split rings.

5. A device of the character described comprising a vacuum tube having an envelope and base, a primary inductance member comprising a pair of split rings in inductive relation, and a plurality of secondary inductance member each comprising split rings, said latter rings being arranged in different planes and being of different length to produce a different wave length effect.

6. In a device of the character described, means for producing multiple wave lengths comprising a wire member, enclosing dielectric means for said member, and a plurality of separate wire coils of different lengths on said dielectric means and in the field of inductance of said wire member.

7. In a device of the character described, means for producing multiple wave lengths comprising a wire member, enclosing dielectric means for said member, and a plurality of wire on said dielectric means and in the field of inductance of said wire member, each coil extending over said wire member and having a different number of convolutions than the others.

8. In a device of the character described, means for producing multiple wave lengths comprising two split rings in inductive relation, and a plurality of split rings in inductive relation to the two split rings.

9. In a device of the character described, means for producing multiple wave lengths comprising two split rings in inductive relation, and a plurality of split rings in inductive relation to the two split rings, the plurality of rings being of smaller diameter than the mentioned two

rings and each progressively smaller than the others.

10. In a device of the character described, means for producing multiple wave lengths comprising two split rings in inductive relation, and a plurality of split rings in inductive relation to the two split rings, the plurality of rings being of smaller diameter than the mentioned two rings and each progressively smaller than the others, all of the rings being arranged in frusto-conical disposition.

11. In a vacuum tube having a primary inductance member and secondary inductance members, a vibrator arranged in the field of influence of said primary inductance member and secondary inductance members, a vibrator arranged in the field of influence of said primary inductance member for affecting the induction of said secondary members.

GEORGE LAKHOVSKY

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Fig. 1.

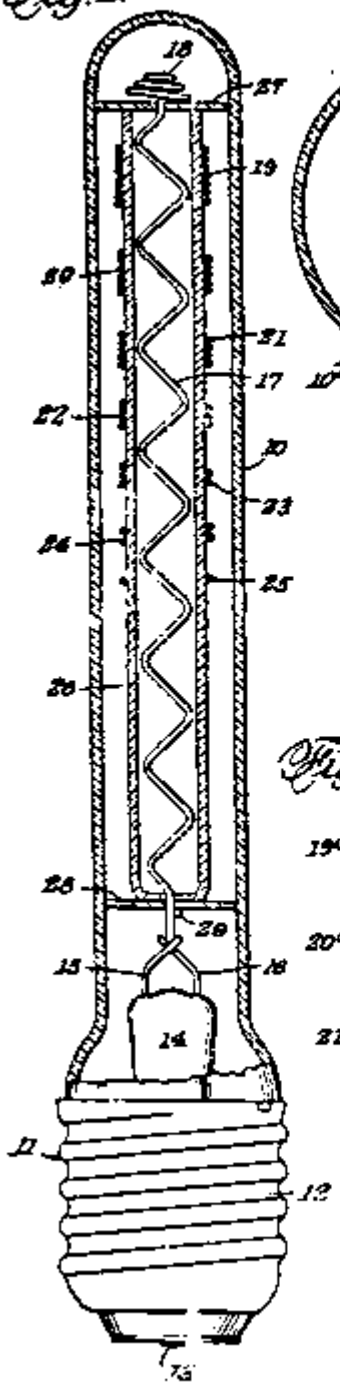


Fig. 2.

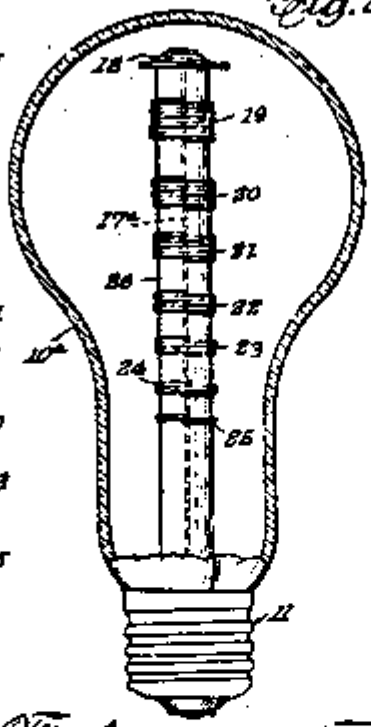


Fig. 3.

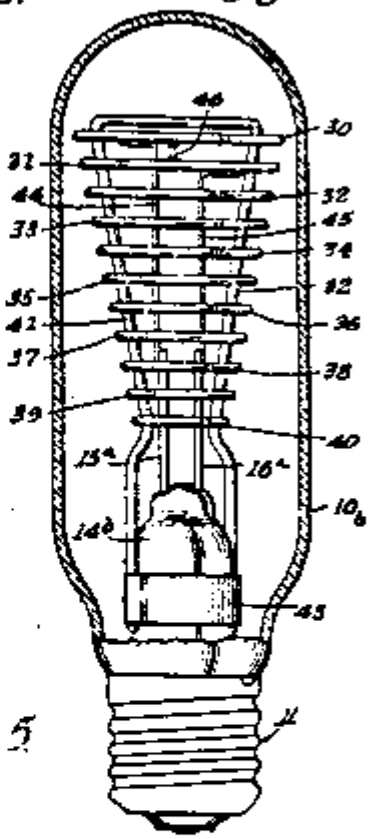


Fig. 4.

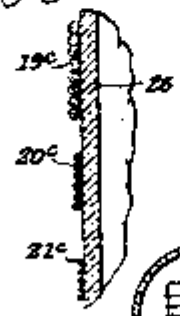


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

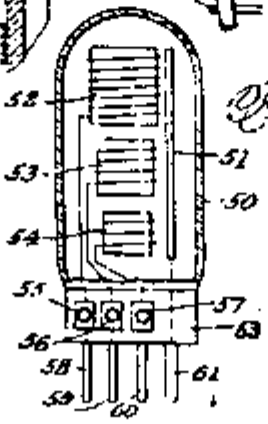
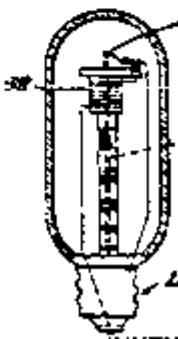


Fig. 9.



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