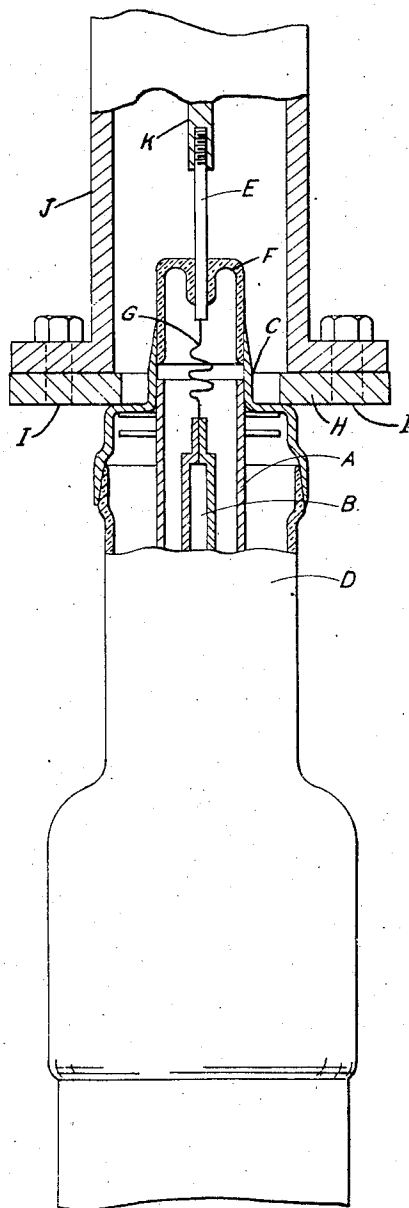


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F. D. GOODCHILD ET AL
ELECTRON DISCHARGE APPARATUS

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ELECTRON DISCHARGE APPARATUS

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Application December 2, 1943, Serial No. 512,578
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4 Claims. (Cl. 315-5)

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This invention relates to electron discharge apparatus incorporating high frequency resonators of the coaxial conductor type and is an improvement in or modification of the invention disclosed in patent application No. 399,599 and in British Patent No. 537,490 referred to therein.

In that application, means is shown for extending the coaxial conductors forming the resonator outside the envelope of the tube, so that the electrical length of the conductors may be varied by means operating upon the part of the conductors outside the envelope.

According to the present invention, the outer coaxial tube of the resonator chamber is connected to a metal end cap which is sealed to the envelope of the tube, and adapted for direct connection to the external circuit, and the inner portion of the resonator is connected to a conductor insulatively sealed into the end of the metal cap, whereby the tube may be readily connected into an external coaxial transmission line.

The accompanying partly sectional diagrammatic drawing illustrates one embodiment of the invention. It illustrates high frequency electron discharge apparatus incorporating a high frequency resonator of the coaxial conductor type, the detailed structure of which is illustrated in an application of C. H. Foulkes, one of the inventors herein, filed November 20, 1943, Serial No. 511,099. The outer coaxial tube of the resonator chamber is indicated at A and the drift tube at B. The metal end cap C is sealed to the glass envelope D and carries the central conductor E within a glass seal F. This central conductor is connected by a flexible lead G with the drift tube B. The resonator tube A is a push fit within the metal cap C so that the two are electrically connected and the external output circuit comprising a coaxial transmission line having an outer member J and an inner member K, may be connected direct to the cap C and central conductor E. Tuning of the resonator may also thus be effected externally of the tube. The metal cap C is preferably provided as shown with a metal flange H soldered thereto whereby the tube may be readily connected to an external coaxial transmission line J by bolts passing through holes I in the flange. The central conductor E may be screw-threaded at the end for ready connection to the central conductor K of the transmission line.

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What we claim is:

1. High frequency electrical discharge apparatus of the coaxial resonator type comprising inner and outer coaxially disposed resonator members, an envelope enclosing said resonator members, a metal end cap connected to said outer resonator member and sealed to said envelope thereof, an elongated member connected to said inner resonator member, coaxially disposed therewith, and insulatively sealed to said metal end cap, said cap and said elongated member being adapted to couple directly to an external coaxial transmission line.

2. Apparatus as set forth in claim 3 in which the outer coaxial conductor forms a portion of the envelope wall.

3. High frequency electrical discharge apparatus of the coaxial resonator type comprising inner and outer coaxial resonator members, inner and outer coaxial conductors electrically connected to said members, said outer coaxial conductor being provided with a wall portion fitting against an end portion of the outer tubular coaxial resonator member, an envelope enclosing said members, including an insulating portion connecting said conductors, the conductors having coaxial portions exposed at the outer side of said envelope for direct connection to an end of a coaxial line.

4. Apparatus as set forth in claim 1, in which said cap includes a coaxial flange terminal to which said outer coaxial transmission line may be readily engaged.

FRANK DOUGLAS GOODCHILD.
CHRISTOPHER HENRY FOULKES.

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