My New Noninterfering Detector

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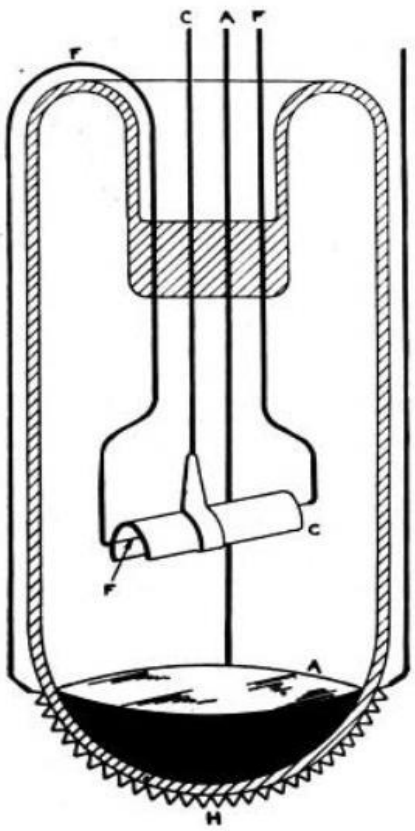


Figure 1. Diagrammatic illustration of the construction of the Donle noninterfering detector tube. In this illustration, (F) is the filament, which after passing through the tube, is cemented to the outside of the glass, where it acts as a heater (H), for the anode (A) which is metallic sodium. This heater's purpose is to maintain a proper operating temperature for the anode. (C) is the collector electrode, made of metal and located directly above the filament (F).

The photograph at the right shows the inventor, Mr. Donle, and his new tube, which, because of its inability to produce oscillation, is known as the "noninterfering detector." One of the peculiarities connected with the operation of this tube is that if the telephones are placed in the collector electrode-circuit instead of the anode circuit, the signals will be received with practically the same intensity.

ONE of the least efficient elements of modern radio is, despite the large amount of development since coherer days, the detecting system. Our best detectors are insensitive things when compared to galvanometers or telephones, and there appears room for considerable advance in increasing detector effectiveness.

The ordinary three-element tube as a simple detector is not nearly sensitive enough to satisfy the present demands. Many attempts have been made to increase this sensitivity by including within the tube a gaseous atmosphere and while extremely effective detectors have been thus produced, they have required very delicate adjustment and in the majority of cases were not stable and required constant attention. Furthermore, it has been found practically impossible to reproduce in quantity tubes of uniformly maximum sensitivity.

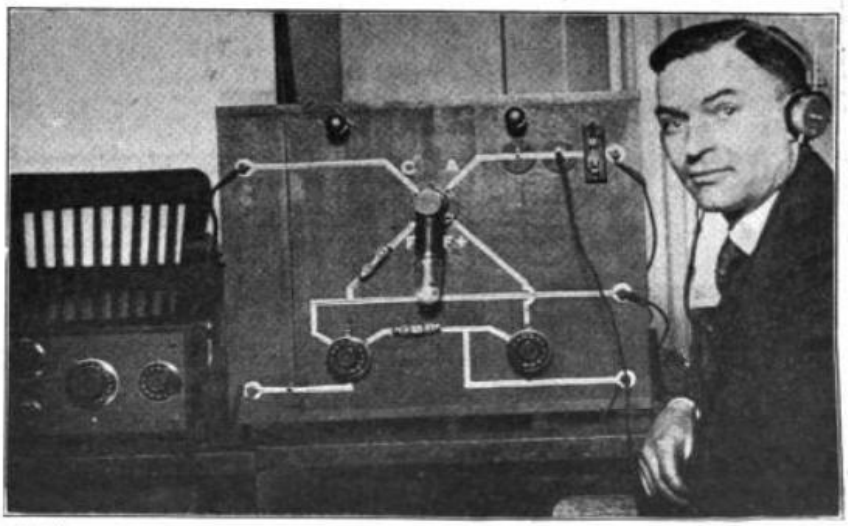
The three-element electron tube and regenerative circuit is largely used at present for reception of radio signals. While it gives excellent results and certainly far exceeds in response any other method disclosed to date, nevertheless it has certain disadvantages and its widespread use has created a situation which is bound to retard the popular use of radio.

By using the three-element detector in a regenerative circuit greatly increased sensitivity is secured, but if regeneration is carried far enough to give worth-while response, there is produced considerable signal distortion. Furthermore, adjustments are critical, the slightest variation in capacity destroying the operating adjustment. What is still more important, the radiation from many regenerative circuits, particularly in the hands of inexperienced operators, creates an alarming amount of interference which if continued will seriously hamper reception of the present broadcasting programs.

There seems to be a definite need for a receiving tube which under no condition can radiate any energy from the antenna to produce interference, which can be easily adjusted, which is not affected by the body capacity while the circuit is being tuned, and yet which secures all this at no sacrifice of sensitivity and loudness of response.

For several years we have conducted experiments on many different forms of detectors, and particularly upon detectors employing ionization of metallic atoms. This was a most promising field of development since such ionization was found to be readily controlled and stable. As one of the results of this work we have developed the present tube which is the logical result of experimental work which we have done along these lines. This new tube has none of the disadvantages of regenerative and gaseous detector systems above mentioned. Its method of operation seems to involve many interesting phenomena, which are radically different from those occurring in other tubes.

The construction of one form of this tube is illustrated diagrammatically in Figure 1 where *F* is the filament, *A* is the anode, which may be of metallic sodium in the bottom of the tube, and *H* is the heater, which is a short length of resistance wire cemented to the outside of the glass directly underneath the anode. This heater maintains the anode at proper operating temperature. *C* is the "collector" electrode of sheet metal bent into a "U" and positioned above the filament with its open side toward the anode.



(C. Photonews)

Harold P. Donle and his noninterfering detector.