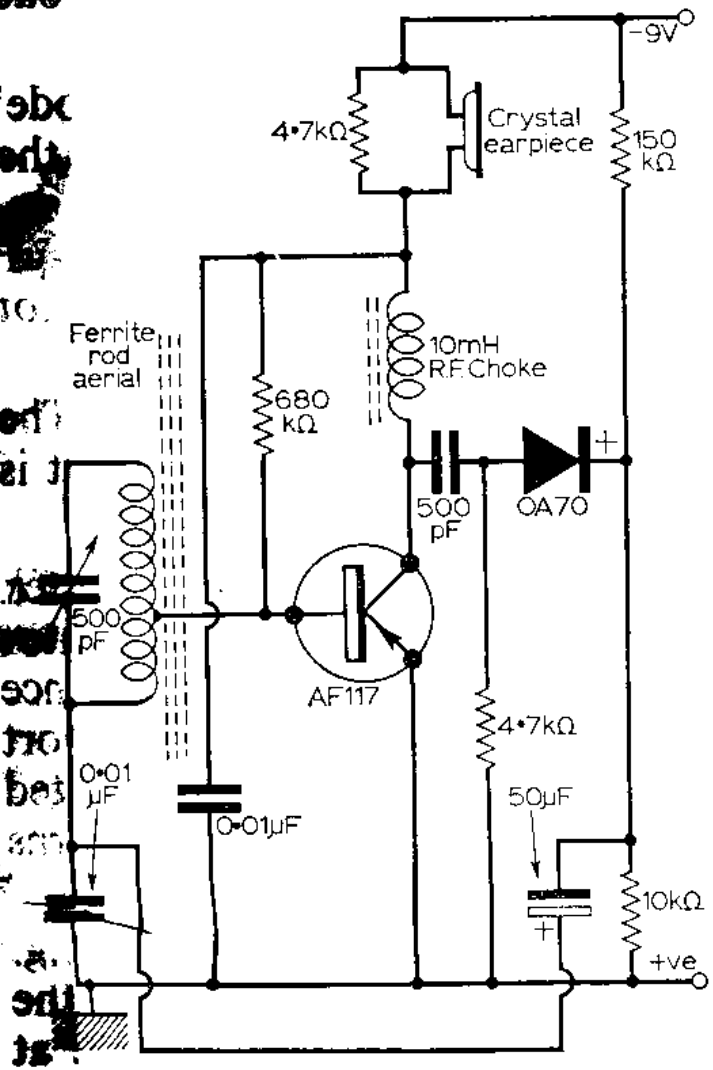

Fig. 15.

Small reflex receiver circuit

An interesting circuit of a 'reflex' receiver is given in Fig. 15. This uses one transistor only and a germanium diode detector, the output being sufficient to operate a small crystal earpiece at low-level. No outside aerial is needed as the sole tuned circuit is wound on a length of ferrite rod, which then acts itself as the aerial.

The signal picked up by the aerial is fed, from a suitable low impedance tapping, to the base of the transistor, this being biased by a single high-value resistor to the supply negative line. Owing to the very small current involved, no emitter resistor is used.

The transistor thus amplifies the aerial signal and develops it across the r.f. choke in the collector circuit. The 'cold' side of this is held at low signal potential by the 0·01µF capacitor to the battery positive line, and the r.f. signal at the collector is coupled to the diode detector through 500pF capacitor.

The diode's d.c. circuit is completed through the 4·7kΩ resistor, which the load consists of the 10kΩ resistor to the diode 'cathode'.

Detector efficiency is improved by the 150kΩ resistor from the 'cathode' putting a little forward current in the diode from supply negative line. Now, the audio signal developed across the 10kΩ load is coupled through the 50μF electrolytic capacitor to the base of the transistor, via the aerial winding. The 0·01μF gives a return for the aerial signal circuit and at the same time acts as a detector filter.

The transistor thus carries the audio signal as well as the r.f. signal. The audio is developed across the 4·7kΩ resistor in the collector circuit, and it is this which works the earpiece connected in parallel with the load.

It is possible to improve the sensitivity by introducing a little positive feedback to the top of the aerial winding from the collector. A very small value capacitor —probably less than 1pF is all that is required here. If too much capacitance is used the transistor will oscillate and reception will be destroyed. Two short lengths of p.v.c. covered wire connected to the points mentioned and twisted together can be used to control the feedback. Usually, only one or two turns are necessary.

For m.w. use, the aerial winding can consist of about 60 turns of No. 26 s.w.g. enamel covered wire on a rod of about $\frac{3}{8}$in. diameter. The longer the rod, the better the pickup of signal by the aerial. The tap to the base should be made at about 10 turns from the bottom of the coil.