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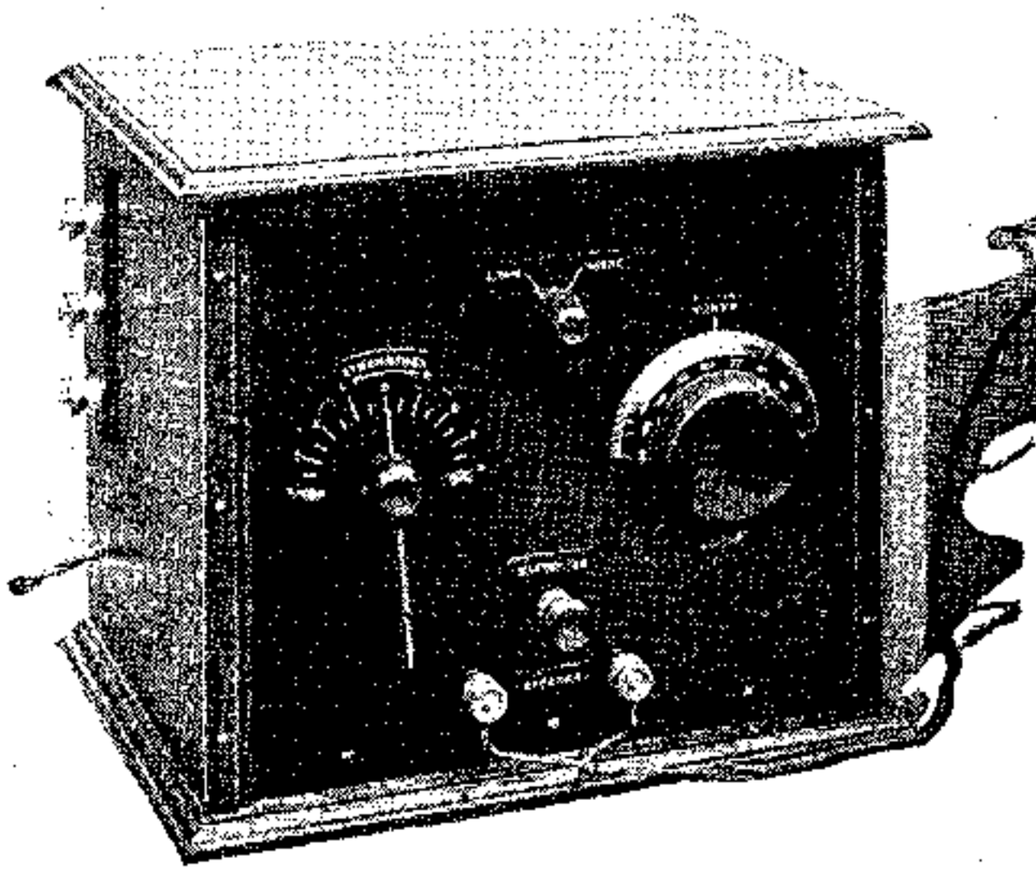
# BROADCAST RECEIVERS

## The GRAVES TWO-VALVE SET

Complete Loud-speaker Equipment Representing Excellent Value for Money.



WE are frequently reminded by the B.B.C. engineers, who presumably have access to the facts, that the majority of licence holders are crystal set users, but there can be little doubt that only a few listen with phones from choice. The average listener is fully alive to the advantages of a loud-speaker receiver, and it is necessity rather than choice which forces him to be content with the humble crystal and phones.

Most loud-speaker equipments cost from £30 to £40, and do not in many cases represent good value for money when compared with other commodities which have been long enough established for their prices to have become stabilised by competition. The average man has a pretty shrewd sense of values, and when he is going to lay out £30 or £40 for a wireless receiver he expects in return rather exceptional service in the matter of quality of reproduction, choice of stations and selectivity. He may not be fortunate in finding the few makes at this price which will give the service required, and will probably decide to stick to the old crystal set—unless he can find a set giving loud-speaker results at a price comparable to, say, a gramophone.

### A Two-station Set.

The Graves Two-valve Loud-speaker Set exactly fills this requirement, and in our opinion represents exceptional value for money. As will be seen from the photographs, the equipment is unusually complete, and all components used are of high quality, yet the price is only £7 17s. 6d. The loud-speaker gives ample volume for a moderate-sized room, and the quality is above the average for this class of set. Long or short waves may be received at will by turning a switch, so that the purchaser is assured of a service either from the nearest main station or from Daventry. This appears to be the principal object the makers had in view when producing the set, and, although they make no claim for long-distance reception, it was found possible to tune in on the loud-speaker in London at least half a dozen Continental stations *after the local station had closed down.* From this it will be gathered that the set, though sensitive, has not a high degree of selectivity. This is unimportant under present broadcasting conditions, however, if only one station or at the most two are required.

### Long-wave Efficiency.

The efficiency on the Daventry wavelength is unusually good, and at sixty-five miles excellent volume is obtained. This is one of the few sets that have picked up Daventry in the basement of our Editorial Offices in Fleet Street, using only a short piece of wire for an aerial. Of course, the volume was not very great, but the set did succeed in extricating the Daventry transmission from the electrical mush present in that neighbourhood. Elsewhere in London with a standard 100ft. aerial the volume from Daventry is excellent.

The circuit made use of in this set comprises a reacting detector and a transformer-coupled L.F. amplifier. There are two tuning coils in series, one for short waves and the other a loading coil for Daventry. The range switch simply short-circuits the Daventry loading coil. A single reaction coil serves for both wave ranges. It is mounted on a rotating arm with a 180 degree movement, the operating handle on the front panel being provided with a centre zero scale. The tuning coils are mounted one on either side of the reaction coil spindle, so that when the operating handle is moved to the right the reaction coil is brought over the short-wave coil and to the left over the long wave coil: a particularly neat arrangement which is perfectly satisfactory in practice.

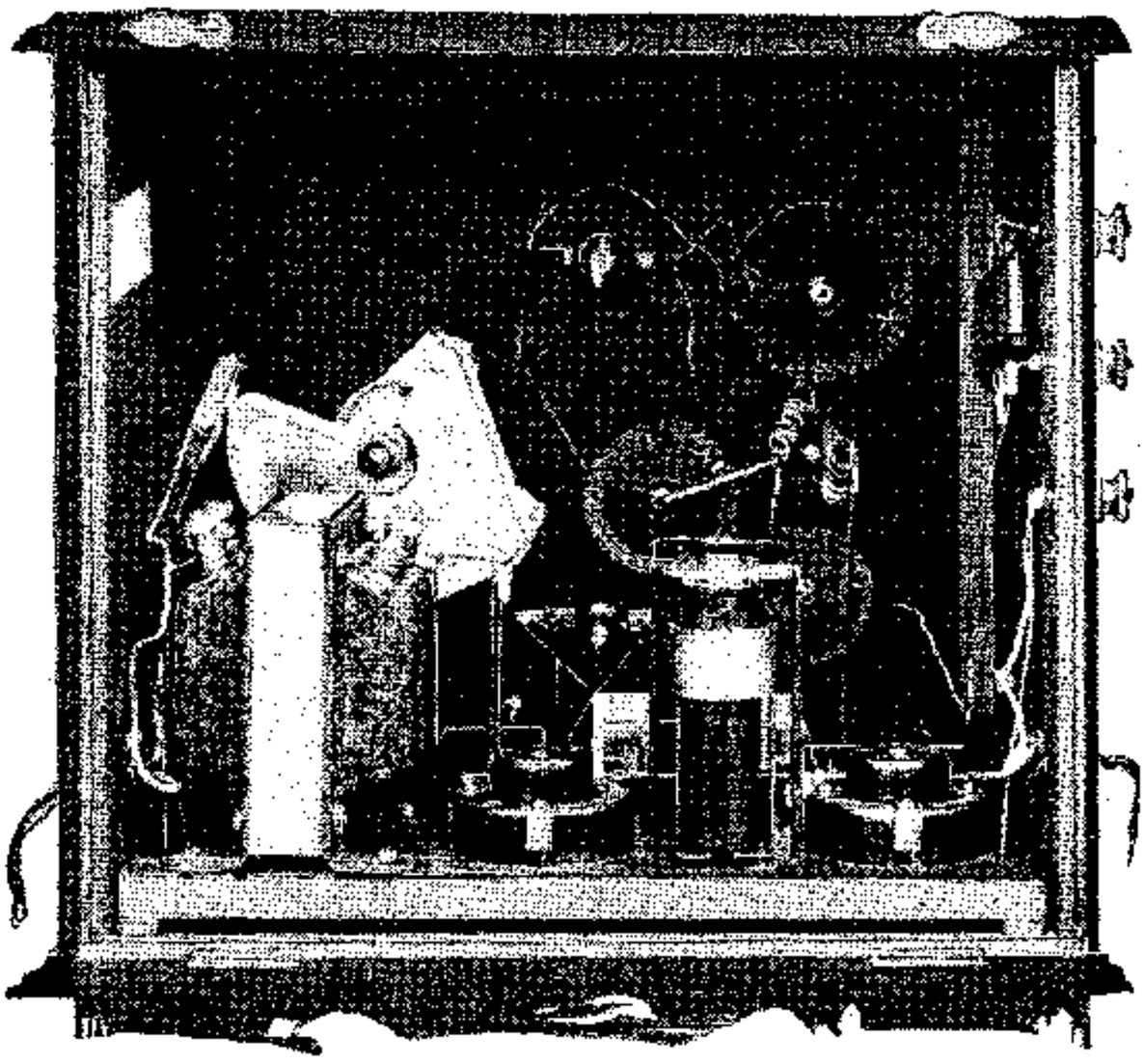
**The Graves Two-valve Set.—**

A "Utility" variable condenser with long, single bearing is used for tuning.

Following the detector valve is a Telsen low-frequency transformer. This component is both bulky and heavy, and therefore fulfils one of the first requirements of an intervalve transformer, namely, plenty of iron in the core and many turns in the windings; it is quite unlike the diminutive instruments usually associated with sets of this class. The primary winding is shunted by a Cosmos fixed condenser to by-pass the high-frequency component of the anode current from the detector valve.

A 4½-volt grid bias battery (flash lamp) for the L.F. valve is neatly mounted between the valve holders, flat spring clips being provided for making connection to the contact strips. Mullard P.M.1 valves are used, and are supported in "Aermonic" spring valve holders.

The cabinet is made of solid figured oak, and is well finished. A hinged back gives access to the interior of the set for the purpose of inserting valves or replacing the grid bias battery. Flexible leads are taken through the sides of the cabinet for connection to the H.T. and L.T. batteries, and a terminal panel is fitted on the left-hand side for aerial and earth connections. There are two aerial terminals between which a Cosmos fixed condenser is connected, and the aerial is joined to the terminal, which gives best results. In general, short aerials should be connected to the lower terminal, which gives direct connection to the tuning coils, and long aerials to the upper terminal, which introduces the fixed series condenser. The loud-speaker is connected to terminals on the front panel.



**Interior of set with valves removed, showing arrangement of tuning and reaction coils.**

### Numerous Accessories.

The accessories which complete the outfit are comprehensive and of excellent quality. Everything seems to have been thought of; there is a complete aerial-earth system, including aerial wire, porcelain insulators, rope halyard and pulley, lead-in tube, earth clip, and leads for connecting to the aerial and earth terminals of the set. The 90-volt H.T. battery is of good quality, and the accumulator is an Oldham 2-volt cell in glass container. The loud-speaker has a mica diaphragm and is adjustable, the finish being a frosted brown enamel which tones well with the cabinet.

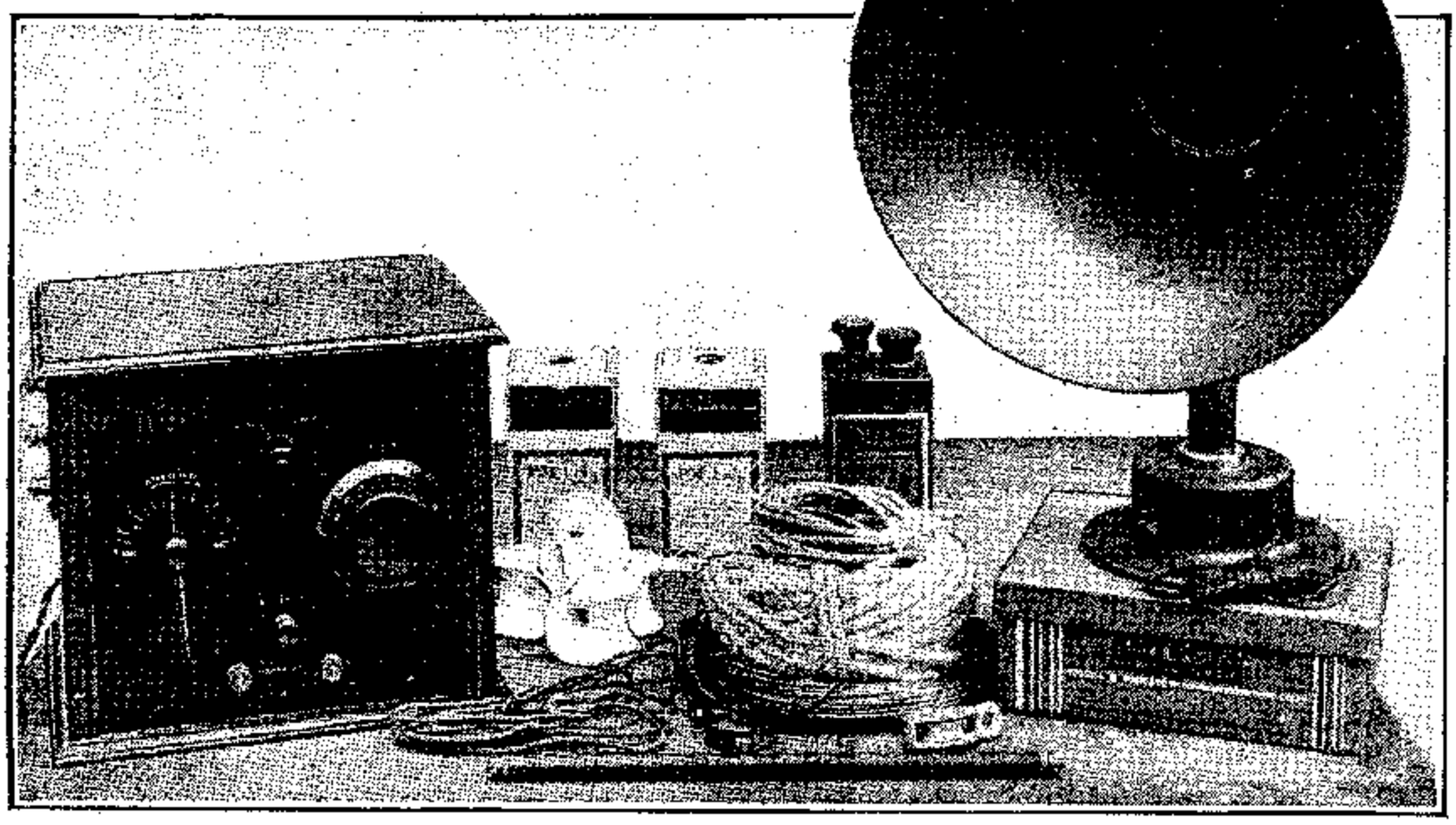
The instructions for erecting the aerial, connecting up and tuning in are lucid, and a large wiring chart removes all possibility of wrong connections.

The price of the complete outfit, as previously noted, is £7 17s. 6d., and special terms for easy payments can be arranged with the makers, Messrs. J. G. Graves, Ltd., Sheffield.

"Back-bedroom manufacturers" and "local experts," who have done so much to discredit broadcast reception with their "junk" sets can no longer compete even in price with this high-quality outfit.

It even competes in cost with home construction, and the would-be listener who has no taste for construction and experimenting can buy this set and have the satisfaction of knowing that he could not have made it himself for a lower price.

Messrs. Graves are doing a service to the art by introducing many people of small means to the possibilities of loud-speaker reception.



**The equipment of the Graves set is unusually complete and includes valves, batteries, loud-speaker and materials for the aerial-earth system.**