

Photograph 1, showing the disposition of the baseboard components.

**T**HIS set has been brought out at the request of a large number of readers who wanted an up-to-date version of the "Browning-Drake" circuit. There are several features that have been changed from the original, and their changing means that the original Browning-Drake is virtually non-existent. However, in the course of the description the method by which the older B.D.'s can be adapted to the circuit will be fully described.

The new features are the differential method of controlling reaction and the can method of shielding the coils. At this stage we have not reduced the

dials to one, mainly owing to the fact that there is some considerable difficulty in matching coils. Coil matching is not a difficult proposition when there is no reaction, but its use introduces complications, and, to be quite frank, at the present we have not been able to successfully balance the three coils. The first two do not present great difficulty, but the condenser controlling the detector coil is as much as 10deg. out at the bottom of the scale, although it is right in phase at the top. However, this difficulty will be overcome, and in a short time we shall bring out a single dial, or, at the most, a two-dial receiver.

We used differential reaction because it is best. Not only does it give smooth control, but it can be operated more easily than the older methods, with the result that oscillation can be minimised. With the screen-grid valves, the constructor need not be afraid of annoying his neighbours.

Another feature of this set is the provision of a third aerial tap leading in through a fixed condenser to the primary of the detector coil. This means that at the required station the

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# The "OUTSPAN

*Simple, Powerful and Economical*  
Developed from the "Browning-Drake"

By the TECHNICAL EDITOR

two screen-grid valves can be cut out and a saving of power thus effected. Country listeners in favourable districts will also find this a great boon. Ample space has been allowed in the lay-out for varying-sized components and for variations in the lay-out. We suggest, however, that as far as possible our specifications be adhered to. A list of components is given and the constructor is advised to purchase them all and to carefully examine them to see that they are exactly as specified, and are in good order.

#### The Baseboard.

THE first actual task is drilling the panel. The position of the three dials, the two knobs, the switch, and

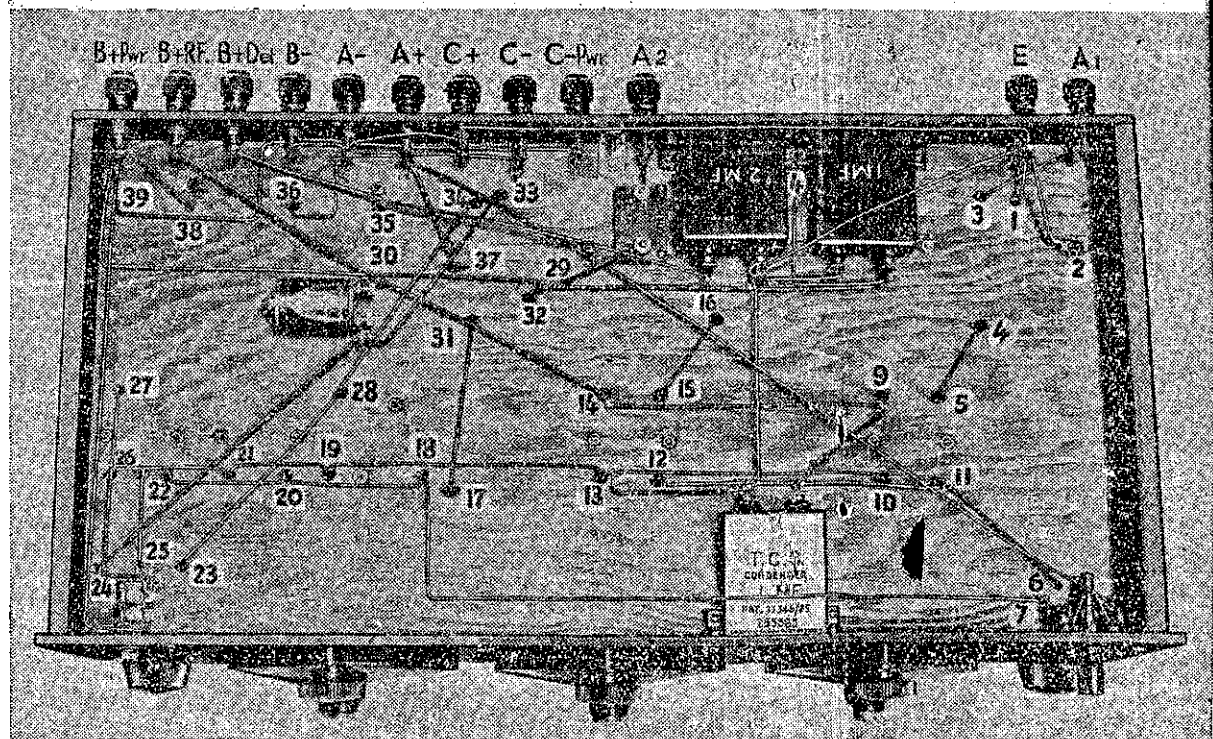
the speaker plug can be seen clearly from photograph 2, the front aspect of the set. The three dials are 4in. from the bottom and separated by 5 $\frac{1}{2}$ in. The rheostat on the left and the reaction control on the right are also 4in. from the bottom. The switch on the left and the plug on the right are 4in. from the bottom, and immediately under the rheostat and reaction control respectively. Having drilled the holes, fasten the rheostat, the reaction condenser, and the condensers in position.

The next task will be to lay out the components on the aluminium sub-panel. This requires some care, as although the parts are not crowded, still the constructor must remember that

shields have to come into position. A general idea of the lay-out can be obtained from photograph 1. Coils and transformers are placed in line at the back of the set, while in a straight line some 4in. away are the valves. They are quite in line from the first radio frequency to power valve. See that the valve sockets are turned round in the right direction. All filament terminals face the power valve while the grid and plate lie in a straight line on the more distant

#### Winding the Coils.

THE coils should now be wound. Divide a foot of 2in. tubing into three lengths for the secondaries, 1 $\frac{1}{2}$ in. tubing, 6in. long, into three



Photograph 4. A view of the under-baseboard wiring.

1. Earth terminal of aerial coil.
2. Shield.
3. Aerial terminal of coil.
4. Grid terminal first r.f. valve.
5. Grid terminal of first r.f. transformer.
6. From rheostat.
7. From switch to rheostat.
8. Screening grid of first r.f. valve.
9. A—first r.f. valve.
10. A+ first r.f. valve.
11. A—second r.f. valve.
12. A+ second r.f. valve.
13. A—second r.f. valve.
14. Screening grid second r.f. valve.
15. Grid of second r.f. valve.
16. Grid terminal of second r.f. coil.
17. Grid leak and condenser, coil side.
18. A+ detector valve.
19. A—detector valve.
20. A+ first audio valve.
21. A—first audio valve.
22. A+ second audio valve.
23. Differential condenser fixed vanes.
24. Differential condenser fixed vanes.
25. Differential condenser moving vanes.
26. A—power valve.
27. Plate terminal of power valve.
28. Plate terminal of detector valve.
29. Plate terminal of regenerator.
30. Plate terminal of first audio transformer.
31. Grid terminal of regenerator.
32. B regenerator.
33. Regeneration coil.
34. Regeneration coil.
35. B+ first audio transformer.
36. G.B. first audio transformer.
37. End of secondary regenerator (return).
38. B+ second audio transformer.
39. G.B. second audio transformer.
40. (Between condensers reading B+ second r.f. transformer.