There are three typical ways of making this coil, the diameter in every case being such that the coil can be slipped inside the end of the secondary without leaving an appreciable space between the two coils, though there must be proper insulation between them, otherwise a "short" of the B battery may result. The three methods are shown in a diagram. One is a bunch of turns of the requisite diameter, bound together in places with twine. The second method is to build up a slotted former of cardboard, the slot round the periphery measuring barely 3-16in. each way. The third method is to turn a similar former out of wood.

Rotating ticklers for the Browning-Drake are close-wound upon a short former of small dimensions; the turns should not be spaced on ticklers. There is no need to endeavour to make the tickler as large as can be rotated in the end of the secondary. A smaller tickler with a few more turns to compensate, will give even better results.

Mounting Coils.

VARIOUS methods of securing solenoids to the baseboard are shown in a diagram. Other suitable means will be devised by the constructor to meet special cases. Small metal angle-pieces may often be bolted to the former and fastened to the baseboard with screws.

Short-Wave Coils.

THIS subject would make an article to itself, and can only be briefly dealt with here. The making of valve-base coils is usually dealt with in the specifications of receivers. For coils of larger diameter 18's wire is often used, on the low-loss plan, only strips of celluloid holding together the turns, which are usually few in number—from 3 to 20. The coil may be secured to a strip of ebonite by bolting it down through extensions of one of the celluloid strips, or by bolting across the inside of the coil, another small strip of ebonite. The tickler, of thinner wire, may be attached to the projecting celluloid strips of the secondary coil, and connected to pins in the ebonite mounting strip so that it plugs in at the same time. The aerial coil, spaced, of few turns, is placed near the grid end of the secondary; it may be made to move on a hinge, or to be variable in some other convenient way.

General Points.

COILS associated with the aerial do not require as many turns as a secondary coil, as there is the added capacity of the aerial. By coupling the aerial to only a few turns of the first stage tuning-coil, as in the Browning-Drake, the added capacity of the aerial is very small, with the advantage that the coil and tuning condenser will then cover a greater range than in the case of the aerial being coupled to the full coil. Loose coupling gives a similar advantage.

Coils with spaced turns require more turns than unspaced ones of the same diameter if required to cover the same range with the same capacity of variable condenser, but they give greater selectivity.

If there is any uncertainty as to the number of turns required on a coil to tune in certain wavelengths, the best way is to put on too many turns. When the receiver is completed, it is easy to remove a few turns so that the highest wavelength station required is just tuned in when the condenser is full in.

Coils of large diameter and short winding length are the most efficient, theoretically, but modern practice does not always recognise the equal-diameter-and-length compromise, as compactness is often a vital consideration, especially in shielded receivers.

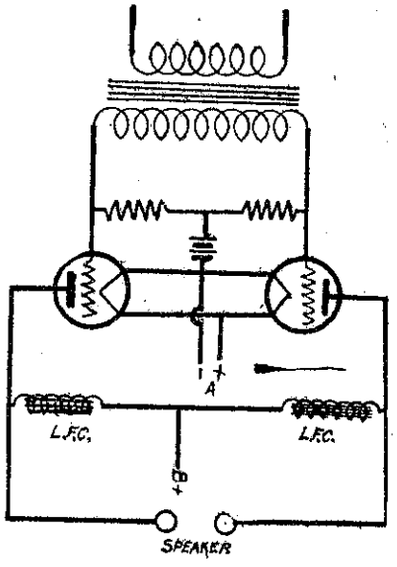
Useful tables will be found in the Listeners' Guide concerning the number of turns required upon coils for various purposes.

Celluloid Cement.

CELLULOID cement is easily made by dissolving chips of celluloid in a small bottle with liquid acetone. Half fill the bottle or test-tube with chips and pour in acetone to about double the depth, otherwise the cement may be too stiff. Apply with a thin stick. Keep well corked, and away from a naked light.

Adapting Audio Transformers for the "Push-Pull"

A CORRESPONDENT to "Question and Answers" has asked how the ordinary audio transformers can be adapted to function in a push-pull arrangement. As a rule transformers having a split secondary are more expensive than the ordinary variety in which the secondary is not centre tapped, and an amateur desiring to try a push-pull arrangement for the last stage will welcome a few tips showing how it can be done, using ordinary transformers. Strictly speaking, the



following arrangement does not function in the same way as would a transformer having a centre tapping, but the output derived from this circuit can be considered as equal to twice that of each valve singly.

By studying the diagram it will be seen that across the secondary of the input transformer are connected two resistances joined in series, the centre join being used as the mid point of the secondary to which the grid bias is applied. The value of these resistances is not critical so long as they are of sufficient value to prevent any bypass of the higher frequencies. Two half-meg-ohm resisters are quite suitable.

Having provided the input arrangement, there still remains the output to be considered. In lieu of a centre tapped output transformer or choke, several methods avail themselves. Perhaps the simplest is the one shown in which two separate audio chokes are used, the centre connection being taken to B+ terminal. The speaker in this case is connected across these two chokes.

It is as well to mention here that the impedance across the entire output of a push-pull amplifier is doubled, and that unless a speaker having a fairly high impedance is used, a certain amount of energy loss will be entailed. A solution which suggests itself to the writer would be the adoption of a 2—1 ratio centre tapped output transformer for use with the average speaker. A more practical idea would be the use of two speakers connected in series, the centre connection taken to the centre connection of the chokes, in order to obtain better stability.

Where no output chokes or transformer is available, a good method can be adopted by connecting the two leads from a horn-type speaker, one to either plate terminal on the amplifier, and to use the connection between the two bobins on the speaker magnets, inside the unit, as the actual B+ connection. Thus one-half of the speaker is in the plate lead of one valve, the other half being in the plate lead of the other valve. This experiment should be tried only when a pair of small valves is used, as all the direct current is going through the fine wire of the speaker.

DX Notes

Station Identification

CAN any DX enthusiast (or maybe the owner of the station in question) identify station heard here at full R9 on late afternoon of June 23? The modulation could not be called excellent by any means. It was operating on the same wave-length as 2YB. It was rather too powerful and steady a transmission to be the effort of a budding "B class" owner without a license. No announcement was made between the items, only long intervals, and the sound of needles being changed. The mysterious station was listened to from approximately 4.50 p.m. to 5.50 p.m. At 4.50, in broad daylight, strength was R9. "Sunny Boy" was played no fewer than four times. Another item was "The Sky is the only Roof I Have."

I would like to congratulate "Fifteen-year-old," Gisborne, on his work on four valves. His circuit must be quite a reliable job. On three valves here I have logged, to date, 160 stations. Hoping someone knows something of the whereabouts of the station before-mentioned. I will be pleased to communicate with any of the DX enthusiasts on this or any other subject.—RONALD J. H. SCOTT, 506E Queen St., Hastings.

For Sale or Exchange.

See page 32 for column of casual advertisements.

Watch for the—

"RADIO RECORD"

Stall at the Exhibition.