and grid leaks correct, and do you have the right amount of bias on the valve? Does your set oscillate?

PHAR LAP (Napier): How can I set about lining the trimming condensers of my eight-valve commercial receiver?

A.: Without possessing special apparatus the best method would be to tune to a station at about the centre of the dial, say 1YA, then adjust the screws, commencing with one of those on the extreme. Move this in both directions, and note the effect on the volume. Leave it at the point of maximum sensitivity. If there is no change, return the screw to the position in which it was found. Repeat the process with the others.

2. Could you recommend a good book on the servicing of commercial receivers?

A.: Servicing of commercial receivers is a job beyond the amateur. Furthermore, it will not be long before interference with a commercial is prohibited by regulations. When a set loses sensitivity and the valves are still good, one should test for voltage on the screen, plate and grid of all the valves. Without this voltage test one more or less works in the dark and may do more harm than good. To test these voltages, special testing apparatus is necessary, and as the amateur rarely has this at his command we do not recommend interference with commercial sets, unless it is, of course, to trim up the condensers. Have you checked over your aerial and earth connections to make quite certain they are in order? Have you tested your rectifying valve? There are very few good books on the servicing of radio sets, unless it be Reyner's "Testing Radio Sets." He deals mainly with battery sets.

L. H. (Waikanae): I have been troubled with persistent crackling in the set, and have taken my whole outfit to a radio dealer, who says everything is alright. As soon as I instal it in my home the noise starts again.

A.: We cannot give you much help under these circumstances. We would imagine the fault to be within the set itself, probably due to a loose connection or to a defective resistance, which, although it did not show up in the test was, nevertheless, present, and taking the set to your home disturbed it again. It may be a broken down condenser in your power pack.

2. Where can I obtain an article on an Armstrong three-valve circuit?

A.: There are really dozens of Armstrong circuits, for Armstrong was the man who brought about the regenerative method of coupling. A regenerative circuit was shown in last week's "Radio Record," and used with the "Eagle Five" this week. A typical three-valve circuit was the "Ranger Three" described in the "Radio Record" some months ago.

E. C.S. (Rotorua): I added an extra valve to my three-valve set, leaving the power valve, which was in the last stage, in the set, and using a PM4. Is this correct?

A.: No; you should have taken the power valve from the last stage and employed a general purpose valve such as PM3 in what used to be the last socket, using PM4 in the last stage. By using the two power valves you are consuming far more battery current than you should. Furthermore, you are saturating the primary of the audio transformer between what used to be the last stage and the existing last stage. You may possibly burn it out.

2. What kind of speaker would be suitable?

A.: A light cone speaker.

UX (Te Kuiti): We do not have further particulars of the valves to which you refer. If we come across them, however, we shall notify you. From what we told you the other week you should be able to approximate the characteristics you require.

Laboratory Jottings

The G.M. Midget

WE have had the opportunity of testing a seven-valve General Motors Midget Super-heterodyne, and the following notes are based on that test.

The appearance of the set in a general way resembles that of most super-heterodynes in that it is very small and very compact. There are three controls, tuning, volume and tone. The tuning dial operates a low ratio dial graduated in kilocycles. It is of the circular pattern, an aperture in the set revealing an inch or so of the dial. A pointer indicates the frequency to which the set is tuned. We found that the frequencies indicated by the dial were within 5 per cent. of the frequencies on which the stations were operating.

In operating the set two things impressed us; in the first place the set was remarkably quiet, the noise level being reduced to a degree reminiscent of the older and generally considered quieter receivers. This has been accomplished by careful filtering on the mains side of the power transformer.

The second point was the unusual sensitivity (combined with the absence of noise).

We noted a slight difference in the relative strengths of stations received on either end of the dial. It appeared to us that, contrary to the usual, greater sensitivity was attained at the upper end of the dial.

A slightly greater number than the usual overseas stations was tuned in. Many small Australians were put on the speaker as well as several of the Japanese. It must be remembered, however, that a sensitivity test must be comparative only. In a different locality this set would undoubtedly bring in American and European stations when operated with a standard aerial and earth equipment.

The selectivity of the set is all that can be desired, our requirements being that under our own particular conditions a set should separate between 2YA, 2FC, and 4QG, and that, in doing so, it should not beat up any harmonics. Cross-modulation was entirely absent, and there were no artificial harmonics.

The tone of the set was good. It covered a wide range of frequencies, all grades of voice and music being as natural as we have heard on a set of this description. The tone control gave a nicely-graded tone, and we found that when worked more toward the bass end a most pleasing reproduction was obtained. The power output of the set was approximately 3½ watts, and when slightly less than one watt is all that is necessary for the average room, it will be realised that the set works with a great reserve of power.

The volume control is smooth and even, and satisfies our requirements—the toning down of 2YA without removing the aerial which comprises 120 feet erected at a height of 40 feet.