

THE term "motor-boating" is one which is rather aptly used in order to describe the peculiar and characteristic reiterated "put-put-putting" noise which is sometimes present during the operation of receivers which are worked in conjunction with a "B" battery eliminator.

#### A Common Fault.

PARTICULARLY is motor-boating liable to set in when the receiver contains a low-frequency amplification circuit of the resistance-coupled variety.

However, the bark of the trouble is, if it may be put so, worse than its bite, and with a little careful thought and modification of existing apparatus the amateur may generally rid himself of the trouble.

condensers require to be controlled with reasonable accuracy. If a set motor-boats, a condenser of some unsuitable value may have been included in the circuit—the capacity value of the condenser generally being on the low side.

Careful attention to the details of the set's construction in the above respects during the course of its building will nearly always result in the

## Silencing Motor-Boating

### A Type of Trouble Frequently Encountered

#### Further Tests Necessary.

IF it does, however, do not be content to let matters rest there, for the use of a grid leak of very low value may be detrimental to the reception. On this account, therefore, if other grid leaks are available try them out in place of the newly-added leak; until a value of leak which just brings back the motor-boating into the reception is obtained. The next lowest value of grid leak to this will constitute the best one for the purpose.

Difficult cases of motor-boating are often caused by an imperfectly-designed resistance in the resistance-coupled amplifying unit of the set. The usual value of the resistance used for this purpose is 100,000 ohms (.1 megohm). This value of resistance may be quite satisfactory for working with dry B batteries, but when it is used in conjunction with an eliminator, the latter may tend to supply an excess of current to the amplifying valve, and unless this is combated by the employment of

a higher resistance, motor-boating may set in.

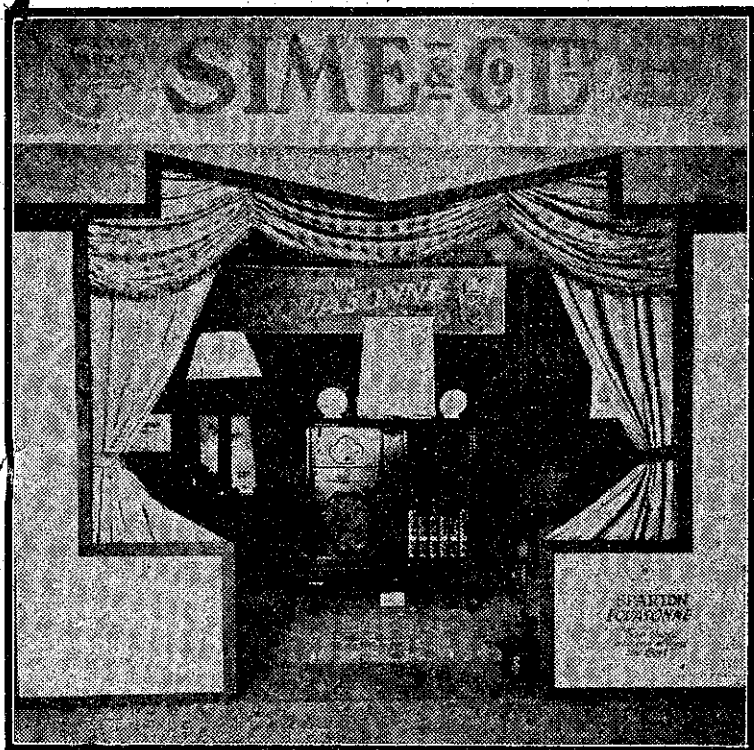
#### Effect of Current Leakage.

IF, therefore, the remedies suggested above fail in any case of motor-boating, it will be probable that the cause of the trouble will lie in this direction, particularly if it is found that the set works satisfactorily when used in conjunction with an ordinary B battery.

Of course, it must not be forgotten that any small imperfection in the fixed condensers in the amplifying circuit may set up the trouble. Motor-boating, for instance, may very well set in if one or more of the small condensers suffer a leakage of current. In every case of this trouble, therefore, it is advisable to test every condenser systematically.

Take each condenser and charge it up by placing it in contact with the poles of a single cell. After this, set aside the condenser on a sheet of glass or ebonite for a minute or so. Then connect the condenser across a pair of headphones.

At the moment of contact, a very distinct click should be heard in the phones, signifying that the condenser has been storing a charge and has given it up at the moment of contact. A condenser which will not store a charge in this manner should be regarded with grave suspicion, and, if (Concluded on page 26.)



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#### Many Causes.

IT is a difficult matter to ascribe the cause of motor-boating to one particular set of circumstances. The complaint may be due to many causes acting together. In general, however, it may be said that motor-boating is the result of the set's amplifier (particularly if it be a resistance-coupled amplifier) being more sensitive to low frequencies than to high frequencies.

Therefore, the traces of the alternating current hum which may, perhaps, escape the eliminator, are considerably amplified, and these, combining with the received modulations, of current, give rise to a periodic impulse of current, which, as we have said above, creates the "put-put-put" effect in the loudspeaker.

Motor-boating may be the result of the general ill-design and construction of a receiver, or, on the other hand, if may just be due to some particular component being unsuited to that particular circuit.

As an example, in resistance-coupled circuits which are employed with battery eliminators the values of the con-

finished receiver being quite free from the objectionable complaint.

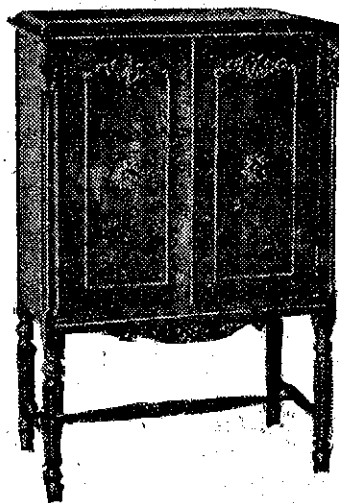
#### Finding a Cure.

ONE method of attacking the problem is to leave the set itself untouched, and to increase the capacity of the eliminator circuit. A 2 or 4-mfd. fixed condenser placed across the output terminals of the eliminator may mend matters.

If, however, the annoyance persists after this trial has been carried out, try reducing the resistance of the grid leak on the power valve. This can readily be effected without touching the existent grid leak on the circuit. All that has to be done is to connect the extra leak in parallel with the existing one.

The latter thereupon will be cut out of action, the current leakage taking place through the newly-added grid leak, which will be, of course, of lower resistance than the standard leak. A good value of grid leak to try out for this purpose is approximately .05 megohm. Very likely this treatment will succeed in eliminating the motor-boating completely.

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