

other power valve (603) in the second audio stage. There are 18 volts grid bias on the last valve.

A.: This is a very unsatisfactory arrangement. A 256 valve without bias is consuming about 20 milliamps, and the 603 biased at 18½ volts consumes 18 milliamps, resulting in a total draw for these two valves of 38 mas. This is far too great. A six-valve set using the correct valves rarely requires more than 30 milliamps altogether, so that under these circumstances the "B" batteries will run down very rapidly. The best method of controlling volume is to insert a high variable resistance between aerial and earth.

#### Screened Aerial.

"H. S." (Hunterville) states that he has erected an aerial attached to a galvanised wire which stretches between a tree and a hill half a mile apart, so that it lies just under the suspending wire. It is well insulated from it. He states that the results from this are not as good as the results from a smaller aerial of the usual type.

A.: There are three distinct effects due to the aerial being suspended to the galvanised wire:—

1.: This supporting wire is earthed, consequently the effective height of the aerial is a few inches.

## Train Telephones

### Canadian Invention

A FEW months hence the crack trains of the Canadian National Railways between Toronto and Montreal will be equipped with facilities allowing passengers two-way communication by long-distance telephone with any point on the North American continent.

The basis of the new application of the telephone lies in a combination of carrier current telegraphy and radio. The Canadian National Telegraphs have perfected a system of carrier current telegraphy, which now practically spans the Dominion. This system of telegraphy allows ten channels on each wire for message transmission. It was at one time called wired wireless, a confusing name. By means of the telegraph lines which run alongside the train tracks, it is now possible to talk from the moving train to any distant point.

The call is put through by the passenger in the same way that any long-distance call is given. The operator on the train calls the nearest exchange, his voice leaping by means of a powerful radio transmitter the short distance from the train to the telegraph wires. In fact, the radio transmitter is little more than a powerful amplifier as used on the carrier current system, which induces the electrical signal, which was the voice, into the nearby telegraph lines.

Since the carrier current system allows for voice transmission without interruption, the same results are obtained as over regular telephone lines. The call, once it has reached the telegraph wire, alongside the track, is picked up at the nearest exchange.

The operator there answers the train operator, for it all takes but a few seconds, and gets the number in the distant city. Then the procedure is like that of any telephone. It is also possible for a telephone subscriber to call up a train fitted with the apparatus.

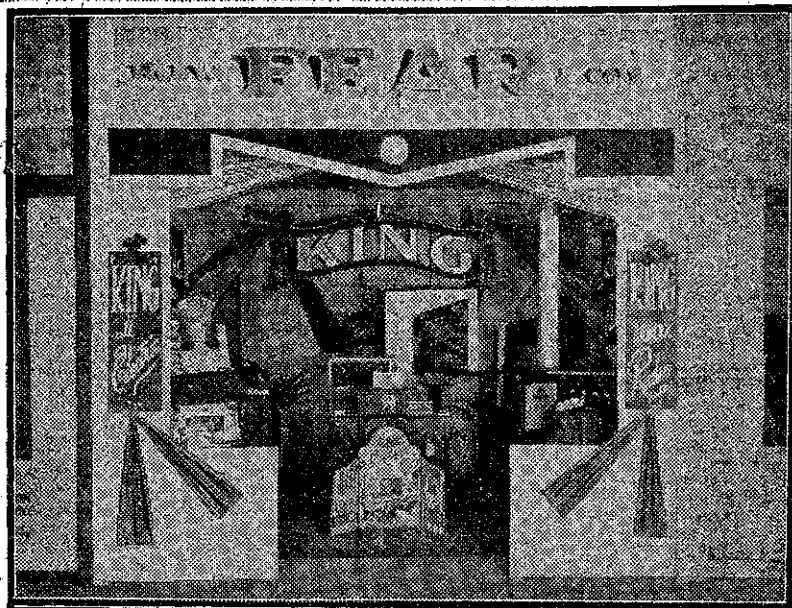
The Canadian National Railways will not attempt to control the use of the invention, which is to be made available to all railroads.

#### Use in England.

RAILWAY authorities in England are watching closely the developments which have taken place in Canada in connection with the application of wireless telephony to the needs of the business passenger. Their intention is to experiment with the innovation here in the light of the results which are being obtained overseas, and should present indications be fulfilled the day is not far distant when a passenger from Glasgow to London will be able to carry on his business during the journey through a telephone very similar to that on his own desk at home. The Dominion authorities have succeeded so far beyond their expectations, and are already planning telephone installations in a number of trains over short distances. Briefly, the procedure is the linking of the train telephone with a switchboard in a rear coach. The operator there inquires for the number in the usual way, and communicates with the nearest receiving station by wireless, the call in turn being passed through to the ordinary telephone exchange. Calls from "terra firma" to moving trains have also been put through satisfactorily by reversing the process.

#### For Sale or Exchange.

See page 32 for column of casual advertisements.



King Radio was featured on Messrs. Fear's stand at the Exhibition.

#### Screen Grid B.D.

"MARTON" wants to add a screen grid stage to his Browning-Drake.

A.: The correspondent would be unwise to interfere with his two R.F. Browning-Drake, as selectivity and sensitivity would likely be impaired. A screen grid booster could be tried, likewise the four-valve circuit which appeared in the "Listeners' Guide." In this latter case, two stages of radio frequency might follow the screen grid stage, but it is doubtful if the original two R.F. B.D. could be excelled by this arrangement. A diagram submitted by the correspondent is quite unsuitable.

#### In Brief.

"F. F." (Wanganui).—The "B" battery using test tubes was described in our issue July 29, and August 5, 1927.

#### Earth for A.C. Set.

"A. F.G." (Queenstown) has found that his A.C. set worked equally well with the aerial removed. He has tried all approved types of earth, and none are effective.

A.: As the set appears to be giving satisfaction it is apparent that it is earthing through the A.C. mains.

#### Trouble with a Long Aerial.

"A. F.P." (Blenheim) has an aerial 70 ft. high and 80 ft. long which does not give as good reception as a smaller one 120 ft. high and 20 ft. long.

A.: 150 ft. being the total length of aerial and lead-in is far too great, and maximum signals are no longer received. Noise is increased and selectivity spoiled. It is possible, too, that the small aerial was directional, while the slanting lead-in of the big aerial would offset any advantage obtained from this L type aerial.

2. The wire is acting as a screen and absorbing energy from the ether, leaving the aerial in a shadow.

3. There is a capacity effect between both wires decreasing the efficiency of the aerial.

## Storm Frequency?

### Curious Incident Reported

A CORRESPONDENT in North Auckland writes as follows concerning a very interesting phenomenon which he recently experienced:

"An incident that may interest the technical men occurred during the rebroadcast of 4QG by 2YA on Saturday evening. During the rebroadcast a south-westerly squall with rain passed over, and 4QG faded badly, so I immediately switched over to 2YA (5 degrees on dial). Imagine my surprise when nothing but a roar greeted me. On to 2FO (7 degrees)—all O.K., back to 4QG, weak but clear of interference—to 2YA, roar again, with talking just audible through the roar. After the squall everything was again normal. It would appear as though this disturbance had a definite wavelength close to 2YA's, as it gradually decreased either way. Actual dial readings: 4QG, 46; 2YA, 50; 2FO, 57.



G. G. Macquarrie featuring Steinitz at the Radio Exhibition.  
—Commercial Photographic Service Photo.