

A Mammoth Loud-speaker

Developed in America

A HUGE loudspeaker, deriving its power from a powerful air blast driven by an air-compressor, has been developed in America, for use in addressing outdoor gatherings. Mounted on a large truck, it brings radio programmes to a whole city.

Sitting in a sound-proof cab at the front of this moving sound projector, Frank Hetzel, the inventor, rode through the streets of New York City recently and spoke into a microphone. His voice was clearly understood by people thirty-five floors above him in the surrounding tall office buildings!

The device which enabled him to address the world in such stentorian tones is a powerful speech-amplifier unit, coupled to a new type of loud-speaker which imitates the action of the human throat and larynx, thus giving the same quality that enables a tenor to fill a large auditorium with a round, robust tone, yet without the least strain on the part of the singer.

Designers of the exponential type of loudspeaker are familiar with the fact that the action of the loud-speaker diaphragm sets up a standing wave in the horn, and that the horn must be quite long in order to compare favourably with the wavelength of the low bass notes. The action of the ordinary horn may indeed be compared to that of a man whispering.

The air, set in vibration by the vocal cords, transfers the sound through the throat and the mouth, and the quality of tone is controlled by the placement of the mouth and tongue.

But to produce a large robust tone capable of filling a large room, the words must be voiced—more air must be forced out by the pressure of the diaphragm, so that the air all about is set in motion.

This principle is the secret of this loudspeaker's huge volume. The air, set in motion by a powerful air compressor, is controlled by a set of "vocal cords," which impress upon the moving air column the vibrations of the sound impulses originating in the speech amplifier.

The sound is thus literally blown out of the loudspeaker, instead of merely setting up standing waves in the horn, and the resulting disturbance in the air carries over great distances.

The huge instrument, built at a cost of £3000, by Hetzel Brothers, automobile brake engineers, of Los Angeles, California, was intended for use in publicising their business. However, a flood of inquiries from interested business men make it seem probable that eventually the device will be commercialised.

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S-O-S

TRAVEL IN COMFORT BY
CAR

WELLINGTON — PALMERSTON
NEW PLYMOUTH

Pierce Earth System Effectiveness Questioned

A GREAT amount of attention has been focused on the Pierce earth lately. In fact, Mr. Pierce is quite a personality of importance in New Zealand radio matters. Many of the older readers will recall the first description of his earthing system published in our issue of March 30, 1928. Since that time it has been applied by numerous enthusiasts with varying results.

Following the publication of the original article there was such a wave of interest that the "Radio Record" sponsored a competition to find out if the earth was really having an effect on reception. The result has had its sequel in the recent DX competition, for the prize was won by Mr. Ellis, of Okato, who only last week carried off the DX Club honours and was accorded the position of DX king.

In his letter describing the improvement brought about by the system, Mr. Ellis remarked: "Before installing this earth I could get 2FC's carrier wave only at mid-day, and now I can bring it in quite clearly on the phones. I could not get an American station till I adopted this earth, and now they come in one after another when conditions are good." Mr. Ellis was allowed 69 American stations in the DX competition.

On the story of the original installation we shall not dwell. It will be sufficient to say that it was first used by an American enthusiast, Pierce, who achieved great results with it in the early days of radio. His experiences were published in many journals and aroused tremendous interest. Later measurements were made to justify or disprove the statements, and we shall refer to their findings later.

The essence of the system is shown in the accompanying illustration. Outside the window the wire from the set joins a binding post from which twelve wires lead to twelve pipes driven in the ground. Pierce said that each new pipe added to the volume, increased the selectivity and reduced the body capacity effect. So he added one after another. A leaky motor

radiator was sunk in the ground, at the end of the row of pipes, with its cap just above the surface of the earth, so that water could be poured into it. The ground clamps on the pipes were kept bright, and Pierce added that he put new ones on every few weeks.

That, in brief, is an account of the Pierce earth system. As we remarked earlier, many have tried it and found that reception improved. Others have probably installed it to no purpose.

We referred a few moments earlier to measurements. They showed fairly conclusively that a system of multiple earths was of little use unless the pipes were well separated. The following is an extract from a paper read before the American Bureau of Standards:—

"The diameter of the pipe employed for an earth tube is of no importance. Neither is it of any benefit to drive a number of pipes in close proximity.

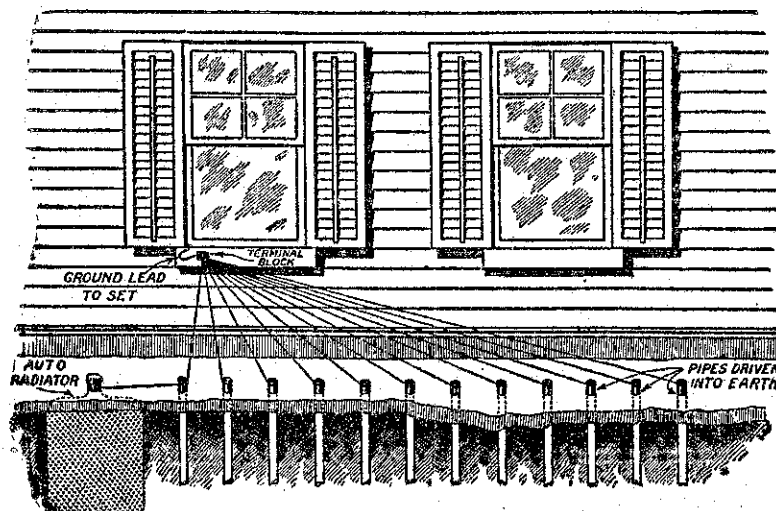
"If two or more pipes are driven 6 to 10 feet distant from one another, however, the resistance decreases almost in proportion to the number of pipes.

"This practice is only worth while, though, where an unusually low earth-contact resistance is required or where the soil is dry, sandy, or gravelly.

"The necessity for separating the two or more pipes forming the earth contact arises from the fact that the earth in immediate proximity to the first pipe driven is already carrying a dense current.

"If another pipe is driven into the field of this current, the immediately adjacent earth can obviously not pass appreciably more current and distribute it further afield. The second pipe must be driven outside the dense field from the first pipe, and it will then be able to play its proper part in the distribution of the current over a large cross-sectional area of the earth."

Here we are again, the old controversy of theory and practice. Let us reopen it. What do listeners think and what is their experience?



The Pierce Earth System.

Laboratory Jottings

The Jensen Speaker

MESSRS. Fear and Company have sent a concert model Jensen Dynamic Speaker for test. It is smaller and lighter than the usual dynamic speaker, but it is nevertheless thoroughly efficient. A ten-inch cone is employed, and this is fastened to a supporting ring of moulded one-piece construction. The flexible material allows for ample movement and yet holds the cone firmly. The centring device is of a design which is robust enough to stand up to fairly hard work without sagging to cause rattling.

The pot magnet has been reduced to very small dimensions on account of the new material being used. The model we tested was worked directly from the A.C. mains, and used with a 280 Arcturus rectifier. The concert model is designed for ordinary power output supplied by 245's single or in push-pull or in the Loftin-White. It supplies an undistorted output sufficient for the average large room, and might even be used in a very small hall, although it is not designed for this purpose.

Our tests were carried out with the Loftin-White amplifier and constant frequency records, the speaker being used behind a fairly large baffle. We found that the response from 75 to 7000 cycles was fairly constant—slightly more so than our standard. At the extremes there was a fairly sharp cut-off, but actually we could get notes of 45 and 8000 cycles through fairly clearly. Tested on ordinary records the added brilliance due to the strong treble reproduction was apparent. It is very pleasing after to find that this speaker reproduces music with some semblance of upper register fidelity. The speaker when used with a standard amplifier, such as we have previously mentioned can be relied upon to give really first-class reproduction.

This speaker has been used in quite a number of the American and British receivers we have tested.

Useful Hints

WHEN joining up a flexible wire to the terminal on the top of the bulb of a screened grid valve, remember that the thread on the nut should not be strained by tightening with pliers, as a good finger-tight connection is quite satisfactory.

DO not destroy the leaflets and instruction charts which you may get from time to time when purchasing components. Use a drawing-pin to hold them all inside the lid of the set, where they will always be easy to find and may prove invaluable if you decide to alter the circuit in some way.

WHEN a fixed condenser is connected in series with a variable condenser used for tuning, to reduce the tuning range, the law of the tuning scale will be altered and a "straight-line" condenser will be thrown out of the straight line condition by such a connection.