RADIO DIGEST

RADIATION FROM ANTENNAE OF VARIOUS SHAPES.

W. Burstyn.

The radiation characteristics are calculated for a number of types of antenna for all directions in space, and the ratio of the maximum to the mean radiation is determined. It is shown that an antenna of U-shape radiates with virtual equality in all directions under certain conditions, and that an antenna of spiral shape emits a rotating field.—*Abstracted from Jahrbuch der Drahtlosen Telegraphie, January*, 1919.

NAUEN EMPLOYS INGENIOUS DEVICE FOR TIME SIGNALLING

The operation is initiated by a single current pulse. This pulse actuates an electromagnet and sets a pendulum free. The pendulum in its swings causes a disk to rotate in jerks, following the swings of the pendulum. On the edge of the disk projections are provided that make a series of contacts by pressing against the tongue of a spring, and these contacts control the signals. After the series of time signals has been given in one revolution of the disk, a cam on the disk closes a second contact, which causes a second electromagnet to be energized. This electromagnet releases an armature that catches the pendulum and arrests it ready for its release for the first electromagnet at the succeeding time signal.—*Abstracted from Zeitschrift für Instrumentenkunde, January*, 1919.

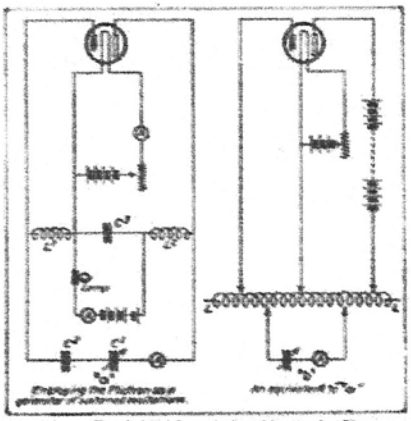
THE VERTICAL GROUNDED ANTENNA AS A GENERALIZED BESSEL'S ANTENNA.

By taking account of the variable distribution of inductance and capacity along a vertical grounded antenna the general expression for the current at any point of the antenna is obtained. For the case of an antenna having zero current at the top and maximum current at the (unloaded) bottom, the particular solution for current and voltage distribution is obtained.—*Abstracted from Proceedings Inst. Radio Eng., December*, 1918.

ELECTRON TUBE AS GENERATOR FOR MEASUREMENT PURPOSES

It is desirable in generating oscillations for measurement purposes that the amplitude and frequency of the generated current shall be constant and that the set-up shall be simple and flexible. By the latter term is meant that a wide range of wavelengths may be obtained with the same apparatus.

Constancy of amplitude and frequency are easily obtained. The main requirement being steadiness in the batteries supplying the filament heating current and the electron current between plate and filament. High-frequency current, constant both in magnitude and in frequency to better than



Here's a Real Hook-up for Your Audion as a Generator of Sustained Oscillations for Laboratory Measurement Purposes.

one-tenth of 1 per cent over long intervals of time, is readily obtained. When two or more tubes are operated in parallel on the same B battery changes occur in the intensity of the current furnished by one tube at the instant the second tube is put into operation or when the operation of the second tube is changed. Independent filament batteries should always be used.

A circuit which has shown itself to be convenient is shown in the drawing at A. Here the coils L_1 and L_2 may be wound in a single layer adjacent to each other on the same form. Taps may be brought out on each coil so as to use the number of turns desired. The condensers C_2 and C_3 are large fixed-value condensers which should be of low resistance. C_1 is the tuning condenser. A tungsten lamp is introduced in series with the B battery to protect the filament of the tube in case of an accident. The measuring circuit may be coupled directly to the coils L_1, L_2, or to a special coil of a few turns inserted in series with either of these coils, preferably on the side connected to the B battery since this point is held at constant potential by the large capacity of battery to ground.

The B battery may be inserted directly in the lead from the plate instead of adjacent to the filament as shown above. With such connection, however, care must be taken that there is very little capacity between the two batteries or their leads; if the batteries or their leads are not well separated and insulated from each other, the high-frequency current is much reduced. An advantage of locating the B battery adjacent to the plate is that a single continuous coil may provide all the inductances required in the circuits. Thus, as shown at b, connections may be made to the coil LL from filament, grid, plate, condenser, and high-frequency ammeter by movable contacts. Great latitude of adjustment of the several inductances is thus allowed, and the connections are very simply shifted from one type of circuit to another, so that the proper connections to give maximum current for any wavelength are made by simply sliding these contacts. An advantage of the mode of drawing the circuits shown at b is that it brings out that the several types of connections are equivalent.—*Circular of Bureau of Standards.*

THE LOOP AS A WIRELESS RECEIVER.

W. Burstyn.

The calculations show that the receiving power of a closed loop is approximately proportional to the third power of its linear dimensions and decreases with increasing wave length at a more rapid rate than in the case of an open receiver.—*Abstracted from Jahrbuch der Drahtlosen Telegraphie, January*, 1919.

Radio Vacuum-Tube Litigation is Settled

During the war litigation over rights for the manufacture and sale of vacuum-tube detectors for radio work was suspended by common consent, and tubes or "bulbs" for government use were made at various plants. As the situation stood at the close of hostilities an attractive market for bulbs was in prospect but patent rights prevented any one manufacturer from entering the field independently. The Marconi company held rights covering the use of a two-element bulb, Dr. De Forest's patents protected the use of the third element, and the Moorhead Laboratories in San Francisco had patented still other features also essential to the commercial production of the best tubes, among these being the use of a chemical process for exhausting air. During the war the Moorhead company had developed manufacturing facilities rapidly and bulbs were being turned out for the Allied governments at the rate of 30,000 per month.

Early in May representatives of the Marconi, De Forest and Moorhead companies held a conference in San Francisco and agreed that patent rights of all three should be extended to the Moorhead company, for which the latter should make payment to the other two on a royalty basis. In this connection it should be noted that this company is only permitted to make receiving and amplifying tubes, the Western Electric Company having the rights to manufacture the transmitting tubes. It was also agreed that the Marconi company would become the sole sales and distributing agent for the Moorhead output. The tube produced under this agreement is to be known as the Moorhead audion. Government contracts still operative will call for 15,000 bulbs per month, and within sixty days after the date of the contract the Marconi company, in the capacity of main distributing agent, is to receive bulbs at the rate of 50,000 per month.

DR. DE FOREST RECEIVES UNIVERSITY DEGREE.

Dr. De Forest, inventor of the audion vacuum tube, received from Syracuse University the degree of doctor of science.

IRON WIRE ANTENNA FOR TRANSATLANTIC RECEPTION

With a Marconi 118-A special receiver and a bank of seven French audions, we were able (in France) to hear Annapolis fifty feet from the receivers, and Lyons a half a block away, which is going some, considering that **our antenna consisted of two standard iron wires six hundred feet long, stretched between two small pine trees,** and that French audions in general are very poor in quality.

We heard all the principal arc stations in America, including NPL at San Diego, and the Bolsheviki at Moscow (MSK) came in like the old home town fire whistle. This latter station would register a space current change of from six to ten milliamps on the plate circuit of our receiver, and I think that is remarkable considering that it is 2,600 miles from Moscow to Bar-Sur-Aube, where we were located. Besides prior to this great war we had serious objections to the use of iron wire as a collector of passing hertzian waves.

G. M. Best, A.E.F.