

Jan. 31 1925

A REGENERATIVE

15 Cents

NEUTRODYNE FOR MORE DX

RADIO WORLD

Title Reg. U. S. Pat. Off.

*Radio Cross-Word
Puzzle*

*A 2-Tube Reflex That
Spanned U. S.*

*Trouble Shooting in
the Superdyne*

*Radio Trust Charge to
Be Heard March 18*

*Harry Snodgrass Freed;
"King of Ivories" Reforms*

The Radio Primer

*Answers to
Technical Questions*

Advance Programs

155-149
VOL. 6. NO. 19

ILLUSTRATED

EVERY WEEK



"THE CAT'S —"

The New Type 54

SLEEPER

MONOTROL

Reg. U. S. Pat. Off.

Grimes Inverse Duplex System

The only set that has 3 stages of tuned radio frequency ON ONE TUNING DIAL.

23 Other Important Improvements.

Write for booklet "W." It's FREE.

SLEEPER RADIO CORPORATION
434 Washington Street Long Island City, N. Y.

S. HAMMER RADIO CO.
303 Atkins Avenue, Brooklyn, N. Y.
Please send me FREE, Your NEW
RADIO CATALOG

Name
Address
City State
FILL OUT AND MAIL

WRITE FOR
NEW CATALOGUE
Home of Semi-Assembled Kits
THE RADIO SHACK
55 Vesey Street Dept. A-155 New York



Stations You Never Heard Before!

Know the joy of faultless reception. Control your grid up distortion; increase volume; get stations you never heard before. Resistance element constant, accurate. Unconditionally guaranteed.

Fits Standard Condensers
\$2.00
\$2.90 In Can.

FIL-KO-LEAK

SCIENTIFICALLY CORRECT
VARIABLE GRID LEAK
INDIVIDUALLY CALIBRATED

Resistance read in megohms through panel peep-hole or baseboard mounting. Get it at dealers—or Dept. R.W.-131.

DX Instrument Co., Harrisburg, Pa.

SOLVED!

—The "B" Battery Problem

Throw away your "B" Batteries and install a Kellogg Trans-B-former. It gives you "B" Battery current direct from your electric light socket at the trifling cost of one-fifth of a cent per hour. Gives better reception—no interferences. Write for details.

KELLOGG

SWITCHBOARD & SUPPLY CO.

Trans-B-Former

1066 WEST ADAMS STREET CHICAGO, ILLINOIS

RADIO WORLD'S S-U-P-E-R-D-Y-N-E EXPERTS SPECIALISTS

We have helped hundreds to success with RADIO WORLD hookups, especially SUPERDYNE—LET US HELP YOU. We are ready with kits and complete parts for BERNARD'S new 4-Tube SUPERDYNE, the premier circuit of 1925. All parts of highest quality—see our guarantee in past issues of RADIO WORLD.

OUR OWN LOW-LOSS COILS

Correctly wound to cover entire broadcast Range. A Laboratory development, after long experimentation, by our Engineers, which has produced a coil which is Low-Loss in every detail, price complete

\$7.50

(This coil is endorsed by Mr. Herman Bernard of RADIO WORLD.)

Bringing to Earth the Airplane Receiver

THE PRESSLEY SUPERHETERODYNE
The U. S. Army Airplane Set

COMPLETE SET OF SANGAMO RADIO FREQUENCY TRANSFORMERS

\$22.50

Complete parts for PRESSLEY SUPERHETERODYNE as specified and endorsed by POPULAR RADIO, including drilled and engraved panel and genuine mahogany cabinet

\$85

Complete parts for
BERNARD'S 4-TUBE SUPERDYNE
As Specified and checked over by Herman Bernard

One Superdyne Coupler	One Bradleystat
One Matched Radio-Frequency Transformer	One Bradley Push-Pull Battery Switch
One Bruno Ultra Vario Condenser No. 19	One 7x24" Black Radion Panel
Two 4" Black Accuratune Dials	One Tri-Jack (Or single-circuit jack)
One Federal No. 65 Audio-Frequency Transformer	Two Silver Eureka Dial Pointers
One Federal No. 65A Audio-Frequency Transformer	Two Lengths of Spaghetti
Four Federal Sockets	One Eby Terminal Block
One .00025 Mfd. Dubilier Grid Condenser	Wire, etc.
One Variable Bradleyleak	

\$42.50

WALLACE RADIO COMPANY, Inc. 135 LIBERTY STREET NEW YORK CITY

SUPERDYNE ADVICE FREE IF NOT LISTED ABOVE, WRITE FOR IT.

RESULTS GUARANTEED MAIL ORDERS SOLICITED

RADIO WORLD

[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879]

A Weekly Paper Published by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y. Phones: Lackawanna 6976 and 2063.

Vol. VI. No. 19. Whole No. 149.

January 31, 1925

15c per copy, \$6.00 a year

The Regenerative Neutrodyne

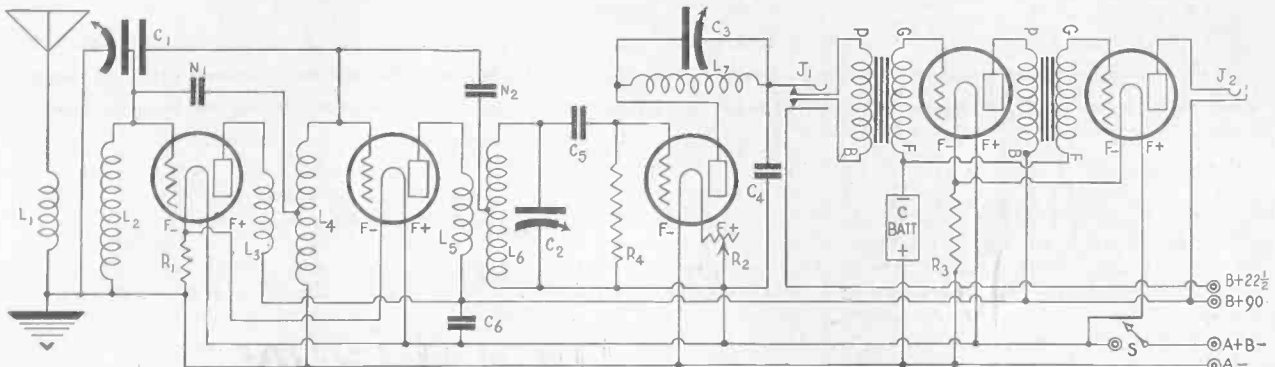


FIG. 1, the wiring diagram of the regenerative Neutrodyne. The introduction of regeneration greatly increases the DX powers of the Neutrodyne, having about the same effect as adding two more stages of tuned radio-frequency amplification. C1 is a variable condenser with one rotor (which goes to A-) and separate stators. One stator goes to the grid of the first tube, the other stator to the grid of the second tube. Thus the two RF stages are tuned with one motion and the set has only three controls, like the standard Neutrodyne, although regeneration is included. The Bureau of Standards successfully used a regenerative Neutrodyne. The wiring shows two balanced resistances, one controlling the two RF tubes, the other the two AF tubes, dispensing with two minor controls (rheostats). But in the detector stage a rheostat must be used. The tubes are 201A throughout. N1 and N2 are neutralizing condensers. L7 is a duolateral or honeycomb coil, tuned by a variable condenser, which should be regarded as C3 in following the textual wiring directions. L2 is tapped at each quarter turn for the last two turns, to facilitate getting just the right inductance, as it must be matched with L4. Also, L4, as L6, is tapped at the fifteenth turn from the filament end, for connection to the neutralizing condenser.

By Abner J. Gelula

REGENERATION in the detector plate circuit of the Neutrodyne increases the receiving range amazingly. It is like adding two more stages of radio-frequency amplification. The Bureau of Standards operated such a set with great success. There is nothing inconsistent about the combination of regeneration and neutralization, although many believe it cannot be done. A tuned plate Neutrodyne (Fig. 1), with an outdoor aerial, is as efficient as a Super-Heterodyne operated on a loop. Also selectivity, which sometimes is not all that may be expected of a Neutrodyne, is increased, though kept below that point where excessive selectivity spells distortion.

The set, properly made, will not radiate. The neutralization becomes a little more difficult with the introduction of regeneration and the tuning just a little harder; but the increased range and all-around efficiency well warrant that.

So that there will be only three controls, despite regeneration, one condenser is used to tune both radio-frequency stages. The plate is condenser-tuned, hence the set may be logged.

In a tuned radio-frequency receiver the oscillation will be terrific unless proper steps are taken to eliminate it. The neutralizing of the individual radio-frequency tubes solves this problem very nicely.

Radio-frequency cannot be depended upon always to increase the volume of the receiver. However, radio-frequency should increase sensitivity, and, on distance stations two stages of RF will be far more helpful than three or four stages of AF.

Regeneration increases volume, sensitivity and, to a very high degree, selectivity.

The plate coil is a duolateral, tuned by a .0005 (23-plate) mfd. variable in shunt. This coil should be a 75-turn inductance from which turns are removed until

the regeneration condenser tunes in step with the other .005 variable condenser, which is shunted across L6.

Only one rheostat is used. It is for the detector tube. The other tubes are controlled by balanced resistances (Amperites).

C1 is the split variable condenser of 44 plates. C2 and C3 are the .005 variable condensers. C4 and C6 are .001 mfd. fixed condensers. C5 is a .00025 grid condenser. N1 and N2 are the neutralizing condensers.

Neutralizing the Set

It is always difficult to neutralize any radio-frequency set. However, do not become discouraged if the set cannot be neutralized quickly.

To neutralize, get a station that is of medium strength. Place a small piece of paper on the one filament prong of the first RF tube. Place the tube back in the socket. The tube will not light, although the four remaining tubes will light. Do not turn off the rheostat. With a pencil or other long, thin object, slowly move the first neutrodon until the station is no longer heard, or until signal strength is at a minimum. Remove the paper from the filament and replace the tube. The set may yet oscillate. Repeat this process with the second RF tube, neutralizing this time with the other neutrodon. When signal strength is again at a minimum remove the paper and replace the tube. The set should no longer oscillate, i. e., whistle.

Neutralizing should be done while the set is tuned to a low wavelength, for if the set will not oscillate at low waves it certainly will not be troublesome at higher waves.

Wiring Directions

Wire the filaments first. From the negative A battery, extend a lead connecting one side to each of the two Amperites, R1 and R3, and direct to the negative side of the detector tube. The other side of R1 goes

Greater DX on the Neutrodyne

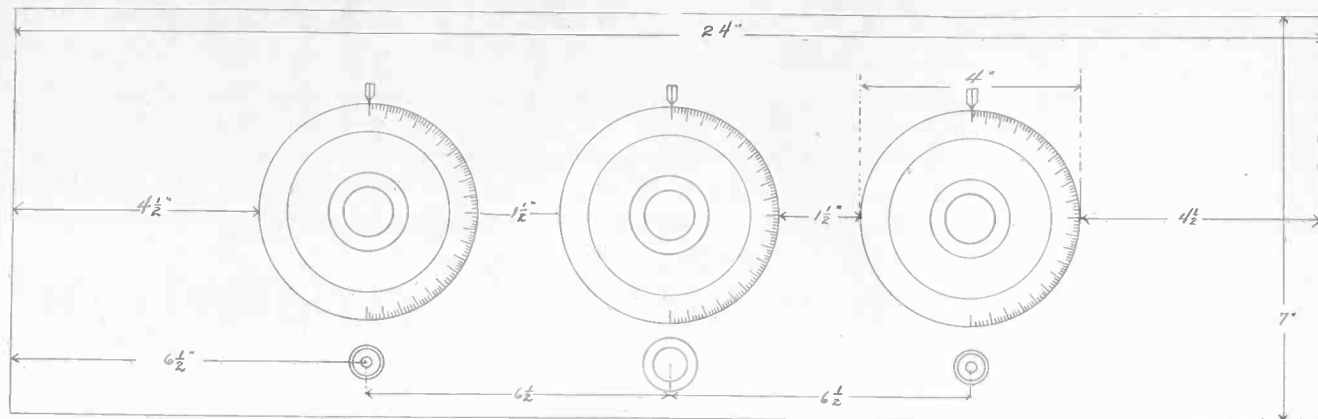


FIG. 2, the panel layout for the regenerative Neutrodyne. The dials are 4" in diameter. The detector jack is under the left-hand dial, which controls the split condenser. The rheostat is under the middle dial in center, which actuates the detector coupling coil's secondary. Under the right-hand dial is the jack for the audio output. The filament switch may be placed at the most convenient point, preferably in a front-and-back line with the A- post of the terminal block.

to the F- of the first and second sockets. The open side of R3 goes to F- of both audio sockets. The positive A battery terminal goes to the remaining filament posts of the two RF and two AF tubes and to one side of the rheostat R2. The other side of the rheostat goes to the remaining detector filament post (F+).

The aerial goes to the beginning of L1L2. The 8th turn tap goes to ground and A battery minus. The end of the coil goes to the grid of the first tube. Use the very end experimentally. Use 1/4-turn tap if necessary. The plate of the first tube goes to the beginning of L3, the end of L3 to the plus amplifier B battery (normally 90 volts). The beginning L4 goes to the grid of the second tube, the end of L4 to the A battery minus. The beginning of L5 goes to the plate of the second tube, the end of L5 to the positive B amplifier battery. The beginning of L6 goes to one side of the .00025 mfd. fixed grid condenser, and to the stator plates of C2 the other side of the fixed condenser to the grid post or G of the third tube. A leak is mounted from grid post to F+. The end of L6 connects to A battery+ and to the rotor of C2. The plate of the third tube goes to one side of the duolateral or honeycomb coil L7 and to the stator plates of C3, the other sides of C3 and L7 going to the spring leaf of the jack J1, the other or right-angle side of the jack to the positive detector B battery (normally 22 1/2 volts). One inside leaf of the jack

(connecting to the plate coil L7) goes to the P post of the primary of the first AF transformer. The remaining leaf goes to the other post, B, of the primary of the first AF transformer. The G on the secondary of the same audio frequency transformer goes to the grid of the fourth tube, the F to the negative C battery. The plate of the fourth tube goes to P on the second AFT, B of this AFT to the positive B amplifier battery. G on the secondary of this AFT goes to the grid of the fifth tube, F to the C battery minus. C+, connects to A battery minus. The plate of the last tube goes to one leaf of the jack, J2, the other leaf to the positive B amplifier battery.

The split variable condenser C1 is connected, rotor plates or rear post to A battery minus, the front and back posts on top respectively to the grids of the two RF tubes. These grid connections are to the grid sides of the neutralizing condensers. The inside posts on top of the variable condenser C1 are connected to their nearest corresponding outside posts.

Condenser C4 goes from the end of L7 to the A battery plus. The fixed condenser C6 connects, one side to the positive A battery, the other side to the positive B amplifier voltage.

One side of the neutralizing condenser N1 goes to the grid of the first tube, the other side to the 35th turn tap on coil L4. One side of N2 goes to the grid of the
(Concluded on page 23)

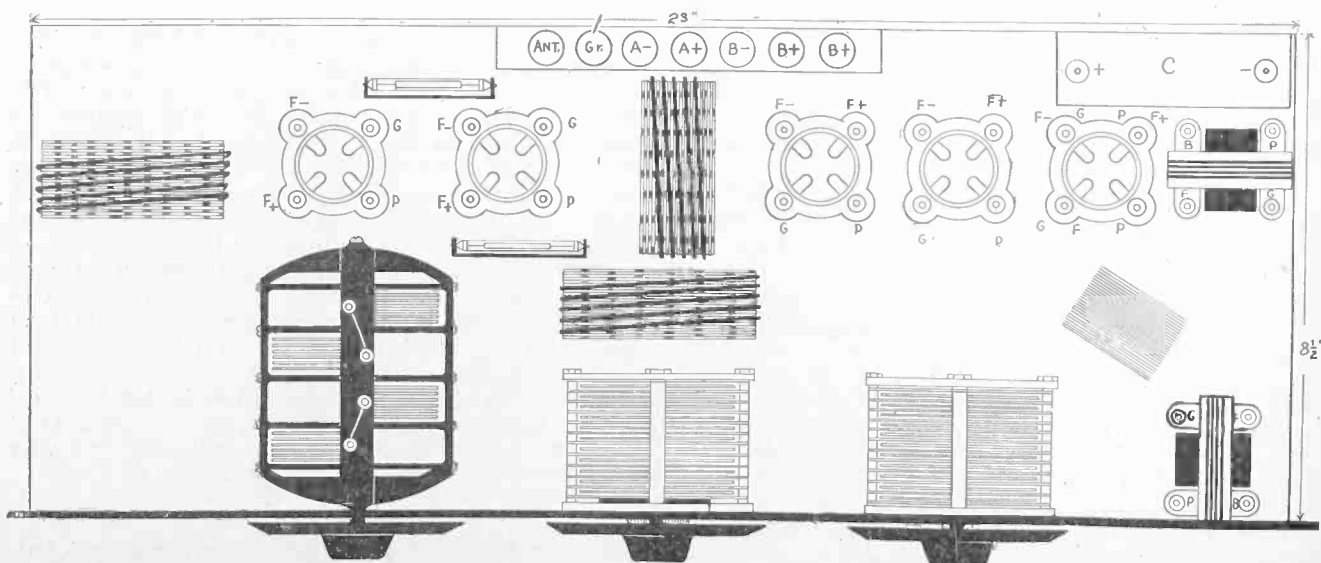
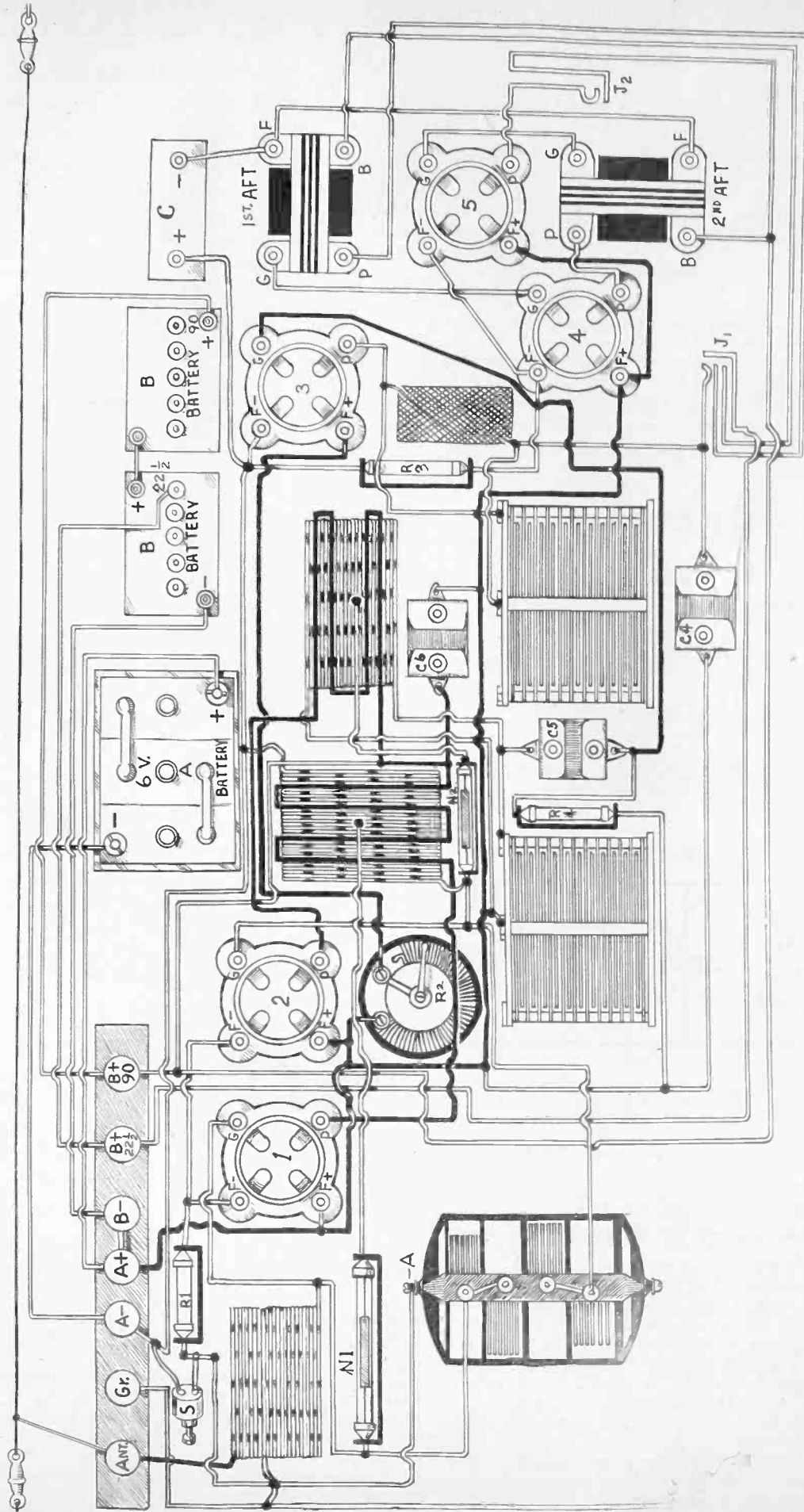


FIG. 3, assembly plan of the regenerative Neutrodyne. The duolateral coil is represented symbolically behind the variable condenser at right. The coil is mounted at an angle 71° respect to the panel as shown. A commercial coil, with its mount attached, may be used.

Picture Diagram of Neutrodyne Wiring



THE REGENERATIVE NEUTRODYNE (Fig. 4), showing the wiring asymmetrically. The schematic diagram is shown in Fig. 1. Those parts which might prove confusing to the novice are identified by the same designations for them that are used in the list of parts and in Fig. 1. Tube No. 1 is the first stage radio-frequency tube, at extreme left, Fig. 1. Tube No. 2 is the second RF tube. The detector tube is No.

3, while the two audio stage tubes are No. 4, first stage, No. 5, second stage. The audio-frequency transformers are numbered in respect to the stages they are connected to. The split condenser at left, the two other variable condensers next to it. R1 is a balanced resistance, as is R3. The rheostat is shown as R2. N1 and N2 are neutralizing condensers. Commercial products should be used. C5 is the grid con-

denser, R4 the grid leak. C4 and C6 are by-pass condensers. S is the switch interrupting A- or A+ lead. This diagram follows roughly the assembly plan, but should not be used as a guide for the placement of parts, but only for elucidation of the wired connections. The primaries of the two RF transformers are shown in black symbolically, although they are really white (DCC wire) and intertwined with the secondary.

Three Non-Radiating Circuits

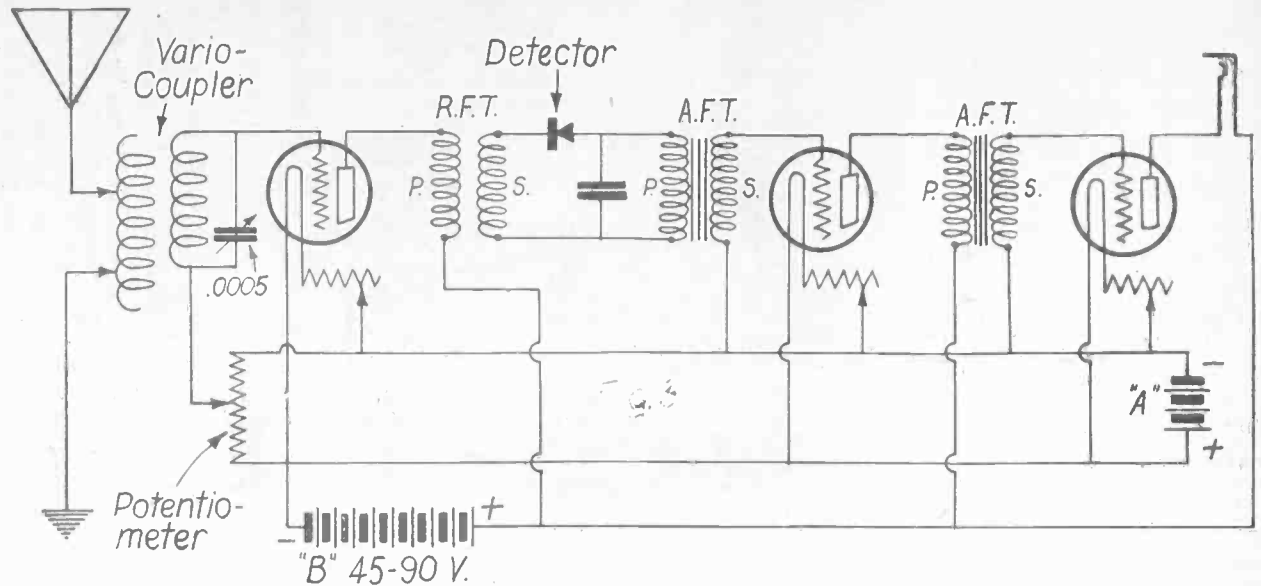


FIG. 1, wiring diagram of a stage of radio-frequency amplification ahead of a crystal detector, followed by two stages of transformer-coupled audio. This set will not work any DX wonders but will give signals of rare quality and delight and normally is good for consistent reception over distances of from 200 to 500 miles.

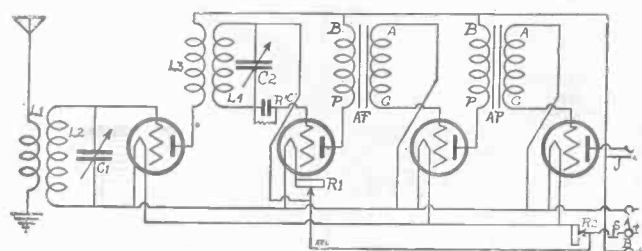


FIG. 4, another quality set, consisting of a stage of RF ahead of a tube detector, with two audio stages added.

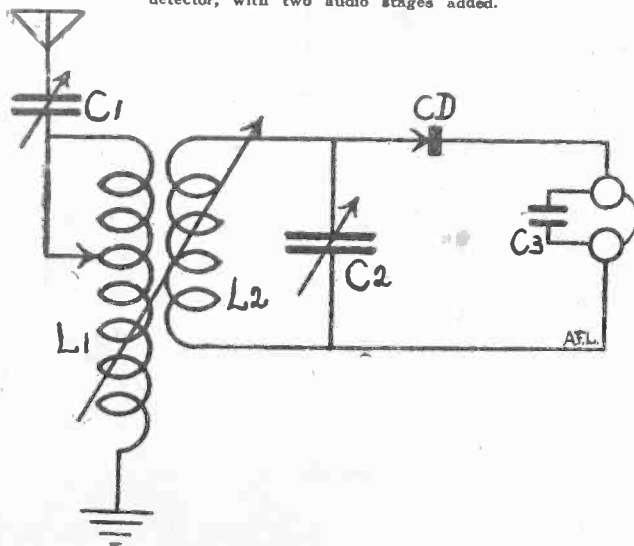


FIG. 5, a fairly selective crystal set.

By Herbert E. Hayden

A REAL quality set is shown in Fig. 1. Any standard variocoupler may be used. The coupler stator has taps at each turn for the first ten turns and these are connected to aerial through one tap-switch. The taps taken at every ten turns go to the ground switch. Fig. 2 shows how to connect the switch to avoid deadened losses. A terminal of the coil is joined to the movable arm of the switch (shown in b and c), not as shown in a. The RFT is a fixed radio-frequency transformer.

Quiet also attends tuning in the circuit shown in Fig. 3. This is like a Neutrodyne with only one RF stage, but normally needs no neutralization. A fairly selec-

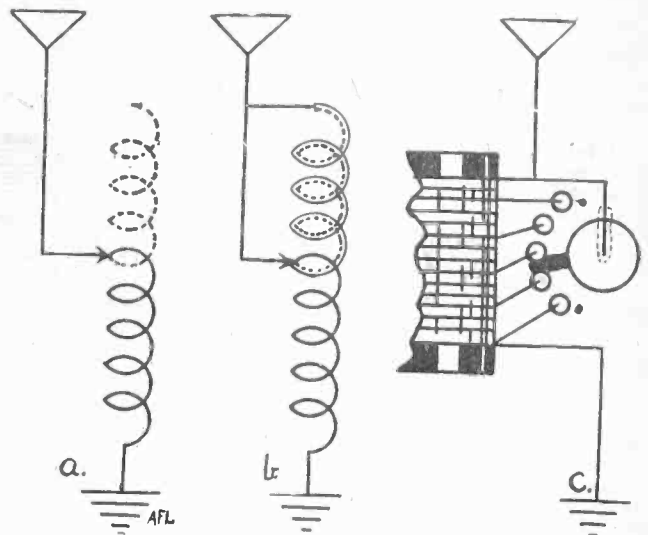
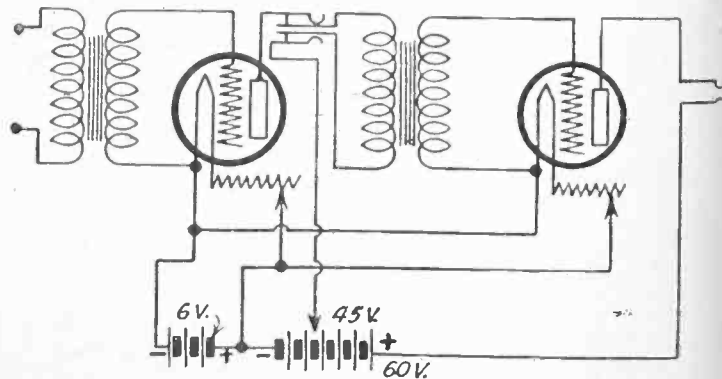


FIG. 2, how to connect the tap-switches to the stator of the coupler shown in Fig. 1.



(Fig. 3).

TWO stages of transformer-coupled audio that may be added to any detector circuit to give speaker volume. Added to a simple crystal detector, not preceded by an RF stage, the volume would not be sufficient, however.

tive crystal circuit (shown in Fig. 5) uses the same kind of variocoupler as the circuit in Fig. 1, but the aerial taps alone are taken. The variable condensers in all these circuits may be .0005 mfd., normally 23 plates, if the coils they tune have 31 turns of No. 22 wire on a 4" diameter tubing, or 42 turns on a 3" diameter tubing. The aperiodic primaries may consist of eight turns.

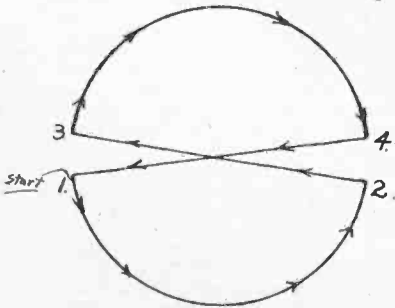
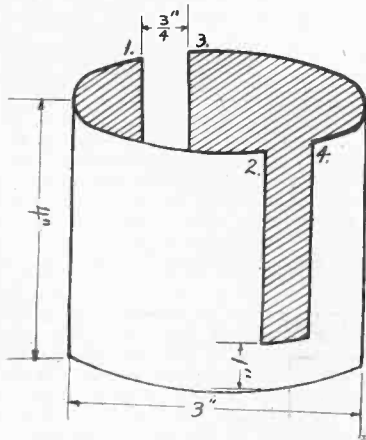
A Transcontinental 2-Tube Set

On a Good Night Almost Anything in the Country Can Be Tuned in Says the Author—Set Designed for Earphone Service

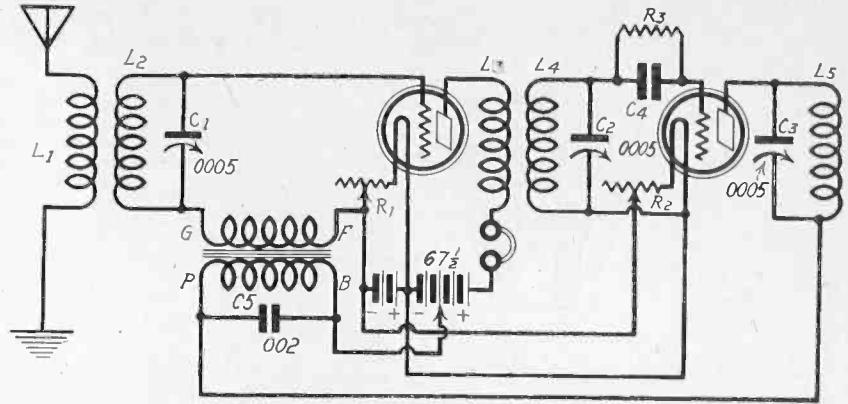
By H. E. Wright

THE principal difficulty experienced by most experimenters with reflex circuits is the tendency of the set to howl when the circuits are tuned to resonance. This is especially true when more than one tube is used. The cause of this howling is usually either incorrect capacities of the bypass condensers or unwanted feedback caused by stray magnetic fields. The latter is by far the more prevalent cause, but if instructions are carefully carried out it is entirely eliminated in the circuit presented herewith.

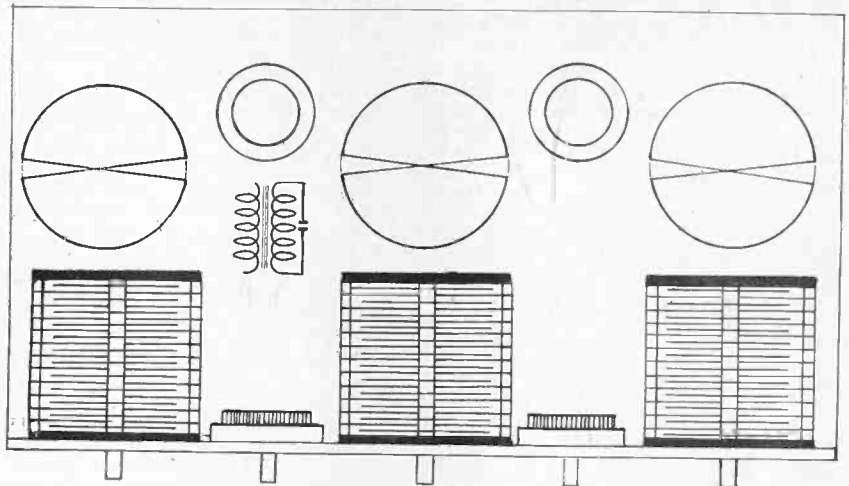
The coils used employ the so-called astatic windings which have a very concentrated magnetic field. A form is prepared by cutting slots in a cardboard tube to the dimensions shown in Fig. 1. Cut off fifteen feet of No. 24 DCC wire and anchor one end of it at the bottom of the form. Take the remainder of the wire on the spool and fasten one end of it at the bottom also. The two wires are then wound side by side on the form in the following manner. Referring to Fig. 2, say the start was made at point 1. The wires are then wound around the circumference of the tube until point 2 is reached. They are then passed through the slot diagonally over to point 3, then around the circumference of the



THE FORM or tubing (Fig. 1) on which the coils are wound is shown on top, the measurements given and the four corners numbered in accordance with the textual explanation of how to wind the special astatic coils. Three such forms are necessary, one for L1L2, one for L3L4 and one for L5. The lower diagram (Fig. 2) gives cumulative detail of the winding direction. The numbered corners correspond to those in Fig. 1.



CIRCUIT DIAGRAM (Fig. 4) of H. E. Wright's set that often gets KGO, Oakland, from his home in Baltimore. The coils have special astatic windings, easily made, as the author describes. The circuit consists of a stage of tuned radio-frequency amplification, tube detector and a stage of reflexed audio-frequency amplification. The RF transformers are L1L2 and L3L4. The impedance coil L5 produces regeneration in the detector circuit, hence the set has the reaching-out power of two stages of RF.



ASSEMBLY PLAN (Fig. 3) for Wright's set. The audio transformer is in front of the first socket. The primary of the AFT has the fixed condenser across it.

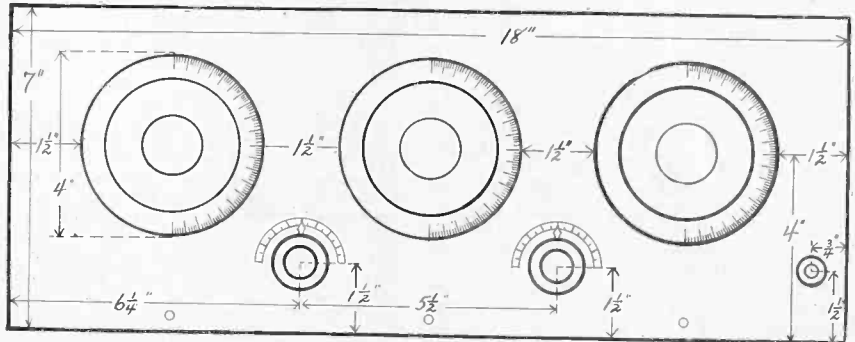


FIG. 5, panel arrangement for the 2-tube reflex.

tube to point 4, through the slot and over to point 1, thus making one complete turn. This sounds hard but is really very easy. Ten turns are made, but as there are two wires wound side by side there are really twenty turns on the form. The end of the primary is then brought down and fastened at the bottom. The secondary winding is continued until forty more turns are wound making fifty turns in all. The second radio-frequency transformer is wound in the same way except that twelve turns are wound on the primary. The coil L5 has fifty-five turns on it, wound the same as the other coils.

It is absolutely necessary that the positions of the coils in relation to one another be the same as that shown in Fig. 3. It is advisable that they be mounted as far apart as possible. Of course, it is

necessary that no grid and plate wires run parallel or close together.

When tuning the set C3 is set at zero and a station brought in by the simultaneous manipulation of C1 and C2. The volume can then be nearly doubled by turning C3. If C3 is turned too far, however, a great deal of distortion will occur. 199 tubes are used as it was found that they give the best results. The 201A type may be used, but they give mainly audio-frequency amplification and are not so good for DX. They also have a slight tendency to oscillate due to their large internal capacity.

One of the most remarkable features of this circuit is its wonderful volume on distant stations. On a good night almost anything in the country may be tuned in (Concluded on page 24)

Superdyne Trouble Shooting

For Radio World's 1925 Model

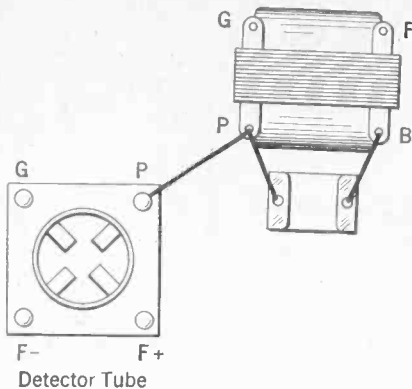


FIG. 1—A fixed condenser across the primary of the first audio transformer may increase volume. This is the connection meant when the loose expression "across the phones" is used in referring to a circuit that has audio stages.

[The article describing the construction of RADIO WORLD'S 4-Tube DX Superdyne, using only two controls instead of the usual three, was published in the issues of January 10, 17 and 24. It was fully illustrated, including a picture diagram of the wiring, as well as the schematic diagram and special illustrations of the filament and C battery connections. The following article deals with trouble-shooting in that circuit.—EDITOR.]

By Herman Bernard

THE 2-control Superdyne, 1925 model, is a selective circuit, but it is quite possible that some who build it will be at a loss to explain their own failure to obtain sufficient selectivity, especially on waves above 450 meters. In nearly every case this will be found due either to an oversized primary on the coupler or to failure to match up the secondaries of the tuning inductances. As only one variable condenser is used to tune both secondaries, L2 and L5, their values in

microhenries must be the same, otherwise a given dial setting will represent two different wavelengths. This will not prove so serious on the low waves, because their difference in kilocycles is so much less than the same dial difference between high waves on the upper numbers. In other words, one degree difference around 75 on the dial means a great deal, but around 20 it means considerably less. There is no reason, however, to tolerate a lack of selectivity.

Test the Secondaries First

If broad tuning is experienced, pay attention immediately to the secondaries. These may be matched without trouble or the use of laboratory instruments. Attach the aerial and ground to the respective terminals of the radio-frequency transformer primary, instead of putting the RF plate lead and the tickler at these points, then tune in a station, noting where stations above 450 meters come in best. This circuit may be tested with the loudspeaker connections intact. The other coupler connections are not disturbed.

There will be very broad tuning, for this is a simple audion detector circuit, with no regeneration in it. However, it will be easy enough to determine just

that point on the condenser dial where the stations come in strongest. Necessarily these stations must be locals, for the test hookup has no DX powers. Write down the condenser dial settings for the stations. It is amply sufficient if three stations are used for this test.

Now disconnect the radio-frequency transformer primary connections. Substitute the coupler. You do not have to remove the coupler from its position on the panel, nor move the RFT. Connect aerial and ground instead to the primary of the variocoupler. The grid and F-connections to the coupler have been left intact during the previous experiment, hence these connections stay as they were, but the detector tube plate is connected, instead of direct to the P post of the first audio-frequency transformer, to the one terminal of the coupler tickler, the other terminal of this rotor coil going to the vacant P post of the AFT. Now you have a regulation 3-circuit tuner. See where the stations are represented on the condenser dial setting. If you were troubled with broad tuning you will almost surely find a discrepancy in the dial settings. Normally it is to be expected that the hookup now under discussion will show higher dial readings. The difference may be slight, but if there is any visible difference at all you must eliminate it. For instance, if there is a variation of one degree for a given station, say 492 meters, that is a serious handicap, yet one easy to remedy. You may either add sufficient inductance to the coupler secondary or reduce the inductance value of the RFT. It is usually much easier to decrease the inductance on the RFT secondary, because to add turns to the coupler secondary would mean, in a way, there making of the coupler stator. To remedy the broad tuning difficulty some of the RFT's made commercially for this set have tapped secondaries. Therefore let us suppose that the RFT is to be adjusted. Note the dial readings on the condenser as it tunes the coupler secondary. These dial settings are to be your guide, for those of the coupling transformer are to be matched with them.

Adjusting the RFT

Now disconnect aerial and ground, putting these leads on the RFT primary, as before. The plate of the detector tube is connected to the P post of the first audio transformer. Therefore the tickler is disconnected from the circuit entirely, as is the primary of the coupler. Now you will get the same dial readings you got before when you tested the RFT as an aerial-grid tuner. Your dial readings will be lower than those obtained when the coupler was used. Therefore, to get higher dial readings, remove some of the inductance of the RFT secondary from the circuit. If a tapped secondary is used all you need do is to remove the connection that joins one condenser stator to the secondary, and place this connection to the secondary at a tap lower down, thus including fewer turns in secondary. If the difference in dial settings has been about 2 degrees, or a little less, it may be found that a tap taken $\frac{3}{4}$ of a turn from where the connection was made previously will bring in the stations at just the right dial settings. If not, keep experimenting until a unity of dial settings as between coupler and RFT is obtained. Then short-circuit the excess winding by connecting the tip of the excess to the tap previously selected.

The dial settings, of course, refer only to those for the variable condenser. The

tickler settings do not figure in the computation, although the tickler will be adjusted as each station is tuned in when the coupler is used, so that the maximum results are obtained, if such adjustment is necessary. It has been found that a given tickler setting often will be serviceable for a wide range of wavelengths. For instance, the setting for a 455-meter station may be used for all stations on higher waves, but a nice adjustment may be necessary for each station on the lower waves.

Once the secondaries are matched, as described, the broadness of tuning either will disappear entirely or will be nearly cured. If some broadness still remains, reduce the number of turns on the primary of the coupler. Just how many turns to remove from the primary can not be known without actual test. If you use a commercial model that has only four turns on it, then leave these turns intact, for it is scarcely possible to gain selectivity by reducing the number of turns below four. Also, the transfer of energy might not be at all what would be desired if a three or two-turn primary were used on the coupler. It is a fact, however, that the set will work well even if a one-turn primary is employed. The fewer the number of turns the greater the transformation or voltage step up. But there is a loss sustained in the diminished energy transfer that does not warrant the use of such a very meagre primary, if it can be avoided.

Now that the two secondaries are adjusted and the primary turns fixed at four to six turns, re-establish the circuit, with the coupler in the RF stage, which stage is coupled to the detector by means of the RFT. This is the circuit as it was before you started readjusting the coils.

The Grid Leak

If by this time the selectivity peak has not been reached, look to your variable gridleak. The resistance introduced into the circuit by the leak may tend to broaden tuning if that resistance is not exactly matched to the tube's requirements. If a UV200 or C300 tube is used in the detector circuit, as originally advised, this leak setting may be found to be somewhat critical. But once the correct leak value is determined it may remain fixed, for usually only in regenerative circuits is it necessary to monkey with the leak to clear up distant reception. However, when you get a distant station it is well to use this as a test for your leak resistance, setting it at the best operating point. Then it will be found that this setting is quite satisfactory for locals.

This exhausts the remedies for broad tuning, with the possible exception of the tickler setting. If the tickler is not properly set, in some sets it may be found that stations on the higher waves have a tendency to be audible over a couple of degrees of the condenser dial. But, if the tickler setting is correct for the stretch of wavelengths in which this station is included, then no such trouble will develop.

With these considerations carefully observed the set should be selective enough for all normal needs, which means sufficiently selective to tune out stations 15 meters apart, although they operate at 500 watts each and are more than three miles from the point of reception. Unless a set is selective it can not be expected to bring in DX, and this circuit, under actual test, proved its DX powers. For the specific object of determining possible causes of trouble coils were inserted im-

How to Increase the Volume In the 4-Tube DX Circuit

List of Parts for Superdyne

One certified Superdyne coupler (L1L2L3).

One certified matched radio-frequency transformer (L4L5).

One Bruno Ultra Vario Condenser, No. 19 (C1).

Two Federal (Nos. 65 and 65A) or two No. 3-A Stromberg-Carlson audio-frequency transformers.

Three UV201A tubes.

One UV200 tube.

Four Federal sockets.

One .00025 mfd. Dubilier grid condenser (C2).

One variable Bradleyleak (R2).

One Bradleystat (R1).

One Bradley push-pull battery switch (S).

One Tri-Jack or single-circuit jack (J).

One 120-ampere-hour Exide storage battery.

Two 45-volt Eveready B batteries (No. 1 and No. 2 in Fig. 1).

One 4½-volt Eveready C battery.

One 7x24" black Radion panel.

One mahogany cabinet, size to match.

Two silver Eureka dial pointers.

Two ¾" diameter hard rubber bushings.

Ten feet of vari-colored Columbia battery cable.

Two lengths of spaghetti.

No. 20 double cotton-covered wire or round bus bar for internal set wiring.

One pair of Tower's earphones.

One Western Electric loudspeaker.

One Eby terminal block.

100 feet 7-strand aerial wire, 50 feet No. 14 insulated lead-in wire, ground clamp, one double Fabnestock clip, screws, U-angle, right angles, two dozen solderless lugs, half-dozen Morsing union joints, ground clamp, lightning arrestor, hardware.

properly, leaks poorly adjusted, oversized primaries introduced, and other trouble causes introduced. There was trouble indeed, in those instances, but when the vices were remedied the set was restored to its original fine condition.

How to Get Volume

Next to lack of selectivity the greatest source of trouble in any circuit that works is lack of volume. Of course the Superdyne is noted for its volume as well as unexcelled quality, hence any deficiency along this line is not related to the circuit but to the details of its actual construction.

Sometimes the mere expedient of placing a fixed condenser of .001 or .002 mfd. (whichever you have handy) across the primary of the first audio transformer will remedy defective volume. This optional condenser should not be used unless necessary. No fixed condenser should be included in any circuit unless it is vital. Also, it will not increase volume where there is no defect in the circuit.

Test the Tubes

The main cause of volume absence are tubes. Experimenters often look to the tubes last, instead of first. This is often due to circumstances. They have just enough tubes to occupy the number of

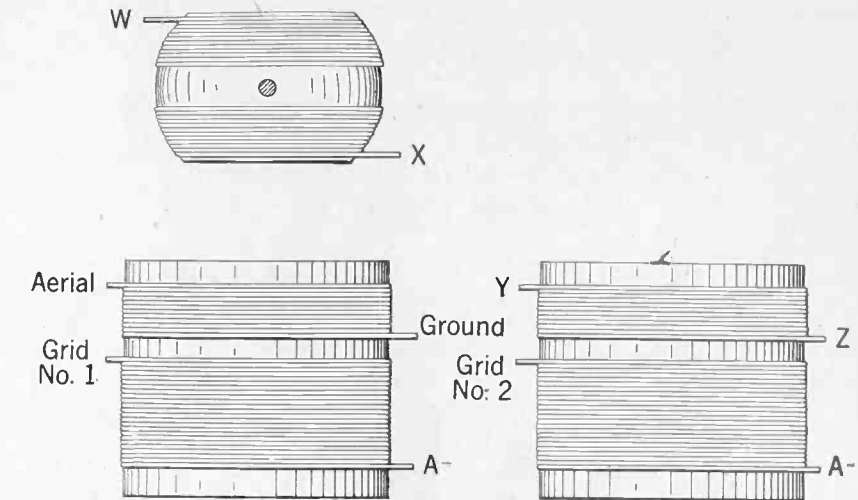


FIG. 2.—Showing the inductances used in RADIO WORLD'S 4-Tube DX Superdyne, 1925 Model, with terminals designated for simplification of connections. W is the beginning of the tickler or rotary coil of the coupler, X the end of that winding. It is X, not W, that is connected to the terminal Z of the radio-frequency transformer at right. Grid No. 1 refers to the connection to the grid of the first or radio-frequency tube. Notice that the ends of the two secondaries both go to minus A. This is because both coils are tuned by one condenser, which has a common rotor, going to A—, and two separate stators that go to the RF and detector grids.

sockets in the set, hence feel themselves limited in their tube tests. However, if phone tips are connected to the detector plate output and the B+ 22½ volts, then at least you will have a ready means of determining which of the three amplifying tubes is the best for the RF stage. That much done, the detector tube, the most frequent cause of volume loss, should be tested. Take one of the remaining two tubes, those now in the audio stages, and see if either of them works even nearly as well in the detector socket as did the 200 or 300 tube. If so your "soft" detector tube isn't functioning properly or is not a good detector. Vary its plate voltage. If you could borrow a similar soft detector tube that you know works splendidly in a friend's set, then compare it with your own, you would know the answer at once. Or, if that seems too presumptuous, take your detector tube to his house, and let him try out your tube and his. The answer would be the same in either case. If your detector tube isn't efficient you had better get a new one.

The Feedback Connections

Another possible source of trouble is in the connection of the leads in an attempt to get reverse feedback. The connections meant are those to the tickler coil. Confusion may exist in the minds of novices as to which is the beginning of a coil and which the end, and which beginning goes to which end or beginning, etc. However, even if the standard method of connecting the tickler is used, the set functions excellently, although the oscillations are not well controlled. The oscillations may cause the set to fail to function. The paradox—that the standard fashion works well, yet the set may not work at all that way—is explained by the fact that if the set works it will work well, but if the oscillations are fierce the signal may be blocked, in part or in toto. If the connections are properly made the tickler will control the oscillations of the radio-frequency tube. That is why it was safe to omit any rheostat in the amplifier tubes, for no RF tube can be successfully operated without some oscillation control. The audio tubes require none, however.

The connections may be made plainer by reference to Fig. 2. The aerial goes to the top terminal of the primary (L1).

The ground goes to the other primary terminal. These connections are so designated in Fig. 2. The terminal of the coupler secondary that is nearer the ground connection of the primary goes to the grid of the RF tube, the remaining terminal of the secondary, L2, going to F—. These directions refer only to a coupler mounted upright. The top of the coupler is that part in which most of the rotor turns. However, for shorter connections the coupler may have been mounted upside down. In that case the connections to the respective terminals are made, panel top to bottom, as follows: A—, grid of tube No. 1, ground and aerial.

The Tickler Connections

So far the tickler connections have not been considered. In Fig. 2 the beginning of the tickler is represented by W and the end by X. If the tickler can not be rotated completely around a circle, that is, has an end stop, then place the tickler so that its windings are parallel to those of the stator windings and, if the coil is mounted upright, the connections will be as shown in Fig. 2. If the coil is mounted upside down, then the right-hand terminal is the end of the tickler and the left-hand terminal the beginning. If the tickler rotates around the entire circle (which, by the way, represents only a 180-degree electrical variation) then it makes no difference in what order the tickler terminals are connected.

The radio-frequency transformer is represented by A at right in Fig. 2. The primary beginning is Y, the primary end Z. Thus, for a 90-degree coupler, connect the plate of the radio-frequency tube to Y and connect Z to the END of the (X). The remaining tickler terminal (W) goes to B+ amplifier voltage. If the connections still are not clear, it is safe to connect the end of L4, RFT primary, Z in Fig. 2, to either terminal of the tickler, the other tickler terminal to B+ amplifier voltage. Test. Reverse the tickler connections, noting which manner of joiner produces the better results.

Sometimes difficulty in stabilization is overcome by joining the A— to the ground. All other connections remain intact.

Limit on Number of Stations Planned by U.S.

See What the Waves Bring In



Class B Stations in Worse Tangle Than Ever, Due to Interference—New Channels Useless as Solution, Commerce Department Finds, as Applicants Swamp Bureau as Soon as New Waves Are Established.

WASHINGTON.

AN extremely critical stage in the re-allocation of wavelengths to class B broadcasting stations has been reached and developments may have a great effect on the public. Hope has been almost abandoned by the Radio Bureau of the Department of Commerce that any re-allocation plan for class B stations can be put into effect. Almost to the point where experiments with the reduction of separation between the wavelengths of stations were believed successful, the Radio Bureau has almost finally decided that the plan will not be put into general effect.

Complaints from radio supervisors, broadcasting stations and fans in all sections of the country of interference is responsible for the practical abandonment of the general allocation plan.

24 Stations Shifted

The wavelengths of nearly two dozen class B stations have already been changed. In cases where there are no complaints of interference the changes may become permanent. In other cases, additional changes will be made so that interference will not result.

The trouble, say officials of the Department of Commerce, is that there are too many broadcasting stations for the number of available channels.

"There is no use in trying to create new channels," said one authority. "Just as soon as one new channel is created, two new stations spring up. **We have reached a point where the only remedy seems to be the limitation of stations.**"

"I believe that if we could announce tomorrow that there would soon be available 100 new wavelengths for class B stations that inside of 48 hours we would hear of 200 new stations which would like to come on the air.

Many Ready to Start

"I believe there are quite a number of large companies right now which contemplate the erection of stations just as soon as there is room on the air for them."

Under the present law the Secretary of Commerce has not the authority to refuse a license to any station which meets the few requirements. Practically the only thing the Department of Commerce can do about it is to regulate the time each station may operate.

If the general reallocation plan is finally abandoned, as seems likely, the reduction between some stations will be made when interference will not result. This will accommodate a few of the new stations which will want to come on the air shortly.

The other new stations will be compelled to divide time three ways with stations already established.

DISCARDED LICENSES MUST BE SENT BACK TO RADIO BUREAU

WASHINGTON.
ANNOUNCEMENT has been made by the Radio Bureau that whenever radio stations are dismantled, their licenses must be forwarded to the Department of Commerce.

N. Y. Police Use Selective Call

A NEW installation, tried for the first time at the New York City Municipal Radio Broadcasting Station, WNYC, is expected to prove a valuable adjunct to the work of the police.

Engineers of the Western Electric Company successfully demonstrated a "selective" call to a single police station, followed by police instructions exclusively to that precinct. It also was demonstrated that the receiving set under test would not respond when other stations were called unless a borough call or a general call was issued.

How It Works

The system consists of the broadcast signalling attachment for the transmitter and the receiving equipment. The transmitting equipment includes a vacuum tube oscillator and a master selector key, capable of calling single stations, groups of stations or all stations at one time. The receiving equipment, to be located at about 200 police stations, booths and administrative offices in the five boroughs, has no exposed dials, but is tuned from within the cabinet, after which the cabinet is locked. This will prevent the receiving set being used for other than official business.

The make-up of the receiving set was worked out by Thomas W. Rochester, electrical engineer of the Department of Plant and Structures, and Michael R. Brennan, Superintendent of Police Telegraph.

Saves Time, Says Mills

William Wirt Mills, Commissioner of Plant and Structures, commenting upon the utility of the installation, said: "The saving in time and benefits to be derived in broadcasting such matters as major

accidents, thefts of automobiles, etc., will be far reaching. In the case of catastrophes, bulletins may be broadcast, including the lists of the dead and the disposition of the injured. This will prevent the jamming of the regular police telephone system due to the great number of inquiries after such accidents. The public may listen on their own receivers or go to the nearest police station and receive bulletins or obtain information relative to the injured, thus leaving the regular telephone system open for the transaction of routine work.

Message from U.S.S. Utah, with Pershing Aboard, Heard 4,600 Miles

WASHINGTON.

A TEST message sent by the Utah when south of Llanquihue, Chile, was picked up by the Rochester, in New York Harbor. The Utah was using a wavelength of around 2,500 meters. The distance was 4,600 miles. General Pershing is aboard the Utah.

SEVEN STATIONS CERTIFIED FOR FREQUENCY STANDARD

WASHINGTON.

SEVEN broadcasting stations whose transmitting waves were measured during December by the bureau of Standards were found to maintain a sufficiently constant frequency to be useful as frequency standards. These stations were WCAP, Washington; WRC, Washington; KDKA, Pittsburgh; WBZ, Springfield, Mass.; WGY, Schenectady, N. Y.; WSB, Atlanta, and WWJ, Detroit, Mich.

Radio Trade Monopoly Hearings Set for March 18

WASHINGTON.

THE Federal Trade Commission will begin taking testimony on March 18 at New York City on its complaint against the General Electric Co., American Telephone and Telegraph Company, Western Electric Company, Inc., Westinghouse Electric and Manufacturing Co., The International Radio Telegraph Company, United Fruit Company, Wireless Specialty Apparatus Company and Radio Corporation of America. The hearings will be conducted by Attorney Edward L. Smith of the Commission's staff.

Conspiracy Charged

The complaint charges that these companies "have combined and conspired for the purpose and with the effect of restraining competition and creating a monopoly in the manufacture, purchase and sale, in inter-state commerce, of radio devices and apparatus and other electrical devices and apparatus and in domestic and trans-oceanic radio communication and broadcasting."

The connection between the complaint and the request of Secretary Hoover that there be no radio legislation at the present time is indicated in this report of the Federal Trade Commission on its investigation of the patent situation at the request of Congress.

Why Laws Were Halted

The excerpt follows:

"The patents in the radio industry, which the commission was called upon to investigate by this resolution, were found to be controlled by a combination of a few great companies, as also commercial communications by radio. The commission since issuing the report has instituted proceedings against these companies. These facts are of vital importance in considering what legislation shall be now provided for the regulation of the radio industry."

NEW BROADCASTERS

WASHINGTON.

FOUR new class A and three new class B broadcasting stations were licensed by the Department of Commerce, while five class C stations were transferred to class A. The new stations follow:

CLASS A			
Call	Station	Meters	Watts
WABA	Lake Forest Univ., Lake Forest, Ill.	227	100
WBDC	Baxter Laundry Co., Grand Rapids, Mich.	256	50
WEBM	Radio Corp. of Am., Portable Mobile Station	226	100
WGBI	Frank S. Megargee, Scranton, Pa.	240	10

CLASS B			
Call	Station	Meters	Watts
WHA	Univ. of Wisconsin, Madison, Wis.	535.4	500
WEAR	Goodyear Tire & Rubber Co., Cleveland	389.4	1000
WHN	George Schubel, New York City	360.4	500

TRANSFERS

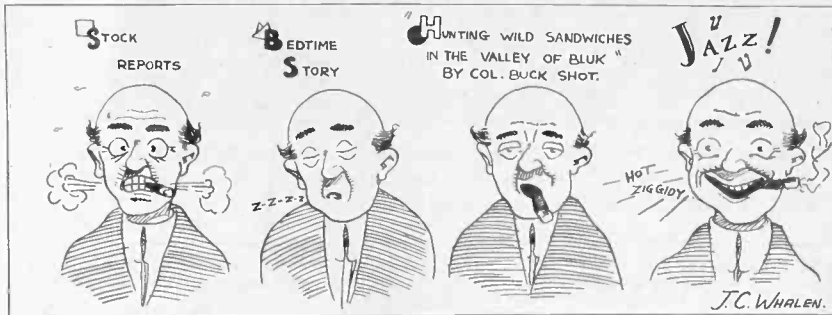
KFDJ	Oregon Agri. College, Corvallis, Ore.	254	50
KUO	Examiner Printing Co., San Francisco	246	150
WAAD	Ohio Mechanics Inst., Cincinnati, O.	258	25
WOAN	James D. Vaughan, Lawrenceburg, Tenn.	275	500
WOI	Iowa State College, Ames, Iowa	270	500

Editor, Radio World:—

UNDER "Latest Patents" on page 19 of the Jan. 3 issue you erroneously publish my address as Jackson, Mo.

WALTER G. CONGER,
1021 West College St.,
Independence, Mo.

A Facial Study in Program Preference



95% of Sets Used in Mexico Made in America

WASHINGTON.

THERE are four broadcasting stations of considerable size in Mexico, besides six smaller ones, Commercial Attache Alexander V. Dye, of Mexico City, reports to the Department of Commerce. Government license, regulations, and inspection is required for all receiving as well as sending stations. It is estimated that there are 20,000 receiving sets in Mexico City, and 12,000 more in other parts of the country, about 95 per cent of which are of American origin.

Tests of Radio Movies Planned by Jenkins

C. FRANCIS JENKINS, inventor, is planning to conduct tests in the near future of wireless transmission of motion pictures. He believes this will be one of the next stages in the development of wireless. The experiments are to be conducted in what he designates as "radio vision."

A small studio is to be rigged up in his laboratory, if plans materialize, in which will be dancing pantomimes and other movements for sending over the air. Receiving sets will be installed in a few homes to ascertain if the transmission is successful. These sets will consist of boxlike affairs which, when the lid is raised, will reveal a screen with the motion pictures cast thereon, the instrument being turned on in somewhat the same fashion as a radio program is found now.

Mr. Jenkins would venture no predictions as to the success of the tests, although he has forecast the possibility of such transmission of pictures.

Receivers in Britain Exceed 1,000,000

THE number of persons in Great Britain who have taken out wireless receiving licenses has passed the 1,000,000 mark and is growing steadily.

It is estimated that the actual number of listeners-in exceeds 4,000,000.

Landlords Seek Veto Right Over Aerials in New Leases

THE enthusiasm over radio that has swept the country has proved a source of annoyance to some building owners and managers due to installation of wires used in experimentation with receiving sets, says The Bulletin, published by the National Association of Building Owners and Managers.

To meet the situation, continues The Bulletin, Thomas P. Danahey of the Stott Realty Company of Detroit reports the preparation of a lease clause reading:

"That no electric or other wires for any purpose shall be installed in the premises except in a manner satisfactory to the landlord, and then only after written permission has been obtained.

"The tenant further covenants and agrees that no connections of any kind whatsoever shall be made by the tenant for any purpose or purposes whatsoever with the electric wiring now and hereafter installed by the landlord, or under its control, in the building in which said demised premises are located, nor shall the tenant construct, maintain, use or operate within said demised premises or on the outside of said building, any electrical device or apparatus in connection with a wireless telephone or telegraph sending or receiving station, or so-called radio device or system or for any other purpose or purposes whatsoever, except upon written consent first obtained from the landlord."

Pathe Broadcasts from Nine More Stations

IMPORTANT additions have been made by Pathe News to its nation-wide system of broadcast stations. At present nineteen stations have been lined up for the broadcasting twice each week of interesting radio talks based on current releases of Pathe News and thrilling exploits of Pathe News cameramen in gathering their news films.

Pathe's earliest announcement of its arrangements with important broadcast stations for the dissemination of these radio talks aroused widespread comment. The nine stations added since then are: WFL, Philadelphia; WGR, Buffalo; WGPA, Baltimore; WFAA, Dallas; WBT, Charlotte; KNJ, Los Angeles; KOA, Denver; KFPT, Salt Lake City, and KFEC, Portland, Ore.

Limit on Number of Stations Planned by U.S.

See What the Waves Bring In



Class B Stations in Worse Tangle Than Ever, Due to Interference—New Channels Useless as Solution, Commerce Department Finds, as Applicants Swamp Bureau as Soon as New Waves Are Established.

WASHINGTON.

AN extremely critical stage in the re-allocation of wavelengths to class B broadcasting stations has been reached and developments may have a great effect on the public. Hope has been almost abandoned by the Radio Bureau of the Department of Commerce that any re-allocation plan for class B stations can be put into effect. Almost to the point where experiments with the reduction of separation between the wavelengths of stations were believed successful, the Radio Bureau has almost finally decided that the plan will not be put into general effect.

Complaints from radio supervisors, broadcasting stations and fans in all sections of the country of interference is responsible for the practical abandonment of the general allocation plan.

24 Stations Shifted

The wavelengths of nearly two dozen class B stations have already been changed. In cases where there are no complaints of interference the changes may become permanent. In other cases, additional changes will be made so that interference will not result.

The trouble, say officials of the Department of Commerce, is that there are too many broadcasting stations for the number of available channels.

"There is no use in trying to create new channels," said one authority. "Just as soon as one new channel is created, two new stations spring up. **We have reached a point where the only remedy seems to be the limitation of stations.**"

"I believe that if we could announce tomorrow that there would soon be available 100 new wavelengths for class B stations that inside of 48 hours we would hear of 200 new stations which would like to come on the air.

Many Ready to Start

"I believe there are quite a number of large companies right now which contemplate the erection of stations just as soon as there is room on the air for them."

Under the present law the Secretary of Commerce has not the authority to refuse a license to any station which meets the few requirements. Practically the only thing the Department of Commerce can do about it is to regulate the time each station may operate.

If the general reallocation plan is finally abandoned, as seems likely, the reduction between some stations will be made when interference will not result. This will accommodate a few of the new stations which will want to come on the air shortly.

The other new stations will be compelled to divide time three ways with stations already established.

DISCARDED LICENSES MUST BE SENT BACK TO RADIO BUREAU

WASHINGTON.
ANNOUNCEMENT has been made by the Radio Bureau that whenever radio stations are dismantled, their licenses must be forwarded to the Department of Commerce.

N. Y. Police Use Selective Call

A NEW installation, tried for the first time at the New York City Municipal Radio Broadcasting Station, WNYC, is expected to prove a valuable adjunct to the work of the police.

Engineers of the Western Electric Company successfully demonstrated a "selective" call to a single police station, followed by police instructions exclusively to that precinct. It also was demonstrated that the receiving set under test would not respond when other stations were called unless a borough call or a general call was issued.

How It Works

The system consists of the broadcast signalling attachment for the transmitter and the receiving equipment. The transmitting equipment includes a vacuum tube oscillator and a master selector key, capable of calling single stations, groups of stations or all stations at one time. The receiving equipment, to be located at about 200 police stations, booths and administrative offices in the five boroughs, has no exposed dials, but is tuned from within the cabinet, after which the cabinet is locked. This will prevent the receiving set being used for other than official business.

The make-up of the receiving set was worked out by Thomas W. Rochester, electrical engineer of the Department of Plant and Structures, and Michael R. Brennan, Superintendent of Police Telegraph.

Saves Time, Says Mills

William Wirt Mills, Commissioner of Plant and Structures, commenting upon the utility of the installation, said: "The saving in time and benefits to be derived in broadcasting such matters as major

accidents, thefts of automobiles, etc., will be far reaching. In the case of catastrophes, bulletins may be broadcast, including the lists of the dead and the disposition of the injured. This will prevent the jamming of the regular police telephone system due to the great number of inquiries after such accidents. The public may listen on their own receivers or go to the nearest police station and receive bulletins or obtain information relative to the injured, thus leaving the regular telephone system open for the transaction of routine work.

Message from U.S.S. Utah, with Pershing Aboard, Heard 4,600 Miles

WASHINGTON.

A TEST message sent by the Utah when south of Llanquihue, Chile, was picked up by the Rochester, in New York Harbor. The Utah was using a wavelength of around 2,500 meters. The distance was 4,600 miles. General Pershing is aboard the Utah.

SEVEN STATIONS CERTIFIED FOR FREQUENCY STANDARD

WASHINGTON.

SEVEN broadcasting stations whose transmitting waves were measured during December by the bureau of Standards were found to maintain a sufficiently constant frequency to be useful as frequency standards. These stations were WCAP, Washington; WRC, Washington; KDKA, Pittsburgh; WBZ, Springfield, Mass.; WGY, Schenectady, N. Y.; WSB, Atlanta, and WWJ, Detroit, Mich.

Radio Trade Monopoly Hearings Set for March 18

WASHINGTON.

THE Federal Trade Commission will begin taking testimony on March 18 at New York City on its complaint against the General Electric Co., American Telephone and Telegraph Company, Western Electric Company, Inc., Westinghouse Electric and Manufacturing Co., The International Radio Telegraph Company, United Fruit Company, Wireless Specialty Apparatus Company and Radio Corporation of America. The hearings will be conducted by Attorney Edward L. Smith of the Commission's staff.

Conspiracy Charged

The complaint charges that these companies "have combined and conspired for the purpose and with the effect of restraining competition and creating a monopoly in the manufacture, purchase and sale, in inter-state commerce, of radio devices and apparatus and other electrical devices and apparatus and in domestic and trans-oceanic radio communication and broadcasting."

The connection between the complaint and the request of Secretary Hoover that there be no radio legislation at the present time is indicated in this report of the Federal Trade Commission on its investigation of the patent situation at the request of Congress.

Why Laws Were Halted

The excerpt follows:

"The patents in the radio industry, which the commission was called upon to investigate by this resolution, were found to be controlled by a combination of a few great companies, as also commercial communications by radio. The commission since issuing the report has instituted proceedings against these companies. These facts are of vital importance in considering what legislation shall be now provided for the regulation of the radio industry."

NEW BROADCASTERS

WASHINGTON.

FOUR new class A and three new class B broadcasting stations were licensed by the Department of Commerce, while five class C stations were transferred to class A. The new stations follow:

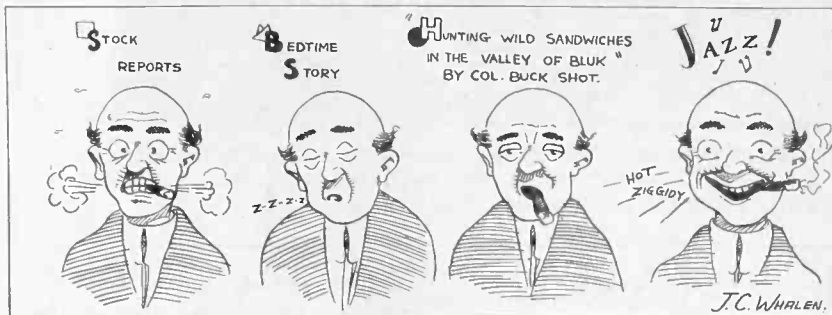
CLASS A			
Call	Station	Meters	Watts
WABA	Lake Forest Univ., Lake Forest, Ill.	227	100
WBDC	Baxter Laundry Co., Grand Rapids, Mich.	256	50
WEBM	Radio Corp. of Am., Portable Mobile Station	226	100
WGBI	Frank S. Megargee, Scranton, Pa.	240	10
CLASS B			
WHA	Univ. of Wisconsin, Madison, Wis.	535.4	500
WEAR	Goodyear Tire & Rubber Co., Cleveland	389.4	1000
WHN	George Schubel, New York City	360.4	500
TRANSFERS			
KFDJ	Oregon Agri. College, Corvallis, Ore.	254	50
KUO	Examiner Printing Co., San Francisco	246	150
WAAD	Ohio Mechanics Inst., Cincinnati, O.	258	25
WOAN	James D. Vaughan, Lawrenceburg, Tenn.	275	500
WOI	Iowa State College, Ames, Iowa	270	500

Editor, Radio World:—

UNDER "Latest Patents" on page 19 of the Jan. 3 issue you erroneously publish my address as Jackson, Mo.

WALTER G. CONGER,
1021 West College St.,
Independence, Mo.

A Facial Study in Program Preference



95% of Sets Used in Mexico Made in America

WASHINGTON.

THERE are four broadcasting stations of considerable size in Mexico, besides six smaller ones, Commercial Attache Alexander V. Dye, of Mexico City, reports to the Department of Commerce. Government license, regulations, and inspection is required for all receiving as well as sending stations. It is estimated that there are 20,000 receiving sets in Mexico City, and 12,000 more in other parts of the country, about 95 per cent of which are of American origin.

Tests of Radio Movies Planned by Jenkins

C. FRANCIS JENKINS, inventor, is planning to conduct tests in the near future of wireless transmission of motion pictures. He believes this will be one of the next stages in the development of wireless. The experiments are to be conducted in what he designates as "radio vision."

A small studio is to be rigged up in his laboratory, if plans materialize, in which will be dancing pantomimes and other movements for sending over the air. Receiving sets will be installed in a few homes to ascertain if the transmission is successful. These sets will consist of boxlike affairs which, when the lid is raised, will reveal a screen with the motion pictures cast thereon, the instrument being turned on in somewhat the same fashion as a radio program is found now.

Mr. Jenkins would venture no predictions as to the success of the tests, although he has forecast the possibility of such transmission of pictures.

Receivers in Britain Exceed 1,000,000

THE number of persons in Great Britain who have taken out wireless receiving licenses has passed the 1,000,000 mark and is growing steadily.

It is estimated that the actual number of listeners-in exceeds 4,000,000.

Landlords Seek Veto Right Over Aerials in New Leases

THE enthusiasm over radio that has swept the country has proved a source of annoyance to some building owners and managers due to installation of wires used in experimentation with receiving sets, says The Bulletin, published by the National Association of Building Owners and Managers.

To meet the situation, continues The Bulletin, Thomas P. Danahey of the Stott Realty Company of Detroit reports the preparation of a lease clause reading:

"That no electric or other wires for any purpose shall be installed in the premises except in a manner satisfactory to the landlord, and then only after written permission has been obtained.

"The tenant further covenants and agrees that no connections of any kind whatsoever shall be made by the tenant for any purpose or purposes whatsoever with the electric wiring now and hereafter installed by the landlord, or under its control, in the building in which said demised premises are located, nor shall the tenant construct, maintain, use or operate within said demised premises or on the outside of said building, any electrical device or apparatus in connection with a wireless telephone or telegraph sending or receiving station, or so-called radio device or system or for any other purpose or purposes whatsoever, except upon written consent first obtained from the landlord."

Pathe Broadcasts from Nine More Stations

IMPORTANT additions have been made by Pathe News to its nation-wide system of broadcast stations. At present nineteen stations have been lined up for the broadcasting twice each week of interesting radio talks based on current releases of Pathe News and thrilling exploits of Pathe News cameramen in gathering their news films.

Pathe's earliest announcement of its arrangements with important broadcast stations for the dissemination of these radio talks aroused widespread comment. The nine stations added since then are: WFL, Philadelphia; WGR, Buffalo; WGPA, Baltimore; WFAA, Dallas; WBT, Charlotte; KNJ, Los Angeles; KOA, Denver; KFPT, Salt Lake City, and KFEC, Portland, Ore.

Stage of Tuned RF Ahead of the 3-Circuit Tuner

The Radio University



Question and Answer Department conducted by RADIO WORLD for its Readers by its Staff of Experts. Address Letters to The Radio University, RADIO WORLD, 1493 Broadway, New York City.

PLEASE show a circuit with a stage of tuned RF ahead of the 3-circuit tuner you can log.—Frank Casey, 10145 116th Street, Richmond Hill, N. Y.

The circuit is shown herewith (Fig. 80). L2 is a 75-turn duolateral or honeycomb coil from which twelve turns are removed. The excess wire is

whistling and distortion. How can I remedy this?—A. Candy, 498 Lansdowne Ave., Toronto, Ont., Canada.

See that all coils are wound in the same direction, that your aerial ground system is good. Test your tubes in another set. Use the rheostat to help clear up DX; also use variable leak.

be retained, instead of the two in the 1925 model, you can use a positive grid return on the detector. See issues of November 22 and 24.

WHAT kind of outdoor aerial will improve the selectivity of the Radiola VI?—W. C. Perrault, St. Martinville, La.

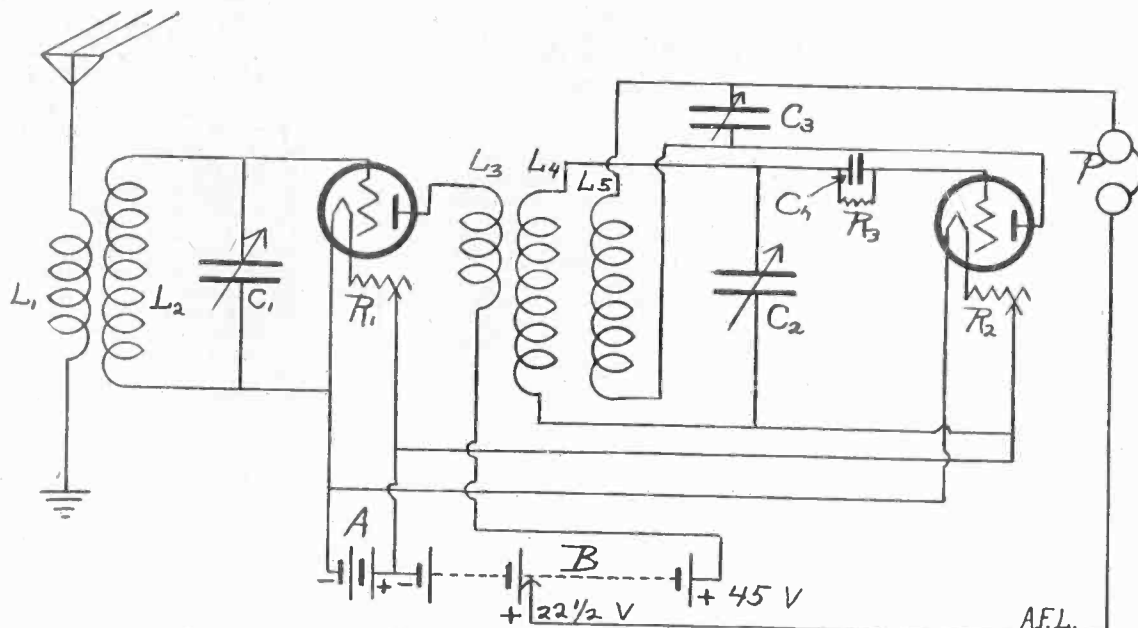
A 30-ft. aerial well insulated direct into the set, the ground of a cold water pipe direct into the set, a 50-turn honeycomb across the aerial and ground.

HOW can I change the three honeycomb coil set into a Superdyne?—H. Dubin, Girard, Ill. The three honeycomb coils will constitute the primary, secondary and tickler of the Superdyne. The plate coil is a 50-turn HC tuned by a .0005 mfd. variable condenser.

HOW would you compare the Inverse Duplex, the tuned radio-frequency and the regenerative radio-frequency sets?—J. G. Hagen, Schaeffer, N. D.

Preference depends on demands of your location and how much you are willing to spend; also personal tastes; hence no definite answer is possible.

CAN the Erla AF Transformer, 6-to-1 ratio and 3 3/4-to-1 ratio, and the Erla RF Transformers, No. 1 and 2, be used in the Caldwell Reflex as



A STAGE of radio-frequency amplification ahead of the 3-circuit tuner. This set can be logged. Duolateral or honeycomb coils may be used. C1, C2 and C3 are .0005 mfd. variable condensers. This set has great DX powers (Fig. 80).

wound on a form smaller than the interior diameter of the honeycomb coil, such as a small vaseline bottle. Then it is removed from this form and, after it springs apart a little, is reduced by taking in the slack. The terminals are used to secure the wire, which, when bunched, is forced inside the other coil. The new winding is L1. L3 is similar. L4 corresponds to L2. L5 is a 50-turn honeycomb in fixed inductive relationship to L3L4. R1 and R2 are 6-ohm rheostats for 201A, 301A, 11 or 12 type tubes. For 199 or 299 use 35-ohm rheostats.

WILL you kindly tell me how the tickler should be mounted to be in inductive relationship to the secondary coil?—L. M. Duncan, 1208 W. 18th St., Indianapolis, Ind.

When both the windings of the primary and the windings of the secondary are running in the same direction, regeneration is at maximum. When the tickler coil is at right angles to the secondary, regeneration is at minimum. The tickler coil may be mounted at any point in inductive relationship to the secondary, but not more than 2" away from the newest point of the secondary.

COULD I place a jack in the detector tube output of the 1925 model Superdyne for good results on the phones? (2) Would anything be gained by using a separate rheostat for the RF tube?—Henry Westermeyer, Cleveland, Wis. (1) Yes. (2) No. The tickler provides sufficient control of the RF tube.

I GET locals on my 3-circuit set but music from distant stations is accompanied by lots of

whistling and distortion. How can I remedy this?—N. Eastman, Birmingham, Ala.

At 60 meters you will find it very difficult to check oscillations. However, wind 4 turns for the aperiodic primaries, 20 turns for the secondaries. The variable condensers should be not larger than 13 plates.

I HAVE a 5-tube Neutrodyne which does not give sufficient volume. Can you tell me anything that will increase the volume?—Elmer E. Bittinger, Springs, Pa.

Increase B battery to 90 volts. Look to aerial and ground for possible improvement. Put a .001 fixed condenser across the first AFT primary.

KINDLY tell me if a coil wound on tubing using standard copper would be as efficient as one wound with Litz?—G. Brady, 157 Court St., Brooklyn, N. Y.

Litz is not as efficient on low-wave lengths as standard copper.

IN reference to the 5-tube Reflex set described in the issue of December 6: Can I place a jack in the detector output and first stage output to cut down volume?—Mark S. Steigener, 402 E. Horter St., Mt. Airy, Pa. Yes.

HOW can I change the standard Superdyne to RADIO WORLD'S 1925 Superdyne?—Peter Deihle, 540 E. 84th St., New York City.

Over the plate coil wind six turns of No. 20 DCC wire. This will constitute your radio-frequency transformer. If three controls are to

be retained, instead of the two in the 1925 model, you can use a positive grid return on the detector. See issues of November 22 and 24.

What kind of outdoor aerial will improve the selectivity of the Radiola VI?—Olof Wallin, Swea City, Iowa.

Yes.

I HAVE a frying noise in my set, a good deal like a bad B battery. It is especially noticeable when I get a signal tuned in. At other times this noise is hardly noticeable. I have gone over all my connections, inspected my aerial, tested my AF transformer Band A batteries, and all are O. K. It cannot be atmospheric disturbances, as the noise persists when the aerial and ground are disconnected.—H. V. Ellis, Prior and Minnehaha Sts., St. Paul, Minnesota.

The entire trouble probably is your B battery. The B battery may test O. K., yet there may be a loose connection inside the cell. Try a new set of B batteries.

MY SET will not tune under 250 meters. I should like to get down to 200. How can I do it? (2) How can I stop the stations from squealing on low wave lengths? (3) Would the fact that the radio-frequency transformers are too close together cause it to squeal? (4) I have heard 110 stations, three of which are in Canada—one in Porto Rico, seven in California, eight in Mexico City. Would you say these are good results?—Dale Rigby, Wilmer, Texas. (1) Your aerial should be no longer than 75 ft. Take off approximately 8 turns from the secondary coil. (2) You may stop the squealing by shielding the transformers. (3) Yes. (4) Yes.

IN reference to the Superflex, does it matter whether the tickler or the large coil is nearer

How to Erect a Counterpoise Aerial System on Roof

the panel? (2) Can you tell me why when my hand goes near the left dial a squeal results? (3) How far away should the tickler coil be from the RF coil? (4) Can you suggest anything that I should do for better results?—Frank Patton, Jr., 3809 N. Hampshire Ave., N. W. Washington, D. C.

(1) It makes no difference in results. (2) The rotor plates of the variable condenser should be connected to the filament. (3) Not more than $\frac{1}{4}$ " nearer, if possible. (4) Be sure that all coils are wound in the same direction. Test various voltages of B battery.

HOW can I build a crystal set that is fairly selective?—M. A. Richardson, Fayette, Mo.
See RADIO WORLD, issues of December 6 and January 24.

I HAVE placed a variometer in series with the plate of the detector tube of my 4-tube set, 1 RF, detector and 2 AF. I get only a negligible increase in signal strength. Can you tell me what to do?—Wales Jacobs, Box 57, Oakville, Conn.

Unless you are using tuned radio-frequency amplification, the variometer will be practically of little value. Fixed RF will not allow a set to regenerate equally on all wavelengths. Put a .001 fixed condenser across the primary of the first AFT. Maybe your detector tube isn't efficient.

CAN you tell me where I can secure a Bruno tuning coil for use in "White's 2-tube set as described in the issue of Dec. 6?—W. F. Norton, RD 6, Shelby, O.

Bruno Radio Corp., 296 Water St., New York City.

IN the construction of an RF transformer what number wire and how many turns should I have for the primary and secondary?—H. C. Smith, Lewiston, Pa.

No. 20 DCC; 8 turns on the primary, 50 turns on the secondary. Both wound in the same direction and on the same form, $\frac{3}{8}$ " diameter, 4" high.

I AM using Northern Electric peanut tubes in my 3-tube set. Would I get better all-around results if I used 199s?—Chas. L. Dalton, Eatonia, Sask., Can.

Unless your present tubes are defective better results need not be expected from such a change.

HOW may I reduce the hum from an alternating current street light?—Clifford Larson, International Falls, Minn.

Your aerial should be at right angles to the power line. Change your ground connection; if possible, change the position of your set, i.e., move it into another room.

I HAVE an Erla 3-tube reflex set and was thinking of turning it into a 5-tuber when I noticed the Caldwell 5-tube reflex which interested me. Will you kindly compare the two? (2) What transformers used in the Erla construction can be used on this set?—Harry J. Shaffer, 616 Lyons Ave., Irvington, N. J.

(1) You may of course expect greater DX and volume from five tubes than from three. (2) ALL

KINDLY tell me the number of turns on the coils of a Superdyne?—E. B. Block, 712 North 2nd St., McGeehee, Ark.

Primary 8 turns wound directly over the secondary, which has 55 turns wound on a form $\frac{3}{4}$ " in diameter. Tickler, a rotor in inductive relationship with the primary and secondary, 30 turns, plate coil 35 turns on $\frac{3}{4}$ " diameter tubing No. 22 DCC wire used throughout.

I AM UNABLE to obtain satisfactory results using an aperiodic primary on my coupler. I have connected, therefore, the aerial and ground directly on the secondary. Do you think that I have sacrificed anything by doing this? (2) I have tried push-pull for the third stage of audio and get some wonderful howls. Is there any way of overcoming this? (3) Do you think that vernier dials would benefit my receiver? (4) Does the length of the leads from the coils to the condensers have a great deal to do with the volume?—A. E. Phiesnek, Roxbury, Conn.

(1) You sacrifice selectivity. (2) Shield each transformer separately, grounding the shield. All leads must be short and directly to the point. (3) A vernier type of dial is no help in this type of receiver. It only enables you to tune more slowly, thereby getting a better adjustment for distant stations on a critical set. (4) Not much except for the lead from the grid condenser to the grid of the tube, and the plate leads.

IS a C battery used in the Superdyne?—G. E. Muller, 4154 N. 5th St., Phila., Pa.
A C battery will benefit any audio amplifier besides cutting down on the B battery drain.

WHAT type of indoor aerial is best? (2) What 3-tube set would you recommend, using dry-cell

tubes and indoor aerial? (3) Could I get distance? (4) Would Abner J. Gelula's Superflex work all right with 199s?—M. Darrant, 772 Windermere Ave., Toronto, Can.

(1) No. 18 DCC wire in a straight line, if possible, with insulators at ends. Otherwise around the moulding. (2) The Superflex as described in the issue of Dec. 27. (3) That is difficult to say, as distance depends on many factors other than the type of aerial used.

HOW may I use a spreader counterpoise system on the roof of my apartment house? I have heard this is better than a ground.—Charles L. Mulligan, 6802 Ridge Blvd., Brooklyn, N. Y.

The manner of erection is shown in Fig. 81.

coupler, a variometer and a variable condenser, the 3-circuit regenerative receiver may be built. (3) Yes to both.

REFERRING to Lieut. Peter V. O'Rourke's 1-tube set as described in the issue of December 6, is it necessary to use a vernier low-loss condenser or would any good low-loss condenser without vernier be just as efficient? (2) What resistance should the rheostat be for the type 11 tube?—Anthony Mitz, Cleveland, O.

(1) The vernier is not absolutely necessary, but aids in getting DX. (2) 6 ohms.

MY Neurodyne won't "neut." I neutralize it one evening and it's O.K. for that evening. But

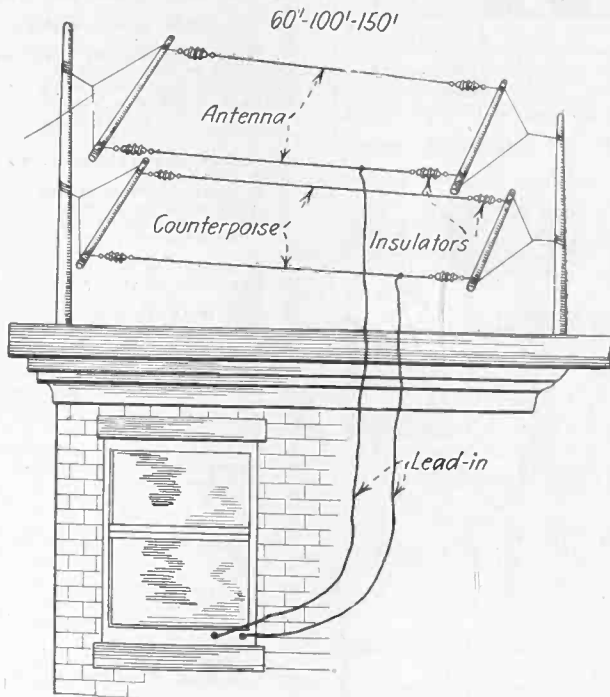


FIG. 81, showing counterpoise system.

The length of each individual aerial or counterpoise wire should be the same. Make it as long as possible, up to 150 feet. See that the antenna leadin does not touch the counterpoise wire.

ARE the variable condensers for the Superdyne .001 or .0005 mfd.? (2) I have two moulded variometers, a .001 variable condenser, a .0005 variable condenser. What circuit would you advise, to make two or more sets? (3) Can condensers having small insulating bushings with metal end-plates for the rotor shaft, be termed low-loss? Have they any advantage over ordinary condensers?—Victor Kirby, Bellevue, Ont.

(1) .0005 mfd. (2) With a variocoupler, a vario-

the following night I have to reneutralize it. Can you give me any hints on neutralizing? (2) What may I add to my Neurodyne to make it more selective? (3) Is it possible to Super-Net my neurodyne without disturbing the cabinet in which it is boxed?—M. H. G., 1016 Madison Ave., Scranton, Pa.

(1) May be the neurodons have either too much or not enough capacity. Unless the neuroformers are of the spiderweb-coil type, it is necessary that the angle at which the neuroformers are mounted be correct (57.3 degrees) if neutralization is to be perfect. (2) A wavetrap; make it regenerate by the addition of a variometer in series with the plate of the detector tube. (3) No.

Join RADIO WORLD'S University Club

and Get your own number. Put the number on your queries and they will be answered personally the same day as received.
And Get Full Question and Answer Service for the Coming 52 Weeks.

RADIO WORLD, 1493 Broadway, New York City:

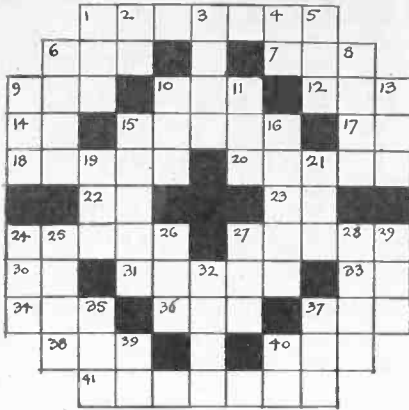
Enclosed find \$6.00 for RADIO WORLD for one year (52 Nos.) and also consider this as an application to join RADIO WORLD'S University Club, which gives me free information in your Radio University Department for the coming year, and a number indicating my membership.

Name
Street
City and State

Telegraph queries will be answered collect the same day as received. Be sure to direct in your queries that the answer be sent collect.

Radio Cross-Word Puzzle

HEREWITH is published a radio cross-word puzzle. If you can solve it send your solution to Cross-Word Puzzle



HORIZONTAL

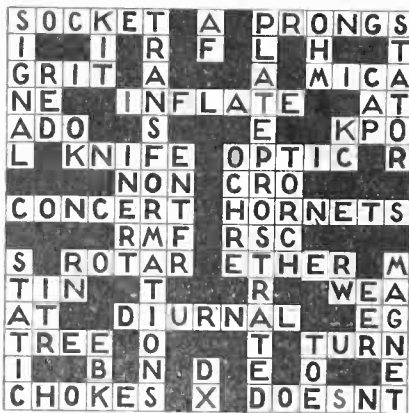
1. Originator of wireless.
2. One who acts for another (abbr.)
7. Member of an Eastern nation using radio extensively.
9. Initials of "Roxy's" real name.
10. Word used to specify routing of a radio-gram, etc.
12. Our (French, plural).
14. Advertisement.
15. Made unnecessary by wireless photography.
17. Island on which WAHG is located.
18. Title of No. 6, vertical.
20. Theoretical medium which transmits electric waves.
22. Otherwise.
23. Abbreviation for a state, home of WJAR.
24. Something all radio parts should be, for the poor man.
27. Wireless.
30. A diphthong.
31. What occurs when announcer finishes before orchestra is ready.
33. Abbreviation used after the names of county seats.
34. Good thing to have when erecting aerials, etc.
36. Sent out by electric searchlight.
37. Jewel.
38. Slang word meaning one clever at radio construction or other specialty.
40. Kind of bar used in radio sets.
41. Used in wet cells (plural).

VERTICAL

1. Catholic religious title (abbr.)
2. A preposition.
3. A continuous series of rings of wire.
4. Abbreviation for a state, home of WOR.
5. Man's name, usually Scotch.
6. Famous woman singer who recently broadcast.
8. A battery has two.
9. First name, short form, of No. 9, horizontal.
10. Vigor.
11. Soul, spirit (French).
13. Title of a knight (abbr.)
15. An electric measuring unit, named for British scientist.
16. An interfering atmospheric disturbance.
19. John's last name who is always getting into law-suits.
21. Concealed.
24. A head-covering.
25. Need a good one to understand radio.
26. Synonym for No. 10, horizontal.
27. First name, girl's or boy's.
28. Freezes.
29. Unit of electrical resistance.
32. The symbol of meekness and docility.
35. A component of varnish used on radio panels, etc.
37. Man's name.
39. A college degree (abbr.)
40. A department at Washington furnishing information as to radio laws and regulations (abbr.)

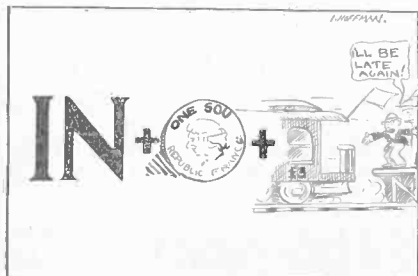
Editor, RADIO WORLD, 1493 Broadway, New York City. The names of those sending in the solution will be published.

The solution of last week's puzzle follows:



The Weekly Rebus

WHAT does this rebus represent? Send answer to Rebus Editor,



RADIO WORLD, 1493 Broadway, New York City.

The names of those sending the solution will be published.

- M. E. Reynolds, 400 East 51st Street, New York City.
- C. Fairweather, 228 E. 120th St., New York City.
- Max H. Hopf, Harper, Tex.
- Edwin Balock, Montgomery, Ala.

For Crystal Set Owners

Illustrated articles on the making and use of crystal sets appeared in Radio World dated Dec. 6, 20 and 27, 1924, and Jan. 24, 1925. 15c per copy, or the 4 copies for 60c.

RADIO WORLD, 1493 Broadway, New York

This Nameplate Sent Free!



Put it on the panel when you build RADIO WORLD'S 1925 Model 4-Tube DX Superdyne. Send in your order now. As these beautifully colored nameplates are now being manufactured it will take a little time before we can deliver them. They are of the transfer type (decalcomania) and may be put on just as easily after the set is built. Address Superdyne Editor, RADIO WORLD, 1493 Broadway, New York City.

GET ON THE LIST

- G. Eastman, Birmingham Elec. Co., Birmingham, Ala.
- Chester Lee, Grove St., Sidney, O.
- Henry A. Westermeyer, Cleveland, Wis.
- Delmas Randall, 2507 Rutland St., Houston Heights, Texas.
- Chas. S. Suly, 1 Salina St., Rochester, N. Y.
- Geo. M. Schreck, 356 E. 32nd St., Paterson, N. J.
- Gus Egarius, 7212 Kedron St., Pittsburgh, Pa.
- L. P. Platt, 517 Indian Terrace, Rockford, Ill.
- Wm. T. Slocum, 241 Joline Ave., Long Branch, N. J.
- Carl White, Vincennes, Ind.
- Ambrose T. Barnes, 830 Berkley Ave., Plainfield, N. J.
- Frank Konop, 1315 First Ave., New York City.
- John R. Corsiglia, 5338 N. Western Ave., Chicago, Ill.

Literature Wanted

THE names of readers of RADIO WORLD who desire literature from radio jobbers and dealers, are published in RADIO WORLD on request of the reader. The blank below may be used, or a post card or letter will do instead.

Service Editor,
Radio World,
1493 Broadway, New York City.
I desire to receive radio literature

Name

City or town

State

Are you a dealer?

If not, who is your dealer?

His Name

His Address

- H. C. Hagerty, 217 W. 9th St., Michigan City, Ind.
- G. H. Smith, 712 W. Rich St., Columbus, O.
- W. G. Stratton, 153 Elm St., Bridgeport, Conn.
- Frank T. Gilland, 821 Osage, Manhattan, Kan.
- N. S. Irwin, 598 W. 177th St., New York City.
- E. J. Matlock, 921 2nd Ave., Juniata, Pa.
- H. E. Crawford, 425 61st St., Brooklyn, N. Y.
- W. C. McDonald, Columbus, Mont.
- A. Chase Thompson, 113 Trinity Pl., Syracuse, N. Y.
- R. F. Peters, Cloverport, Ky.
- Joe Beaver, Purcell, Okla.
- J. H. Jolly, 1800 C St., N. W., Washington, D. C.
- M. R. Atkinson, 805 Central Station, Memphis, Tenn.
- Henry P. Lewis, A. & M. College, Mississippi.
- Rosendo S. Abras, Phoenix Utility Co., Cienfuegos, Cuba.
- Wm. M. Eastwood, 3220 Colgate St., Baltimore, Md.
- Ed. Jenkins, 703 E. Maine St., Louisville, Ky.
- Geo. S. Weaver, 741 Munch Chunk, Easton, Pa.
- J. E. Fisher, Box 847, Oklahoma City, Okla.
- R. S. Welsh, 1951 Clences Ave., Norwood, Ohio.
- Stephen Koktavy, New Prague, Minn.
- B. W. Nash, RFD 3, La Grange, N. C.
- K. S. Raymond, Ironton, Minn.
- James Mitchell, Highland Park Station, Rt. 1, Chattanooga, Tenn.
- M. F. Vandereer, Breton, Mont.
- Stephen H. Whitfield, Eastwood, N. Y.
- Lewis Racine, Michigan City, Ind.
- F. B. Black, Raymond, Neb.
- John H. Brown, 1932 N. Leithgow St., Philadelphia, Pa.
- W. C. Heinlein, 310 W. 126th St., New York City.
- Douglas Whitene, Hickory, N. C.
- R. L. Creel, Charlottesville, Va.
- Marshall Metz, Temple, Okla.
- Eugene Byrd, Benifay, Fla.
- Wm. A. Kundegraber, Radio Shop, Nevada, Mo.

JOIN THE A. B. C.

A B. C. stands for the American Broadcast Club. Join it today. It involves no dues or payment of any kind, and no obligations. It was founded by RADIO WORLD simply to unite the broadcast listeners and radio fans in general in a common bond to promote their welfare as occasion requires. Send your name and address to A. B. C. Editor, RADIO WORLD, 1493 Broadway, New York City.

- Douglas Whitenen, Hickory, N. C.
- Raymond Rhodes, 943 Queen St., Pollstown, Pa.
- Lewis A. Harrison, Ellis, Kan.
- J. E. Shermer, 5720 Knox St., Germantown, Philadelphia, Pa.
- Wm. H. Stephens, Prompton, Pa.
- Walter Baker, 11400 St. Aubin Ave., Hamtramck, Mich.
- Leonard Michalski, 2402 Berger St., Hamtramck, Mich.
- Robt. Henry, 909 Commercial St., Emporia, Kan.
- Wm. M. Eastwood, 3220 Colgate St., Baltimore, Md.
- Wm. J. Able, 373 Springside Ave., Pittsfield, Mass.
- N. S. Irwin, 598 W. 177th St., New York City.
- Cilver Skines, 815 Mellington, Chicago, Ill.
- Miss Labelle Raymond, 135 W. 72nd St., New York City.
- F. K. Weiser, 215 S. Broadway, Haskell, Okla.

A. B. C. Editor, RADIO WORLD, 1493 Broadway, New York City.

Please enroll me as a member of the American Broadcast Club.

Name

Address

City or Town

State

An Experimental Reflex

By Lieut. Peter V. O'Rourke

THOSE whose hobby is the reflex may care to try a reflex circuit which, although using only three tubes, provides two stages of radio-frequency amplification, detector and two stages of audio. It is difficult indeed to get anything satisfactory out of such a circuit, if neutralization is not resorted to. On the higher waves, say above 400 meters, one may expect to fare pretty well, but on the lower waves oscillations may set in. By using low-loss coils and condensers this tendency may be overcome in part. The circuit, however, is offered to the experimenter to see how far he can get with it, so that he may report results and explain how he obtained them. Generally little success has accompanied trial of this hookup, yet some one may strike the solution. If the set is hooked up and works well on the high waves, the experienced home constructor will then proceed to neutralize it, either using neutralizing condensers or a potentiometer,

forms, No. 26 single cotton covered wire being used, seventeen turns being put on. When the set is in operation try reversing the connections to L3 and L5.

The Audio-Transformers

The audio transformers may be both of the same ratio, not more than 5-to-1, or if different ratios are used, the higher ratio should be in the first stage, at left, Fig. 1.

Tubes to Use

The tubes should be 201A, operated from a 6-volt storage battery. R1 is a 6-ohm rheostat, controlling the two amplifier tubes. R2, the detector tube rheostat, should be 10 ohms preferably, but 6 ohms will work all right here, also. C5 and C6 are .00025 mfd. and for experimental use spare grid condensers of that capacity may be used. The grid condenser is .00025 mfd. also, the gridleak 2 megohms.

Invention for Secret Radio Bought by A. T. & T.

WASHINGTON.

FOLLOWING the denial of the American Telephone & Telegraph Co. that it contemplates sending out programs on secret waves, which presumably only those who pay for reception may hear, comes the announcement of its purchase of a secret communication patent. The invention (Patent No. 1,522,044) was developed by Ralph Brown, of East Orange, N. J., and assigned to the A. T. & T. One of the cardinal features of this invention is to provide improved and simplified receiving arrangements for secret communication systems.

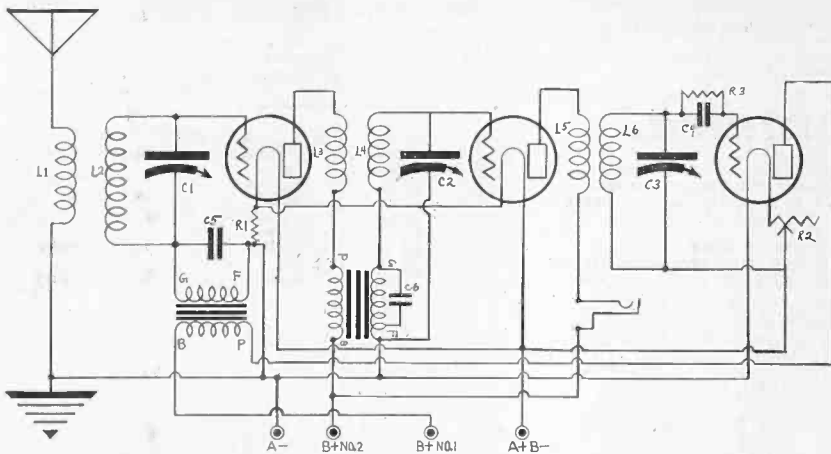


FIG. 1, circuit diagram of a 3-tube set, comprising two RF stages, detector and two AF stages.

of the detector tube (third) socket. One side of the rheostat R2, in the detector tube, goes to the A+ battery post, the other side of that rheostat to the F+ post of the detector socket.

The beginning of L2 goes to the stator plates of C1 and to the grid of the first tube. The A- goes to the F- post of the first AFT, the G post of that AFT being connected to the end of L2 and to the rotor plates of C1. Thus the end of L2 goes to the filament through the transformer secondary. A fixed condenser, C5, .00025 mfd. capacity, is connected across the secondary, one side of this condenser to the G post, the other to the F post. The plate of the first tube is connected to the beginning of L3, the end of L3 to the P post of the second AFT, the B post of this AFT to the amplifier voltage B battery, normally 90 volts, and shown in Fig. 1 as B+ No. 2.

The beginning of L4 goes to the stator plates of C2 and to the grid of the second tube. The end of L4 connects to the G post of the second AFT, the F post to the A- battery post and to the rotor plates of C2. A fixed condenser, C6, bridges the secondary, from the F post to the G post. The capacity is .001.

The plate of the second tube goes to the beginning of L5, the end of L5 to one side of a single-circuit jack. The other side of the jack goes to the B+ amplifier voltage.

The beginning of L6 goes to one side of the grid condenser and to the stator plates of C3. The other side of the grid condenser goes to the G post of the detector tube socket. A grid leak, 2 megohms, is mounted across the leak. The end of L6 goes to the rotor plates of C3 and to the A+ battery post. The plate of the detector tube is connected to the primary of the first AFT, the other side of that primary to the B+ detector voltage, normally 22½ volts. Try the plate to the B post, the B battery to the P post (as in Fig. 1) and try reversing these connections.

WOR Heard 6,500 Miles, in South Africa

THE reception of a studio program, transmitted on a high wavelength, at Johannesburg, South Africa, a distance of 6,500 miles, was told of in a cablegram received by Station WOR, operated by L. Bamberger & Co. at Newark.

Executives of the broadcasting station said this was the first time that such broadcasting had been received at Johannesburg.

or perhaps both. This is not a set for the novice to attempt. It is very inviting, however, to the person who has a test board.

The Coils For the Set

L1L2, L3L4 and L5L6 are radio-frequency transformers. Those having such inductances already will probably use what they have, in conjunction with the proper value variable condensers. If duolateral or honeycomb coils are to be used, three of them will have to be obtained, each having 75 turns, from which twelve turns are removed, the new end being bound with a speck of sealing wax. The excess wire is wound on a small vaseline bottle, the resulting spiral-like wire then removed from the bottle and drawn together to reduce the diameter until it is small enough to permit the new coil to fit inside the honeycomb or duolateral coil. The terminals of the new winding are turned twice around the new coil, which constitutes the primary, and the inductance is forced inside the honeycomb. It will be found sufficiently secure in this position to prevent it from shifting about. The variable condensers then should be of .0005 mfd. each, normally 23 plates. If basketweave coils are to be used the secondaries consist of 50 turns of No. 20 double cotton covered wire on a 3" diameter having fifteen dowels. Wind under two, over two. For the first RFT, in this case, a 62-turn coil may be used, with a tap at the twelfth turn for connection to ground and A-. The other primaries may be wound on 2½" diameter basketweave

In the diagram the terminals of the audio transformers are designated. Try reversing the connections to the primary of the first audio transformer. The connections are shown with the plate of the detector tube going to the B post of the first AFT and the P post connected to the B+ detector voltage. The other way may work better.

I built this set but did not have much success with it under 400 meters. I therefore submit the problem to RADIO WORLD readers, for some one may emerge with a fine solution. If the set is neutralized with small condensers (Neutrotons) it will behave, but there may be some yet unfound way, exclusive of the potentiometer.

Use of C Battery

If C batteries are to be tried, preferably use two. Connect one 4½-volt C battery with the positive post to the G of the first AFT and the negative post to the end of L2 and to the rotor of the variable condenser C1. The other C battery would be similarly connected between the G post of the second AFT and the end of L4 and rotor of C2.

Wiring Directions

Connect the beginning of L1 to the aerial, the end to the ground and to A-. The A- battery post is joined to one side of the first RF-AF tube rheostat, R1, the other side of that rheostat to the F- post of that socket and also to the F- post of the second socket. The A- goes direct from battery to the F- post

Snowed Under



FOLLOWING the appearance of Victor artists before the microphone of WEAF, with which seven other stations were interconnected, the New York station was simply snowed under by applause letters. Most of these lauded the singing of John McCormack. (United).

No More McCormack?

THE singing of John McCormack before the WEAF microphone, which created a nation-wide sensation, may not be repeated, for Mr. McCormack's manager is said to have prevailed upon the popular tenor not to do any more broadcasting. The manager, Dennis Sweeney, lifelong friend of the tenor, was against the broadcasting from the start, but Mr. McCormack overruled him. At the last moment Sweeney even tried to get the hour of broadcasting changed. Although the sale of McCormack records rose meteorically after the broadcast, especially the record of the "All Alone" song he sang from WEAF, it is reported that Mr. McCormack is through with broadcasting. What is the attitude of the other great artists could not be learned. Lucrezia Bori, who broadcast with McCormack, and Frances Alda, who would suffer no competitor when she sang two weeks later, may be heard again over the air.

There has been some talk, too, of complaint from operatic sources against the interconnecting of stations with the WEAF microphone. The Victor Company and the American Telephone & Telegraph Co., who are doing all they can to make a big success of this experiment in aiding radio and phonography at the same time, have to contend with the difficulty of satisfying artistic temperaments that are unassuaged by any direct payment for their broadcasts. The only gain the artists acquire is in added reputation and prestige and the royalties from the sales of records.

Snodgrass Is Freed

JEFFERSON CITY, MO.

HARRY SNODGRASS, former star performer at WOS, was freed from prison after serving a term for attempted holdup in St. Louis. Snodgrass, known as "King of the Ivories," said:

"I am a new man. I promised to make good. It made me feel good to get so many gifts and expressions of confidence from radio fans. I will not fail them."

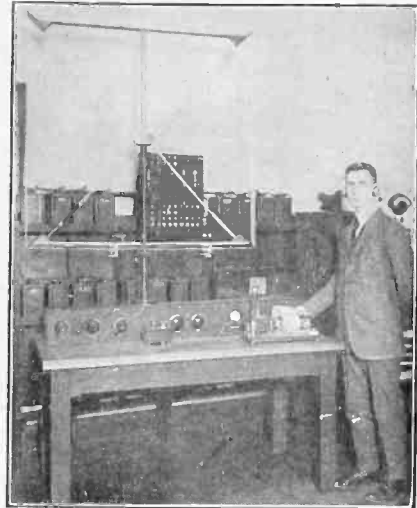
Snodgrass is going on a vaudeville tour with Don Witten, veteran announcer of WOS, who left prison the same day as Snodgrass.

Part of the broadcasting equipment of station WOS was moved from the studio in the Missouri Capitol dome to the Chamber of the House of Representatives, and, while a visible audience of several hundred persons crowded the hall to hear him, an invisible one of hundreds of thousands in all sections of the country listened to Snodgrass's final broadcast as a prisoner. In the audience was Mrs. Harry Snodgrass, the musician's wife, and their 8-year-old son.

While the visible audience applauded, messenger boys brought hundreds of telegrams of applause from the invisible audiences.

At the microphone was Witten, who recently won second place in a nation-wide contest to determine the most popular radio announcer. Snodgrass was voted the most popular radio entertainer in RADIO WORLD'S popularity contest. The ballots were cast by his sympathetic admirers. Witten won second place in the contest of another magazine.

Sun Test



WITH this apparatus the Bureau of Standards made observations of the effects of the total eclipse of the sun on radio reception and transmission. Thomas Parkinson of the Bureau is shown. (United).

Rac



THE HARD OF HEARING in New York City, are equipped with H. B. Warner in the amplified sound from Annetta W. Peck, ex- at extreme left



AFFLICTED children find that radio helps to make them forget their ills and necessary waiting for that happy hour when they will emerge from their hospital party is quite a treat for these youngsters. Some of them are not strong enough but they do get a lot of fun from listening in, nevertheless.

SNODGRASS'S FAREWELL—Harry M. Snodgrass, convict of State penitentiary, who gained nation-wide fame as the "King of the Ivories" by his piano playing from state radio station WOS at Jefferson City, Mo., is freed from prison with a well-filled purse. Officials of the radio station in all parts of the country have sent the convict-musician more than \$10,000. Snodgrass says he will give all the money to his radio fans to his wife and 8-year-old boy, "to try and repay to them the hardships they have gone through since I got into trouble. I was sent to the prison from St. Louis in June, 1923, to serve the remainder of a conviction of taking part in an attempted holdup. (Underwood & Looney)



Radio Aids Afflicted



THEY ARE HELPED—One hundred seats in the National Theatre, New York, are reserved for those who wear headphones, so that persons hard of hearing may enjoy the performance of the melodrama "Silence." Direct wired connections are used to convey the transmitter on the stage to the ears of those wearing the headsets. Miss [Name], secretary of the New York League for the Hard of Hearing, is shown in a theatre party given by the league. (International Newsreel).

Their Lot Improved

RADIO and its adjuncts are helping the afflicted more and more. An example is the use of headsets in a New York City theatre where headsets are used by those hard of hearing so they can hear every transmitted word that the actors utter. Radio's aid to wounded veterans and others in hospitals is another example of its glorious advantages.



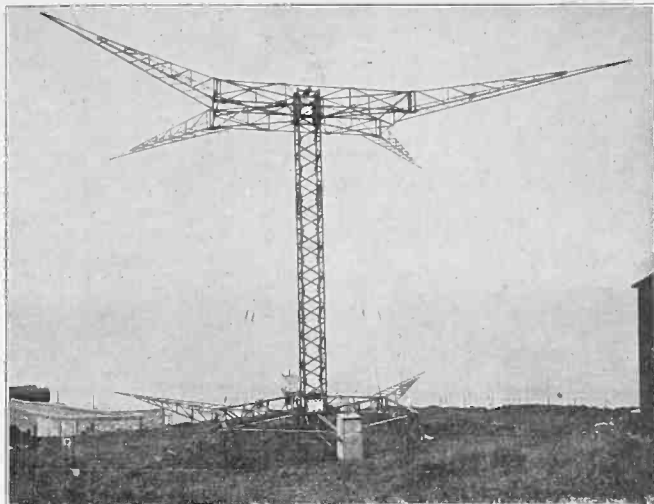
...the more bearable the ...cots cured. A radio ...to leave their beds,

...Missouri ...Ivories," ...y, left the ...that radio ...\$1,500 and ...ives from ...for all of ...Snodgrass ...ears upon ...erwood)



"CHARLOTTE NORRIS," the mystery girl, broadcasting from WEBA, Chicago, her appeal for identification. As if the hand of fate were in the air, her aunt, in St. Louis, listened in. Then the mystery of this amnesia victim's identity was punctured. (Underwood & Underwood).

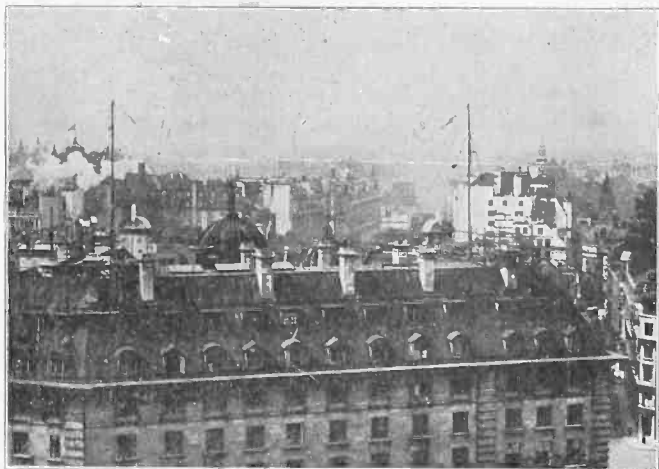
Beam Transmission



A RADIO LIGHTHOUSE—The antenna structure of the Marconi rotating beam transmitter (above), situated at Firth of Forth, Scotland, consists of two wheel-like counterpoised aerials. By rotating the wheels while transmission is going on the wave, sent on a very high frequency, sweeps around the circle. Rotating straight-line transmission is thus effected, known as beam transmission, the beam being somewhat like a narrow ray of light describing a circle in its smoothly varied plane of travel. Thus a ship desiring to obtain its bearings in relation to the transmitter tunes in on the very short wavelength and picks up the signal once in every revolution of the antenna wheel. That time is when the beam is in direct line with the point of reception. (Underwood & Underwood).

Possibilities of the Beam

GUGLIELMO MARCONI'S experiments in beam transmission have been so successful that there is much speculation regarding the employment of this method by some broadcasting stations. Although it is not quite clear what the stations would gain, since the audience would be rendered much smaller, it is nevertheless true that big radio interests are quick to buy up patents that cover methods of putting reception on a privacy basis. Perhaps the day is coming when there will be a "diamond horseshoe of the air" and the wealthy will listen to the voices of great singers, on special receiving sets tuned to the secret wave and upon which the polloi will not be able to poach.



THE AERIAL of 2LO is a small affair, isn't it? The insulators give an idea of its length. (Underwood & Underwood).

Goal of DX Huntsmen

THE goal of nearly all distance-hunting fans in the United States is 2LO, London. The station, operated by the British Broadcasting Co., is at Marconi House, Strand. The Marconi transmitter is on the top floor of this building (extreme left) and is connected to the studio by underground cables.

BROADCAST PROGRAMS

Thursday, January 29

KFDY, Brookings, S. D., 273 (C. S. T.)—8 P. M., Ruth Haroldson, violinist, and Gail Haroldson, pianist. 8:10, South Dakota club boys and girls, club songs, talk. 8:35, piano solos, Gail Haroldson. 8:40, "Swine Management," by Turner Wright. 8:50, violin selections, by Ruth Haroldson.

WEEL, Boston, 303 (E. S. T.)—6:30 P. M., Big Brother Club. 7, Dok-Eisenbourg and Sinfonians. 8, program from New York Studio.

WHO, Des Moines, Ia., 522 (C. S. T.)—2:15 P. M., Pathe News.

WWJ, Detroit, 517 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "Tonight's dinner" and a special talk. 9:45, bulletins. 10:25, weather. 11:55, time. 3 P. M., News orch. 3:50, weather. 8:55, market reports. 8:30, the Detroit News orch. 10, Jean Goldkette's orch. 11, News orch.

KGO, Oakland, Cal., 312 (P. S. T.)—10:40 A. M., classroom instruction. 11:30, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 4, concert orch. 6:45, final reading, stock reports, weather, S. F. produce news, and news. 8, "Arms and the Man," Geo. Bernard Shaw's three-act play. 10, Henry Halstead's orch.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Civic Music Club. 3, children's program. 7:15, market, weather and news, police reports.

WKAQ, Porto Rico, 360 (E. S. T.)—8:30 P. M., concert.

KSD, St. Louis, Mo., 546 (C. S. T.)—4 P. M., the home hour.

KHJ, Los Angeles, 395 (P. S. T.)—12:30 P. M., Majestic Six orch. 2:30, matinee musicale; Grace Curtis, harpist; Joseph Heindl, cellist, and George Hood, reader. 6, Art Hickman's orch. 6:30, children's program. 7:30, "Art," by Harold Swartz. 7:45, "Care of the Body," by Dr. Philip M. Lovell. 8, Beth Woodruff Nordwall. 10, Earl Burnett's Dance orch.

WJZ, New York City, 455 (E. S. T.)—10 A. M., Housewives League menu. 10:20, Review of Reviews. 10:30, "Household Equipment" Ethel R. Peysor. 10:40, editor of Needle Art talk. 10:50, Eleanor Gunn's fashion talk. 1 P. M., Nathan Abas' music. 4, Chilean program. 4:30, Bernhard Levitov's tea music. 5:30, State and Federal agricultural reports, farm and home market reports, New York Stock Exchange, foreign exchange, news. 7, Bernhard Levitov's orch. 7:55, "Hints for Husbands," by John B. Kennedy. 8, Wall Street Review. 8:10, "Mineral Resources," by E. R. Lilly. 8:25, "Learn a Word a Day." 8:30, U. S. Navy band. 9:30, Wanamaker organ recital. 10:30, Joseph Knecht's Waldorf Astoria dance orch.

WDAR, Phila., 395 (E. S. T.)—11:45 A. M., daily almanac. 12:02 P. M., organ recital, features from the studio, Arcadia concert orch. 2, Arcadia concert orch., Lillian Foster and Marcella North. 4:30, artist recital, by Mildred Tindale, soprano; Kathleen Dalton, pianist. 5, question period. 7:30, Dream Daddy.

WGY, Schenectady, N. Y., 380 (E. S. T.)—2 P. M., "Picnicking with Our Children." 6:30, dinner music. 7:45, book talk, L. L. Hopkins. 8, studio program. 8:30, program of United States Navy band.

WCCO, Minneapolis, Minn., 417 (C. S. T.)—10:45 A. M., home service, Betty Crocker. 2, P. M., "The Popular Concert," Mrs. Agnes Fryberger. 4, magazine hour, "William the Conqueror." 5:30, children's hour. 6:30, dinner concert, Dick Long's Nankin Cafe orch. The Kater Brothers Quartet. 7:30, feed talk. 7:45, "A Thousand Years of Surgery," 8, true value of Arctic work, Donald McMillan, Arctic explorer. 8:15, musical program. 9, silent hour. 10, dance program, Dick Long's Nankin Cafe orch.

WRC, Washington, D. C., 469 (E. S. T.)—6:45 P. M., children's hour. 7, dinner music by the Lee House trio. 8, talk under the auspices of the Smithsonian Institute. 8:30, concert by the United States Navy band. 9:30, talk. 9:55, time. 10:30, dance music.

KYW, Chicago, 536 (C. S. T.)—6:30 A. M., morning exercises. 9:30, late news and comments of the financial and commercial markets. 10:30, farm and home service. 11:35, table talk, by Mrs. Anna J. Peterson. 2:35 P. M., "Afternoon Frolic." 6:02, news, financial and final markets. 6:35, children's bedtime story. 7, Joska DeBabary's orch. 7:10, Coon-Sanders Original Nighthawks. 7:20, Joska DeBabary's orch. 8, "Twenty Minutes of Good Reading," by Rev. C. J. Pernin. 8:20, musical program, artists and detailed program. 9:15, "Safety First" talk. 10, "Evening at Home" program.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Corinne Lehmann, violinist. 10:20, John Cutting, Book Review. 10:30, Corinne Lehmann. 10:40, Dorothy Howe, Child Psychology. 10:50, Corinne Lehmann. 1:30 P. M., Scripture Reading under auspices American Bible Society. 1:35, Raymond Parker, tenor. 2 Norman Slepman, pianist. 3, interview with George Arliss, by Terese R. Nagel. 3:10, Jessie Morse Berenson, soprano. 3:20, Louise Rice, graphologist. 3:30, soprano. 3:40, Mrs. Viola Anglin, probation officer. 3:50, soprano. 6, Uncle Geebe. 6:30, Red and Gray

Fleta Will Make His Radio Debut on Thursday

STARS for the third Victor radio presentation on Jan. 29 were announced as Miguel Fleta, tenor, of the Metropolitan Opera House; Lucy Isabelle Marsh, lyric soprano, and the Flonzaley Quartet. None of them has ever broadcast before.

The program will be broadcast from Station WEAJ, New York, and relayed by wire to Stations WCAP, Washington; WJAR, Providence; WFI, Philadelphia; WDBH, Worcester; WGR, Buffalo; WCAE, Pittsburgh, and WEEL, Boston. Its numbers include four selections by Fleta, "La donna e mobile" from Verdi's "Rigoletto," an aria from Bizet's "Carmen," "Mi Tierra" and "Ay-Ay-Ay." Miss Marsh will sing "Ave Maria," "The Swallows," "Within a Mile of Edinboro" and "Beautiful Lady." The Flonzaley Quartet will play a movement from the Quartet in D by Haydn, "Music of the Spheres," by Rubinstein; "Nocturne," by A. Borodin, and "Drink to Me Only With Thine Eyes," arranged by Alfred Pochon.

Melody Boys. 7, "What the World Is Doing." 7:10, Red and Gray Melody Boys. 7:15, Belle Bart, "New Astrology." 7:30-8:30, Armand Vecsey and orch.

WIP, Phila., 509 (E. S. T.)—1 P. M., Gimbel Tea Room orch. 1:30, weather. 3, Ralph H. Carlin; tenor, Captain L. G. Pritchard; Flora Ripka, accompanist. 6, weather. 6:05, Club Madrid orch. 7, Uncle Wip's roll call. 8, Paradise on Earth, a talk by Geo. G. Calhoun. 8:15, The Delaplaine Minstrel Troup. 9, violin recital by Jacob Rader, winner of the Philadelphia Music League prize. 11, Harvey Marburger and his vaudeville orch.

Friday, January 30

WHO, Des Moines, Ia., 522 (C. S. T.)—7:30 P. M., classical program. 8:30, the Williamson Bros., mandolin, guitar and banjo artists.

WEEL, Boston, 303 (E. S. T.)—2 P. M., Happy Hawkins and his orch. 6:30, Big Brother Club. 7, musicale. 8, program announced. 9, musicale.

WEMO, Barrien Springs, Mich., 286 (C. S. T.)—9 P. M., Radio Lighthouse Choir. 9:15, Life of Isaac Watts, singing a few of his well-known hymns. 9:30, Ruth Lee, soprano. 9:45, Mary Lamson, reader. 10:05, Ralph Wade and E. DeLong, saxophonists.

WWJ, Detroit, 517 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "Tonight's dinner" and a special talk. 9:45, bulletin. 10:25, weather. 11:55, time. 3 P. M., News. 3:50, weather. 3:55, market reports. 8:30, News orch.; Anne Campbell, poet; Norman Butterfield, baritone.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 3, musical program, speaker. 4, concert orch. 5:30, the girls' half hour. 6:45, stock reports, weather, S. F. produce news, and news.

WOO, Philadelphia, 510 (E. S. T.)—11 A. M., organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 7:30, police reports; A. Candelori and his orch. 8:30, special program from studio. 9:25, musical program—James MacDonald, tenor; Douglass MacDonald, baritone; Harriette G. Ridley, accompanist. 9:55, time. 10:02, weather. 10:03, Hotel Adelphia orch. 10:30, Vincent Rizzo and orch.

WBZ, Springfield, Mass., 337 (E. S. T.)—11:55 A. M., time, weather, Springfield market. 7 P. M., market report. 7:05, bedtime story. 7:15, sketches from history. 7:30, concert by the Hotel Kimball trio. 8, broadcast from Boston Arena. 9:55, time, weather.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert. 5, children's program. 7:15, market, weather and news, police reports. 8, lecture. 10:30, Hoot Owls.

KSD, St. Louis, Mo., 546 (C. S. T.)—8 P. M., Central Wesleyan College Band and Glee Club.

KHJ, Los Angeles, 395 (P. S. T.)—12:30 P. M., Perry's orch. 2:30, matinee musical. 6, Art Hickman's concert orch. 6:30, children's program. 8, Mullen & Bluett, program. 10, Earl Burnett's orch.

WJY, New York City, 405 (E. S. T.)—7:30 P. M., Billy Wynne's orch. 8:15, "State Legislative Review," Julius S. Berg. 8:30, "Inside the Lines," play. 10:30, Ace Brigade and his fourteen Virginians.

WJZ, New York City, 455 (E. S. T.)—10 A. M.,

Housewives League menu, Mrs. Julian Heath. 10:20, book review. 10:30, "Health and Beauty," by Ruth Champenois. 10:50, Eleanor Gunn's fashion talk. 11, "Scottish Recipes from Chief Steward of a Scottish Ship." 1 P. M., Hotel Ambassador Trio. 4, Anne Tyndall, soprano. 4:30, Hotel Belmont tea music. 5:30, State and Federal agricultural reports, farm and home market reports, New York Stock Exchange, foreign exchange quotations, news. 7, Erdody's Park Lane orch. 8, Wall Street Journal Review. 8:10, "Public Speaking," by Alvin C. Busse. 8:40, "Learn a Word a Day." 8:41, John Cassidy, baritone. 9, book review, by Clifford Smyth. 9:15, "The Texans," Milstead & Sanchez. 9:30, Loose-leaf Current Topics. 9:45, Ernesto Berumen, pianist. 10, "Surgery at Sea," 10:15, Ernesto Berumen, pianist. 10:30, Beaux Arts orch.

WGY, Schenectady, N. Y., 380 (E. S. T.)—2 P. M., "Health Hints," by Dr. C. W. Woodall. 6:30, stories for children. 7, International Sunday School lesson. 7:45, health talk. 8, address, "The Pan-American Scientific Congress." 8:30, radio drama, "Inside the Lines," by Earl Derr Biggers. 10:30, Tschakowsky program.

WCCO, Minneapolis, Minn., 417 (C. S. T.)—10:45 A. M., home service, Betty Crocker, "A Reducing Diet." 2 P. M., woman's hour, "The Visiting Nurse," Eleanor Zuppan. 2:30, matinee musical. 4, magazine hour, "William the Conqueror." 5:30, children's hour. 6, sport talk. 6:30, Dick Long's Nankin Cafe orch. 7:30, "Brainerd Night." 9, "Pa's F. and R. Family." 10, silent hour.

WRC, Washington, D. C., 469 (E. S. T.)—4 P. M., fashion developments of the moment. 4:10, piano recital by Eleanor Glynn. 4:20, "Beauty and Personality," by Elsie Pierce. 4:30, tea music by Meyer Davis' New Willard Hotel Trio. 6, children's hour by Peggy Albion.

KYW, Chicago, 536 (C. S. T.)—6:30 A. M., morning exercises; this service is also given at 7 a. m. 9:30, late news and comment of the financial and commercial markets. 11:35, table talk by Mrs. Anna J. Peterson. 6 P. M., news, financial and final markets, Dun's and Bradstreet's weekly review. 6:35, children's bedtime story. 7, Joska DeBabary's orch. 7:10, Coon-Sanders Original Nighthawks. 7:20, Joska DeBabary's orch. 8, "What Illinois Produced and Sold in 1924," by A. C. Page; "Painting and Son's Signs on Illinois Farms," by H. C. Butcher. 9, midnight revue.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Leonard Ionquist, pianist. 10:20, Mrs. Maybelle A. bridge, beauty talk. 10:30, Leonard Ionquist. 10:40, Lillian Regan in "Historical Characters." 10:50, Leonard Ionquist. 1:30 P. M., "Future Reading." 1:35, Blue Horse Instrument quartet. 3, interview with Rosalie Stewart, famous women theatrical producer. 3:10, U. S. A. wauke trio. 3:20, Madaline Thayer, famous people Broadway Never Meets. 3:30, trio. Dr. Alfred Robyn, harmony and composition lessons. 3:50, U. S. S. Milwaukee trio. 6, Uncle Geebe. 6:30, Abner Gelula, technical editor RADIO WORLD, on "Radio Problems." 6:45, Nat Martin and his "I'll Say She Is" orch.

WIP, Phila., 509 (E. S. T.)—1 P. M., Gimbel Tea Room orch. 1:30, weather. 3, "A Diet for Anaemics," a talk by Mrs. Anna B. Scott, food expert. 3:15, artist recital by Norman Grieg, baritone; Elizabeth Gear, pianist, and Walter Richardson, Irish tenor. 6, weather. 6:05, popular numbers by Mark Fisher and Joe Burke. 6:15, Harvey Marburger and his vaudeville orch. 6:45, agriculture, market reports. 7, Uncle Wip's bedtime story.

WDAR, Phila., 395 (E. S. T.)—11:45 A. M., daily almanac. 12:02 P. M., organ recital studio features. 2, Arcadia concert orch., playlet. 4:30, Dixie Ridge Serenaders. 7:30, Dream Daddy. 8, a book review, by Arnold Abbott. 8:10, "Fifteen Minutes with Sam Wingfield." 10, meeting of the Morning Glory Club, Arcadia dance orch., Salvatore Pizza, director. 1, features from the studio.

Saturday, January 31

WWJ, Detroit, 517 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "Tonight's Dinner," and a special talk. 9:45, public health service bulletin. 10:25, weather. 11:55, time. 3 P. M., News orch. 3:50, weather. 3:55, markets.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theater organ, police bulletins, weather, "Just Among Home Folks," readings, news. 4:55, market reports. 5, time. 7:30, Barney Rapp's orch. Wendell Hall, news, time.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 12:30, stock and weather. 4 P. M., concert orch. 8, San Francisco Musical Club; "The Proposed Changes in the Direct Primary Law," by J. H. Zemanaky; Arrillaga Musical College. 10, Henry Halstead's orch.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 10 P. M., Geo. Olson's Metropolitan orch.

KSD, St. Louis, Mo., 546 (C. S. T.)—8 P. M., City Club, Glee Club and orch.

KHJ, Los Angeles, 395 (P. S. T.)—12:30 P. M., program presenting Hi Moulton and his orch. 2:30, matinee musicale. 6, broadcasting Art Hickman's concert orch. 6:30, children's program. 8, program arranged by J. Howard Johnson. 10, Earl Burnett's dance orch. 12, broadcasting the Lost Angels of KHJ.

WJZ, New York City, 455 (E. S. T.)—1 P. M., Erdody's Park Lane orch. 4, Hock & Jerome, popular songs. 4:30, Sherry's tea orch. 5:30, State and Federal agricultural reports, farm and home market reports, New York Stock Exchange, foreign exchange, Evening Post news. 7, Joseph Knecht's Waldorf Astoria dance orch. 8, Joseph

Tuesday, February 3

Graham, soprano; Paul Haenestlar, accompanist. 8:30, "With Baron Von Humboldt in the Wonderland of South America," by Harry Chapin Plummer. 8:45, Elena De Sany String quartet. 9:15, "Radio as a Vacation," J. H. Dellinger. 9:30, Silvio Sideli, baritone. 10, Dittborn Howard's String orch. 10:30, Freddie Rich and Hotel Astor dance orch.

WGY, Schenectady, N. Y., 380 (E. S. T.)—7:30 P. M., International Intercollegiate Night.

WCCO, Minneapolis, 417 (C. S. T.)—6:45 P. M., children's hour by Marion Tucker. 7, dinner music by the Hotel Washington-Irving. Bocrnstein orch. 8, Bible talk. 8:45, concert of Chamber Music by the Elena de Sany String quartet. 9:15, to be announced. 9:55, time. 10:30, dance program by the Astor Hotel orch. 11:15, organ recital by Otto Beck.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Eleanor Schorer and Kiddie Klub. 10:40, Betty Reich, candy recipes. 1:30 P. M., Scripture reading. 1:35, The Jersey Collegians. 3, interview with Justice John Ford on Clean Books Bill. 3:10, Augusta Cooper, contralto. 3:20, Gertrude Tucker. 3:30, Augusta Cooper. 3:40, Mrs. C. H. B. Mullally, G. T. Woman of the Bible. 6, Uncle Geesbe. 6:30, Cameo Collegians. 9, author's night with Achmed Abdullah, Harry Dreko and others. 9:30, Sam Comly, movie chats. 9:45, May Singhi Breen, banjo, and Peter deRose. 10:15, lecture recital on Mozart, by Mildred Mills and the Crinoline Trio, Theodore Wright, baritone and Gordon Soule, pianist. 11, Vincent Rose and his orch.

WIP, Phila., 509 (E. S. T.)—1 P. M., organ recital by Karl Bonawitz. 1:30, weather. 3, George A. Lister and his orch. 6, weather. 6:05, St. James orch. 6:45, U. S. Department of Agriculture, livestock and produce market. 7, Uncle Wip's bedtime story. 8, America's new Passion play, "Vision," by Rev. John F. Burns. O. S. A. 10:05, Club Madrid orch. 11:05, organ recital by Karl Bonawitz.

WDAR, Phila., 395 (E. S. T.)—11:45 A. M., daily almanac. 12:02 P. M., organ recital from the Stanley Theatre, Arcadia concert orch., Prof. Fori Sarkozi, director. 2, Arcadia concert orch., artist recital by Mr. Charles Silverthorn, baritone; Mrs. Paul R. Gibson, soprano; Marcella North, pianist and accompanist. 4:30, dance program by the Cotton Pickers. 7:30, Arcadia concert orch., Prof. Feri Sarkozi, director.

Sunday, February 1

KOA Denver, Col., 323 (M. S. T.)—11 A. M., solemn mass and sermon. 7:30 P. M., service.

WHAS, Louisville, Ky., 400 (C. S. T.)—9:57 A. M., org. music. 10, church service; Miss Esther Metz, soprano; Mrs. Virginia Shafer Herrick, contralto; Williams Layne Vick, tenor; William G. Meade, baritone. 4 P. M., organ recital by George Limer. 4:30, choral evensong service, men and boys' choir.

KYW, Chicago, 536 (C. S. T.)—6:30 A. M., morning exercises. 9:30, late news and comment of the markets. 10:30, farm and home service. 11:35, table talk by Mrs. Anna J. Peterson. 6:02 P. M., news, financial and final markets. 6:35, children's bedtime story. 7, Joska DeBabary's orch. 7:10, Cron-Sanders Original Nighthawks. 7:20, DeBabary's orch. 8, musical program: Ann H. Swanson, contralto; Oscar Heather, tenor; Indiana Male quartet. 9:05, Youth's Companion. 9:35, "Congress Classic." 12, "Congress Carnival."

KGO, Oakland, Cal., 312 (P. S. T.)—11 A. M., service. 3:30 P. M., KGO Little Symphony orch. 8, special music service.

WIP, Phila., 509 (E. S. T.)—4 P. M., "Our Nation's Greatest Need," by Dr. Francis H. Green. 7:15, evening service. 9:30, Ben Stad.

KSAC, State College, Kan., 341 (C. S. T.)—9 A. M., opening exercises for rural schools. 10, housewives program. 12:30, noonday program. 7:20, College Bell and quartet. 7:30, Spotted Poland China, Hampshire and Berkshire breeds. A. D. Weber. 7:40, Radio College quartet. 7:50, Keeping of Herd Records, J. B. Fitch.

Monday, February 2

WMAQ, Chicago, 447.5 (C. S. T.)—4 P. M., Mothers in Council, by Mrs. Frances M. Ford, one of a weekly series. 4:30, one of the series of talks on English. Mrs. J. Elliott Jenkins. 6, Chicago theatre organ recital. 6:30, violin recital by Milan Lusk. Monday night, silent night.

KGO, Oakland, Cal., 312 (P. S. T.)—9 A. M., music and lectures. 10:40, classroom instruction. 11:30, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports and weather. 3, studio musical program and speaker. 4, Henry Halstead's dance orch. 5:30, Aunt Betty stories and KGO Kiddies' Klub. 6:45, final reading, stock reports, weather. S. F. produce news, and news. 8, educational program; music by the Arion trio; agricultural course, "Some Principles and Facts Concerning Pruning," Professor H. M. Butterfield; "A Lesson in English," Wilda Wilson Church; "The High School Student," Dr. Aurelia Henry Reinhardt; "Chats About New Books," Joseph Henry Jackson. 10, Henry Halstead's orch.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theatre organ, police bulletins, weather, "Just Among Home Folks," readings, late news. 4:55, local livestock, produce and grain market. 5, time announced.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, livestock, fruit and vegetable report, weather. 6, final reading, stock reports, livestock, vegetables and late news. 8, studio program.

WMAQ, Chicago, 447.5 (C. S. T.)—12 P. M., program under Illinois mfg. association. 4, American Red Cross talk by Estelle Weltman, one of a weekly series. 4:30, music. 5, "The Lullaby Lady." 6, Chicago theatre organ. 6:30, Hotel LaSalle orch. 8, Harry Hansen, book review. 8:20, Clara E. Laughlin, travel talk. 8:40, Association of Commerce weekly talk. 8:50, University of Chicago, lecture. 9:15, musical program.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports and weather. 4, concert orch. 6:45, stock reports, weather, S. F. produce news, and news items. 8, P. M., Scouts Minstrels, directed by Arthur C. Toit, San Francisco; specialties: Fred von Elm, violinist; Mrs. Fred von Elm, pianist.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theatre organ, police bulletins, weather, "Just Among Home Folks," readings. 4:55, livestock, produce and grain market. 5, time. 7:30, Carl Zoeller's Melodists, a chapter of the "Billy and Jane" stories, late news, time.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, livestock, fruit and vegetable report, weather. 3, half hour matinee. 6, final reading, stock reports, livestock, vegetables and late news.

KSAC, State College, Kan., 341 (C. S. T.)—9 A. M., opening exercises for rural schools. 10, housewives program. 12:30 P. M., noonday program. 7:20, "College of the Air"; College Bell and music; varieties of Alfalfa. S. C. Salmon; music, under management of Mrs. G. W. Salisbury; Artificial Method and Some Problems to Overcome, L. F. Payne.

Wednesday, February 4

WMAQ, Chicago, 447.5 (C. S. T.)—1 P. M., speeches. 4, beauty talk by Madame Grace Earl. 4:30, program by pupils of Cosmopolitan Music School. 5:30, Armour Institute Musical clubs. 6, Chicago theatre organ recital. 6:30, stories for the children by Georgene Faulkner. 8, weekly lecture Northwestern University. 8:30, piano concerto; artists to be announced. 9, WMAQ players.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports and weather. 3, musical program, and speaker. 4, concert orch. 6:45, final reading, stock reports, weather, S. F. produce news, and news.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theatre organ, police bulletins, weather, "Just Among Home Folks," readings. 4:55, livestock, produce and grain market. 5, time. 7:30, concert by the Tropical Hawaiian Sextette, a chapter of the "Billy and Jane" stories, recitation, James M. Breen; time.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, livestock, fruit and vegetable reports, weather. 6, final reading, stock reports, livestock, vegetables and late news. 8, "Hawaii, the Paradise of the Pacific," by Eben G. Fine and a group of Hawaiian selections, including folk songs.

KSAC, State College, Kansas, 341 (C. S. T.)—9 A. M., opening exercises for rural schools. 10, housewives program. 12:30, noonday program.

Thursday, February 5

WMAQ, Chicago, 447.5 (C. S. T.)—4 P. M., household hour, Mrs. Elizabeth O. Hiller. 4:30, Illinois Federation of Women's clubs. 6, Chicago theatre organ recital. 6:30, Hotel LaSalle orch. 8, talk under the auspices of the Western Railways committee. 8:15, Boy Scout talk. 8:30, to be

announced. 9, lecture from University of Chicago. 9:15, walthor League program.

KGO, Oakland, Cal., 312 (P. S. T.)—10:40 A. M., classroom instruction. 11:30, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports and weather. 4, concert orch. of the Hotel St. Francis, San Francisco, Vinton La Ferrera conducting. 6:45, final reading, stock reports, weather, S. F. produce news, and news items. 8, "Mrs. Temple's Telegram," a farce in three acts. 10, dance music program.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo organ, police bulletins, weather, "Just Among Home Folks," readings. 4:55, livestock, produce and grain market. 5, time. 7:30, concert under Mrs. Robert K. Van Pelt, four-minute digest of International Sunday school lesson, four-minute welfare talk, late news, time.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, livestock, fruit and vegetable report, weather. 3, half hour matinee for housewives. 6, final reading, stock reports, livestock, vegetables and late news.

Friday, February 6

WMAQ, Chicago, 447.5 (C. S. T.)—12:25 P. M., Y. M. C. A. forum. 4, one of a series of talks on English, diction by Mrs. J. Elliott Jenkins. 4:30, pupils of Bush conservatory. 5, "The Lullaby Lady," Mrs. Gene Davenport. 6, organ recital from Chicago theatre. 6:30, Hotel LaSalle orch. 8, Weekly Wide-Awake Club program. 8:30, musical geography, Mr. and Mrs. Marx E. Oberndorfer. 9:15, musical program from Gary, Ind.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 3, studio musical program and speaker. 5:30, the Girls' half hour. 6:45, final reading, stock reports, weather, S. F. produce news, and news.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theatre organ, police bulletins, weather, "Just Among Home Folks," readings, late news. 4:55, local markets. 5, time. 7:30, one-hour concert.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, livestock, fruit and vegetable report, weather. 3, half-hour matinee for housewives. 6, final reading, stock reports, livestock, vegetables and late news. 6:40, Book of Knowledge program. 8, studio program. Complete program of vocal and instrumental solos, duets and quartets; "Road Troubles With the Automobile," by H. L. Johnson.

Saturday, February 7

WMAQ, Chicago, 447.5 (C. S. T.)—2 P. M., Union League Club forum. 6, Young Folks' Catholic association. 8, LaSalle Hotel orch. 8:30, radio photologue, "World Reporting." 9, Weekly theatre revue.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 12:30, final reading, stock reports, weather. 4 P. M., concert orch. 8, "Pirates of Penzance," a comic opera by Gilbert and Sullivan, given through the courtesy of the Pacific States Electric Company; Fred Kickbush, baritone; Marion Vecchi, baritone; Gwymy Jones, tenor; Grace Le Page, soprano; Ruth Waterman, contralto; Beatrice L. Sherwood, soprano; Mary Groom Richards, contralto; Carl Anderson, director; Wilhelmina Wolthus, accompanist. 10, dance music program by Henry Halstead's orch.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., Alamo Theatre organ, police bulletins, weather, "Just Among Home Folks," readings, late news. 4:55, local livestock, produce and grain market. 5, time. 7:30 to 9, concert auspices of Arthur Findling, late news, time.

KOA, Denver, Col., 323 (M. S. T.)—1 P. M., N. Y. stock reports, weather. 9, Joe Mann and his Rainbow Lane orch.

QUICK ACTION CLASSIFIED ADS.

10 CENTS A WORD. 10 WORDS MINIMUM

FOR SALE—Model C Super Heterodyne, wired, in cabinet, used only a short time. \$100.00. Write, S. J. Flick, 534 Ridge Ave., Kensington, Pa.

FOREIGN POSTAGE STAMPS—1,000 all different stamps, only \$1.00. All genuine stamps in good condition. Guaranteed to please or your money back. C. E. Nickles, 2917 Rodman St., Washington, D. C.

AGENTS—Write for free samples. Sell Madison "Better-Made" Shirts for large Manufacturer direct to wearer. No capital or experience required. Many earn \$100 weekly and bonus. MADISON MILLS, 564 Broadway, New York.

DINING & SLEEPING CAR CONDUCTORS (white). Exp. unnecessary. We train you. Send for book of Rules and application. Supt. Railway Exchange, Sta. C, Los Angeles.

"A 3-CIRCUIT TUNER YOU CAN LOG" by Herman Bernard. A 3-tube set that gets speaker DX, described in RADIO WORLD issue of November 8. One stage of radio-frequency ahead of this circuit, making 4 tubes, described by Mr. Bernard in the December 13 issue. 15 cents a copy. Send 30 cents for both to RADIO WORLD.

LOW-LOSS INDUCTANCE FORMS—Linen Impregnated Bakelite. 50c each. The Kehler Radio Laboratories, Abilene, Kansas.

PATENTS—Write for free Guide Books and Record of Invention Blank before disclosing inventions. Send model or sketch of your invention for our prompt Examination and Instruction. No charge for the above information. Radio, Electrical, Chemical, Mechanical and Trademark experts. Victor J. Evans & Co., 294 Ninth, Washington, D. C.

"A VARIOMETER-TUNED REFLEX," by Abner J. Gelula. Three variometers. Three tubes; 1 RF stage, detector, one reflexed audio and one straight audio. Send 15 cents for January 24 issue to RADIO WORLD, 1493 Broadway, New York City.

"A SELECTIVE SIS CRYSTAL SET" by Brewster Lee. Send 15 cents to RADIO WORLD for January 24 issue.

"A \$30 1-TUBE DX SET THAT GETS DX," described by Lieut. Peter V. O'Rourke in January 24 issue. Two controls. Set can be logged. Send 15 cents to RADIO WORLD, 1493 Broadway, New York City, or start your subscription with that number.

A THOUGHT FOR THE WEEK

IF you were an advertiser and wanted to reach an all-radio public, would you use the columns of general publications with a 2% radio reader interest or those of radio publications having a 100% radio reader interest? The answer is as obvious as the bill of a duck.

RADIO WORLD



TELEPHONE LACKAWANNA 6976, 2063

PUBLISHED EVERY WEDNESDAY

(Dated Saturday of same week)

FROM PUBLICATION OFFICE

HENNESSY RADIO PUBLICATIONS CORPORATION
ROLAND BURKE HENNESSY, President
M. B. HENNESSY, Vice-President
FRED S. CLARK, Secretary and Manager
1493 BROADWAY, NEW YORK, N. Y.
(Putnam Bldg., Times Square and 43rd Street)
European Representative: The International News Co.,
Brooma Bldg., Chancery Lane, London, Eng. Paris,
France. Brentano's, 88 Avenue de l'Opera.

EDITOR, Roland Burke Hennessy
MANAGING EDITOR, Herman Bernard
TECHNICAL EDITOR, Abner J. Gelula

SUBSCRIPTION RATES

Fifteen cents a copy. \$6.00 a year. \$3.00 for six months. \$1.50 for three months. Add \$1.00 a year extra for foreign postage. Canada, 50 cents.
Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order, is automatic acknowledgment of their subscription order. Changes of address should be received at this office two weeks before date of publication. Always give old address also. State whether subscription is new or a renewal.

ADVERTISING RATES.

General Advertising		
1 Page, 7 1/2 "x11", 462 lines	.....	\$300.00
1/2 Page, 7 1/2 "x5 1/2", 231 lines	.....	150.00
1/4 Page, 4 1/2 "x7", 115 lines	.....	75.00
1 Column, 2 1/2 "x11", 154 lines	.....	100.00
1 inch	.....	10.00
Per agate line	.....	.75
Times Discounts		
52 consecutive issues	.....	20%
26 times consecutively or E. O. W. one year	.....	15%
4 consecutive issues	.....	10%

CLASSIFIED ADVERTISEMENTS

Ten cents per word. Minimum, 10 words. Cash with order.

Entered as second-class matter, March 28, 1922, at the Post Office at New York, New York, under the act of March 8, 1879.

JANUARY 31, 1925

Popular Pastime Everywhere



DX Fever by Fans With Small Purses Called One of Radio Evils

A NATIONAL survey is being conducted by RADIO WORLD to determine why radio, now ranking thirty-second as an industry, is not nearer the top, as its greatness deserves, and why nearly 80% of the homes in the United States have no radios. Readers of RADIO WORLD are requested to send in their reasons. Letters thus received and published will be paid for at usual rates. Address Survey Editor, RADIO WORLD, 1493 Broadway, New York City.

SURVEY EDITOR:

REPLYING to your invitation to readers to give their views regarding the causes of radio's failure to rank as high commercially as it is entitled to rank by virtue of its inherent greatness, permit me to list my reasons and suggested remedies:

1. The expectations of radio users themselves are too great. Nearly everybody has a fever for distance reception, known as DX, and most persons insist on getting distance, say 1,000 miles or more on the speaker, although they have only 3-tube sets. This necessitates manufacturers catering to this taste. Only regeneration can accomplish these results, and a regenerative set, unless skillfully tuned, not only annoys neighbors, because of radiation, but produces poor quality of reception. Let me specifically emphasize that regeneration can produce good quality, but such sets are tuned by the family at large, and inexperienced hands produce the injurious results I mention.

2. Programs are not of consistently good quality. This is no criticism of the stations themselves, but rather of the lack of a sound economic basis of broadcasting. As stations are supported by advertising, and by nothing else, if the revenue does not justify paid talent, then free talent is exploited, and such performers often, but not always, are of a rather trashy sort.

3. Failure of the manufacturers to unite whereby in production and advertising the emphasis will always be on quality, and DX will be conditionally promised only to users of recognized circuits consistently able to bring in distance, such as the Super-Heterodyne, the Ultra-dyne, the Neutrodyne, some reflexes, and other sets in the multi-tube and non-radiating class. The Super-Heterodyne may radiate, but it can be built so that it will not radiate.

Under all three of these classifications, which I cite in the order of their estimated importance, great difficulties present themselves. No easy solution of any radio problem need be expected. The art is too complex for that.

For instance, under subdivision 1, how can one reform the expectations and desires of the multitudes whose purse limits them to three tubes, or even to only one tube? Hand in hand with the elimination of the regenerative receiver of the popular two and three circuit types goes the denial to these millions of the possibility of hearing distant stations. The solution is to emphasize the quality aspect and ask these teeming multitudes to suppress their DX desire until they can afford a Golden Rule set that will appease it. Meanwhile, however, if interconnection is further developed, so that one excellent program is broadcast simultaneously by numbers of stations, DX desires may be somewhat abated.

Under subdivision 2, the stations derive their benefit from broadcasting either through the advertising advantage accruing to the station owners, such as a department store, radio shop, church, etc.,

or through selling "time" on the air, or both. In some instances great radio corporations maintain the stations to further the sale of radio sets, parts and equipment. It is a fact, indeed, that some of the best programs are those given by concerns that hire "time" on the air, e.g., National Carbon Co., Great Atlantic & Pacific Tea Company, Astor Coffee, Capitol Theater, New York City, Gold Dust Co., Happiness Candy Co. For a sounder economic basis, with sustained quality of programs, huge funds would have to be raised. A tax might have such a deterring effect on radio advancement as to render the experiment too risky. Therefore—what? There is no solution in sight, except the continued use of radio for "indirect advertising," as it is called. If the Victor Talking Machine Co. and other phonograph concerns find that broadcasting by their artists is profitable, in that sale of records and machines increases, and other firms join the field of broadcasting advertisers, conditions will improve. Eventually, however, there will have to be a tax, probably on sales, and levied directly on the manufacturers, and broadcast advertising (unless censored) must cease.

Under subdivision 3 it is, of course, too much to expect that manufacturers will join in a movement at this time to put quality first, for the immediate effect might be a reduction in sales volume. Eventually, however, hundreds of thousands who have no radio set, but who hear sets working in friends' homes, sometimes with distorted reception by home-made circuits and even by manufactured circuits, will be won over to radio. They will hear music and speech received only in pure, clear tones and will not be forced to judge radio by the false evidence everywhere confronting them now. Clear, pure, true, undistorted speaker reception is nothing to marvel at in these days of decidedly perfected radio, and manufacturers should emphasize this fact.

JOSEPHY MULVANEY,
363 Eleventh Street, Brooklyn, N. Y.

New Power Station Opened in Nicaragua

MANAGUA, Nicaragua.

THE Tropical Radio Telegraph Company's new powerful wireless station recently constructed two miles from Managua, was formally opened in the presence of a distinguished assemblage including President Solorzano of Nicaragua, cabinet officers, diplomatic and church officials.

The first message of greeting over the new South American radio system was sent by President Solorzano to President Coolidge, the second by Dr. Salvador Castrillo, minister of foreign affairs, to Secretary of State Hughes, and the third was reserved for the Associated Press. Both President Coolidge and Mr. Hughes replied to the greetings of the Nicaraguan officials.

The new wireless station occupies a site of 1,400 acres on Lake Managua and is said to represent an expenditure of more than \$350,000. The station was christened by breaking a bottle of champagne over the base of the huge tower. Special trains were run from Managua to carry the crowds to the ceremony, and champagne was served to all.

Wireless stations are also being erected at Bluefields and Gracias a Dios, Nicaragua, and all stations will work direct with New Orleans, Swan Island and Miami.

The Radio Trade

Percy A. Rockefeller Backs Recapitalization of Music Master

500,000 Shares Now Instead of 10,000—Brunswick Listed on the Big Board—Profits Shown as \$1,497,266 Net for Nine Months Up to September—Big Business Attached to Radio Concerns—Table Shows Market Price Movement of Stocks for Year.

PRE-EMINENCE of the radio industry as a magnet which is attracting capital both from the general public and from prominent financiers is demonstrated in several announcements having to do with this business. One of these developments dealt with the recapitalization of the Music Master Corporation under the auspices of influential Wall street bankers. Other

interesting facts were revealed from various sources concerning the outlook for radio expansion, and the popularity of radio stocks with the speculating and investing public. Recapitalization of the Music Master Corporation will provide for the entrance into the company's affairs of new financial interests. Old capitalization of 2,500 shares 7 per cent. preferred and 7,500 shares no par value common has been retired, and will be replaced by 500,000 shares no par common, of which 450,000 shares

will be outstanding. It is expected an offering of 150,000 shares will be made shortly and the stock will be listed on the market. H. D. Williams & Co., Stock Exchange members, will handle the sale.

Among the new banking interests identified with the company are Percy A. Rockefeller, (Concluded on next page)

Radio EUREKA Radio DIAL POINTER

Beautifully your set by installing the Eureka Dial Pointers. You save eyestrain and eliminate guess-work in logging your stations.

10c each
Screws
fast to
Panel



Gilt or
Nickel
finish

Obtain at your dealer's or send 10c in stamps for each sample desired.

Manufactured by C. W. BUTTS, Inc.
42 Hedden Place East Orange, N. J.

Responsible jobber wanted in each city.



You
Can
Build

This Set Without Soldering

Save fifty dollars!

Don't pay the other fellow for doing what you can do yourself. Build your own Radio set—and have the fun of building it! The Elgin Super-Reinartz is supplied "knocked down." But it is different from the average so-called knocked down set.

Everything is drilled, the panel is engraved—and there is absolutely nothing to solder. The parts assemble just like building blocks, all wires "clip" into place and the panel slides in the grooved cabinet and fits! Nothing to do but drive a few screws!

If you can use a screw driver you can build this highly efficient receiving set in an hour or so. Then call in your friends and show them the set you built yourself! Show them how easy it is to tune in the stations they have been unable to get with ordinary sets.

The Elgin Super-Reinartz is the set that has repeatedly tuned in 2LO, the hard-to-get London station. This same set has logged every worth-while station in the United States, Canada, Mexico and Cuba.

The parts supplied you are exact duplicates of the parts we used in the original model, the hook-up is the same and an exact simplified working drawing is supplied. You can't go wrong.

We guarantee every part in the Elgin Super-Reinartz to be the utmost in efficiency. We guarantee the drawings furnished you to be duplicates of the same set that heard London. We guarantee reception that is only equalled by sets twice the size and price, providing our drawings are followed and the set is properly constructed as we direct! Feed our FREE offer to you.

FREE!

We want you to learn more about this amazing set—mail the coupon with your name and address and we will send you the complete working drawings of the Elgin Super-Reinartz — absolutely FREE!



RADIO Storage "B" Battery
Lasts Indefinitely—Pays for Itself

Economy and performance unheard of before. Recharged at a negligible cost. Approved and listed as Standard by leading Radio Authorities, including Pop. Radio Laboratories, Pop. Sci. Inst., Standard Radio News Lab., Leafax, Inc. and other important institutions. Equipped with Solid Rubber Case, an insurance against acid and leakage. Extra heavy glass jars. Heavy rugged plates. Order yours today!

SEND NO MONEY Just state number of batteries wanted and we will ship day order is received. Extra Offer: 4 batteries in series (96 volts), \$18. Pay expressman after examining batteries. 5 per cent discount for cash with order. Mail your order now!

WORLD BATTERY COMPANY
1219 So. Wabash Ave., Dept. 82, Chicago, Ill.
Makers of the Famous World Radio "A" Storage Battery
Prices: 6-volt, 100 Amp. \$18.00; 120 Amp. \$14.00; 140 Amp. \$18.00.
All equipped with Solid Rubber Base.

World FOR STORAGE BATTERIES RADIO



KOKA - WEAF - WGN - WJS - KHJ - KGO - KFAF - WJY - KOP

ELGIN Super-Reinartz
The Ford of Radio

Send This Off
Elgin Radio Supply Company,
Suite B, 207 E. Chicago St., ELGIN, ILL.
I want to know all about the set that heard London. Send the working drawings of the Elgin Super-Reinartz set by return mail—Free! I am enclosing a stamp to cover postage.

Name

Address

Do You Want a Radio Publication Gratis? For NEW RADIO WORLD Subscribers Ordering NOW

Radio World has made arrangements

This is the way to get two publications

- To offer a year's subscription for any one of the following publications
- with one year's subscription for RADIO WORLD
- RADIO NEWS or
- POPULAR RADIO or
- RADIO BROADCAST or
- WIRELESS AGE or
- RADIO DEALER or
- RADIO JOURNAL or
- RADIO (San Francisco) or
- BOYS' LIFE

- for the price of one:
- Send \$6.00 today for RADIO WORLD
- for one year (regular price)
- for 52 numbers)
- and select any one of the other
- eight publications for twelve months.
- Add \$1.00 a year extra for
- Canadian or Foreign postage.
- Present RADIO WORLD subscribers
- can take advantage of this offer by
- extending subscriptions one year
- if they send renewals NOW.

RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE SUBSCRIPTION BLANK

RADIO WORLD, 1493 Broadway, New York City
Enclosed find \$6.00, for which send me RADIO WORLD for twelve months (52 numbers), beginning..... and also without additional cost, Radio News, or Popular Radio, or Radio Broadcast, or Wireless Age, or Radio Dealer, or Radio Journal, or two yearly subscriptions.

Indicate if renewal.
Offer Good Until
February 10, 1925

Name

Street Address

City and State

MR. DX HOUND

A Character Created by RADIO WORLD Artist

By HAL SINCLAIR



DeForest Sues to Stop Sale of Tubes As Fraudulent

THE Broadway Trust Company, Camden Glass Works and Rosenthal Electrical Laboratory, all of Camden, N. J., were joined as defendants in an action charging conspiracy, commercial fraud and infringement of the trade names as well as misrepresentation and fraud of the patents of the De Forest Radio Company, and an application for a preliminary injunction filed in the United States District Court of New Jersey at Camden by counsel for De Forest.

The petition alleges that the Camden Glass Works and Rosenthal Electrical Laboratory, financed by the Broadway Trust Company, conspired in the manufacture and merchandising of spurious and infringing thermionic vacuum tubes or "audions," misrepresenting these tubes to retailers upon the tube itself and upon the cartons in which they were proffered for sale as being the product of the De Forest Radio Company, Jersey City, owners of the basic patents on the thermionic vacuum tube of Dr. Lee De Forest.

The retail radio market is said to have been flooded, especially New York and other large cities, with an infringing tube known as the "O-T" type of tube alleged to have been manufactured by the De Forest company and said to possess the characteristics of the vacuum tube manufactured and merchandised by the De Forest Company. This tube was sold at a cut price and because of its construction and service is alleged to have worked a hardship upon the genuine De Forest "audion" tube with which it was in competition.

Officials of the Broadway Trust Company denied their connection with the alleged conspiracy, infringement and commercial fraud.

GERNSBACH'S AIRPHONE CORP. OFFERS STOCK

A BRAHAMS, HOFFER & CO., 15 Broad Street, members of the N. Y. Curb Market, are advertising for sale stock of the National Airphone Corporation, Hugo Gernsbach, editor of "Radio News," president, and Sol J. Van Wezel, treasurer.

NOVEMBER EXPORTS \$948,993; HIGHEST FOR ANY ONE MONTH WASHINGTON.

RADIO exports during November reach a new high total for any one month of \$948,993. Exports for October were \$759,249. The biggest buyers of radio apparatus during November were Canada, Australia, Mexico, England, Cuba, Argentina and Japan.

Coming Events

FEBRUARY 18-22—Radio Exposition, State Armory, Syracuse, N. Y.

MARCH 4—Broadcasting of President Coolidge's inaugural speech.

APRIL 22-28—Third District Radio Convention, Steel Pier, Atlantic City, N. J.

SEPTEMBER—Second Radio World's Fair, New York City.

Music Master Reorganization

(Concluded from preceding page)

Samuel E. Pryor, Matthew C. Brush, E. R. Harriman and William T. Smith.

With the exception of Mr. Rockefeller, these capitalists were elected directors. H. D. Williams was also made a member of the board.

Announcement of the recapitalization stated the company had recently purchased more acreage near Philadelphia, where its headquarters are located, on which it plans to erect its principal manufacturing plant.

Brunswick-Balke-Collender common stock, consisting of 500,000 shares, no par value, was listed on the Stock Exchange. Figures submitted to the exchange showed \$1,497,266 net profits of the company for the nine months ended September. The company manufactures and sells the Brunswick Radiola.

Bright Prospects

Statistics and comment describing the past growth and future outlook of the radio industry were given in the current circular of Carden, Green & Co., in which George A. Carden, a member of the firm, stated as follows:—

"The near term prospect for the radio apparatus manufacturing industry is becoming increasingly bright. On the basis of orders already on hand practically all of the leading companies will be forced to operate their plants at capacity during the first quarter of 1925. Indeed, in several instances extensive factory additions are being made necessary by the strong demand. Total business in the first three months of this year promises to nearly equal that for the first six months of 1924."

Review of 1924

The review shows that the shares of more than twenty-five different concerns manufacturing complete radio sets and their accessories are traded in on the public exchanges. Those engaged in radio exclusively and their price movement in 1924 are given in the table below:—

1924 Price Range

	High	Low	Close
Chas. Freshman	23 1/2	21 1/2	23 1/2
De Forest Radio	28	21	26
Dubilier C. & R.	68	10 1/2	67 1/2
Duplex C. & R.	12 1/2	11	12 1/2
Freed-Eisemann	33 1/2	27 1/2	32
Hazeltine	48 1/2	13	48
Inter-Ocean	16 1/2	12	12 1/2
Jones Radio	10 1/2	7 1/2	7 1/2
Liberty Radio	8	5 1/2	8
*Radio Corporation	66 1/2	16 1/2	64 1/2
*Radio Corporation pf.	50	39 1/2	50
Rova Radio	18	9 1/2	12
Sleeper Radio	17	15	17
Thermodyne	19 1/2	12	19 1/2
Thompson	21	7	20 1/2
Tower Mfg.	28 1/2	18 1/2	23
Ware Radio	39 1/2	13 1/2	39 1/2

*Listed on N. Y. Stock Exchange.

Custeloid Speaker

A UNIQUE and beautiful loudspeaker that ranks with the best in tonal quality and voice reproduction is being placed on the market by the Custeloid Company, Inc., Ozone Park, N. Y. It is made of Custeloid, a durable material that closely resembles the highest quality tortoise-shell in all its beauty. One model is a cabinet reproduction of a 17th Century Venetian jewel case. It is 12" long, 5" wide and 5" deep, richly chased and ornamented with deep gold banding so it will harmonize with the most sumptuous of surroundings. Two other styles are flower vases with compartments for artificial flowers. In all models, the units stood up to the hardest tests, being perfect in all tonal harmonics, standing the fullest flow of power.

(Tested and approved by RADIO WORLD)

New Corporations

Armley Radio Corp., Dover, Del. \$15,000,000 (U. S. Corp. Co.)

Arlington Moulded Radio Cabinet Panel and Base Corp., New York City. 100 shares of common, no par. H. Respass, C. Gardner. (Atty., W. R. Respass, 500 5th Ave.)

Trianola Radio Corp., Brooklyn, N. Y. 1,000 shares common, no par. H. J. Frey, A. Ciano. (Atty., F. A. Crowe, 180 Montague St., Brooklyn, N. Y.)

M. Pudlin Co., New York City. 50 shares at \$100 each, 20 common, no par. S. A. Fried, M. H. Michaels. (Atty., L. Lipskin, 291 Broadway, New York City.)

Business Opportunities Radio and Electrical

Rates: 50c a line; Minimum, \$1.00

RADIO SALES STAFF, fully acquainted with the trade in western New York and western Pennsylvania, headquarters in Buffalo, would like to represent manufacturers having either a good low-priced, medium-priced or high-priced set. Write us fully what you have to offer.

PAR-ALL Mfg. Co. Bramson Bldg., Buffalo, N. Y.

RADIO CAPITAL FOR EXPANSION.

A company which has been successfully manufacturing radio parts and sets for several years in another section of the country and having wonderful success with their four-tube radio and audio frequency sets and their coast-to-coast "Balanced Five" is planning to move to New York or vicinity for expansion purposes. This company has several important improvements and is in need of \$25,000 to \$50,000 with which to take care of increase in business, either silent or working partner. Prefer sales executive or manufacturer. Box XZ, Radio World.

RADIO MANUFACTURING COMPANY firmly established, unlimited possibilities, can use from \$20,000 to \$50,000 for expansion; huge business already on hand; party supplying same will be treated fairly; bank reference given and expected. Box 1XZ, Radio World.

RADIO STORE; EXCELLENT BUSINESS section, East Bronx; have other business, cannot attend to this store; will consider any reasonable offer. Box 2XZ, Radio World.

RADIO LOUD SPEAKER AND HORN FACTORY for sale reasonable. 525 East 15th St., N. Y. C.

RADIO MANUFACTURING COMPANY, going concern, already doing good business; can use one or two men who can invest from \$10,000 to \$20,000; position to carry salary. Box 3XZ, Radio World.

RADIO CONCESSION, COMMISSION BASIS; large drug store, uptown. Box 4XZ, Radio World.

"ADDING ONE STAGE OF AF" explained in Radio World, issue of Oct. 18. Send 15 cents. Radio World, 1493 Broadway, N. Y. C.

Controls Are Kept Down to Three

(Concluded from page 4)

second tube, the other side of N2 to the 35th turn tap on L6.

Interrupt the A battery minus, near the battery connection, with the filament switch S.

How to Make the Coils

The coils are wound on a basketweave form consisting of 15 dowel sticks, each 4" high and evenly distributed around a 3-inch circumference. The straight distance between two points is 5/8". The dowels are mounted on a 4x4" baseboard, at right angles to it. In the board 1/4" holes are drilled nearly all the way through the 15 points. Wind the wire under two dowels, then under two dowels. Secure the coil by passing linen twine down one side and up the other side of the angles formed by the wire at each of the 15 points. Knot separate tie-strings.

The aerial coupling coil, L1L2, is a continuous winding of 50 turns of No. 20 DCC wire, tapped at the eighth turn from the beginning and every quarter turn from the next two turns (ninth and tenth). L3L4 is made as follows: Cut a 4 ft. length of this same wire and wind it, and the wire from the spool, at the same time, side by side, until 8 turns are completed. Leave the short length of wire aside and continue winding only the wire from the spool. Continue the winding until the 35th turn, at which point a tap-loop is made. Continue by putting on 13 more turns and then every quarter turn on the next two turns. Terminate. The tap at the 35th turn is for connection to one side of the neutralizing condenser, the other side of the neutralizing condenser going to the grid of the preceding tube. The quarter turn taps are for obtaining exactly the correct inductance on L2 and

L4 so that the common condenser that tunes both the coils may be connected to the correct tap so that one dial setting represents one wavelength and not two. Experiment will determine the correct tap to use for connection to the tuning condenser C1.

L5L6 is made like L3L4, except that the quarter-turn taps are omitted.

LIST OF PARTS

- One lb. No. 22 DCC wire.
- One No. 18 Bruno ultra vario condenser (C1).
- Two .0005 low-loss variable condensers (C2, C3).
- Two neutralizing condensers (N1, N2).
- One single-circuit jack (J2).
- One double-circuit jack (J1).
- Three 4" dials.
- Five sockets.
- Five 201A tubes.
- Two Federal audio-frequency transformers, No. 65 for first stage, 65A for second.
- Two No. 1-A Amperite self-adjusting rheostats (R1, R3).
- One 6-ohm rheostat (R2).
- One 75-turn duolateral or honeycomb coil, with panel mount (L7).
- Fixed condensers: two .001 mfd. (C4, C6), one .00025 mfd. (C5).
- One Turnit (variable grid leak).
- One 7 x 24" Radion panel.
- One 6 1/2 x 20" baseboard.
- Three 4" dials.
- One 4 1/2-volt C battery.
- Two 45-volt B batteries.
- One filament switch (S).
- One 120-ampere-hour 6-volt storage A battery.

FREE!

Everyone Interested in RADIO Should Write for this FREE Radio Book

The Greatest Bargain Catalogue published. Chuck full of thousands of Radio Bargains at the lowest prices to be found anywhere in the United States.

Parts, Supplies, Sots, Parts for Sots, Latest Circuits.

Send for this catalogue TO-DAY.

We have friends in every City, Town and Hamlet. Our reputation is our bond. No Fed tags—honest merchandise, goods shipped on approval. No risk—satisfaction or money refunded. No arguments, no money in advance. Ask this magazine about us!

Wholesale Radio Service
Dept. B
1 Church St. New York City

AIR SERVICE
AMERICAN INTERSTATE RADIO

"A" THING OF JOY AND A JOY FOREVER."

5 TUBE TYPE 5A \$50

183 Greenwich St., N. Y. C.

RADIO Buyers' GUIDE

For Consumers Get it now—before you buy any set or parts to build one. Bargains in all kinds of complete sets, parts and accessories. (Will you be so kind as to add the names of one or more friends you believe will soon want such goods? Thank you!)

FREE 100 Pages Just send your name.

Liberty M. O. House, Dept. E-681 Liberty St., N.Y.

ACME POWR-BEE

Better Than "B" Battery

NO HUM NO NOISE

Reduces the cost of radio at your dealers or write

THE ACME ENGINEERING CO.
Dept. B LOUISVILLE, KY.

Dealers write for big sales proposition

Make \$100 a Day

FREE INSTRUCTION TELLS HOW

Many Sales Are Half Profit When you sell our nationally advertised radio sets and supplies. We Guarantee your success under the "Gould Plan," by allowing you to return goods which you do not sell. It would pay you to get our price list and free instructions "How To Sell Radio." Write for it.

Federal Radio Co. 103 East 13th St. Kansas City, Mo.

FRESHMAN MASTERPIECE

A 5-Tube, Tuned Radio Frequency Receiver that represents the greatest value ever offered in \$60 a radio set

Write for particulars.

CHAS. FRESHMAN CO., INC.
FRESHMAN BUILDING
240-248 W. 40th ST., NEW YORK

GENUINE MAHOGANY CABINET

IS GIVEN with every complete set of parts for PRESSLEY SUPERHETERODYNE, sold by us.

This was omitted from our ad on page 23, RADIO WORLD of January 24th.

WALLACE RADIO COMPANY, Inc.
135 Liberty Street New York City

Set in Bank Vault Hears WOC

JEFFERSON CITY, MO.

RADIO station WOS announced the receipt of a letter from the First Savings Bank at Palmyra, Mo., saying that a program from WOS had been received on a Super-Heterodyne set placed inside the bank's vault. The letter said that the vault's walls were twenty-seven inches of steel and concrete and that during the reception of the program the ten-ton steel door was closed.

THE CONNOR "B" BATTERY

THE Connor Rechargeable B Battery Co., of Van Wyck Ave., Richmond Hill, N. Y., has placed upon the market a 100-volt, 2,200-milliamperere storage B battery, excellent in appearance and efficiency. The battery has lead plates and uses a 1,250-electrolyte. The entire battery presents a neat appearance, being contained in a leak-proof mahogany cabinet. The battery is shipped dry, so as to prevent any deterioration and insuring the consumer a brand new article. The battery may be filled easily by purchasing of any battery supply station a small quantity of 1,250 electrolyte.

\$2.00 EACH **LOUD SPEAKER RADIO TUBES**

Each tube is guaranteed or your money returned.

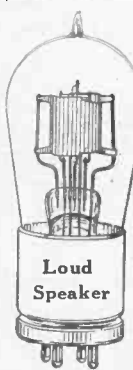
WE SPECIALIZE IN Mail Orders

Send No Money, Simply Pay the Postman.

If You Care to Send Cash, I Pay Postage.

Canada, Thirty Cents Extra

James H. Konkle
192 MARKET STREET
NEWARK, N. J.



Gets Across "Bruno"

PRECISION INSTRUMENTS



LATEST PATENTS

WASHINGTON.

SIXTEEN patents on radio inventions were granted by the U. S. Patent Office during the past week. Five of these patents went to C. Francis Jenkins on his invention for the transmission and reception of pictures by radio. A brief description of some of the other patents granted follows:

Signaling System (No. 1,521,018) invented by H. L. Godfrey, of Wilkensburg, Pa., and assigned

to the Westinghouse E. & M. Co. A frequency trap when opened enables the energy to be radiated from system, and when closed affords a substantially infinite impedance to the antenna circuit.

Electron Discharge Amplifier (No. 1,520,994) invented by Harold D. Arnold, of Maplewood, N. J., and assigned to Western Elec. Co. Provides means whereby the ratio of amplification can be varied without varying the impedance presented by the amplifier as a whole to the impulses which are to be amplified.

Electric Ground Clamp (No. 1,520,868) invented by Raymond M. Hutton, of Philadelphia, Pa. Provides an improved electric ground clamp which will facilitate the grounding and bonding of electric conduit and other piping.

Method of Receiving Electrical Oscillations (No. 1,520,835) invented by Alexander Meissner, of Berlin, Germany. Heterodynes received current so as to strengthen the vibrations in the telephone receivers.

Process for Finishing Panels for radio sets (No. 1,521,096) invented by Paul M. Hennegan, of Cin-

cinnati, Ohio. Relates to the marking of radio panels.

Combined Radio and Phonograph Amplifier and tone control therefor (No. 1,521,366) invented by Alfred H. Haag, of Baltimore, Md. Permits the phonograph amplifier to be used as a loud speaker for radio reception.

Receiving System (No. 1,521,380) invented by David G. McCaa, of Lancaster, Pa., and assigned to the Electric Apparatus Co. Reduces static, strays and other natural or artificial disturbances including other radio signals.

Synchronizing Rotating Bodies (No. 1, 521,205) W. S. Stephenson and George W. Walton, of London, England. Means for maintaining two rotating bodies spaced a distance apart in synchronism by the use of wireless or electromagnetic waves.

Transformer (No. 1,521,252) invented by E. N. A. Rauland, of Chicago, Ill. Provides a simple and sturdy transformer of compact design.

Telephone Headset (No. 1,521,275) invented by G. W. Carpenter and Wendell L. Carlson of Schenectady, N. Y. Shields the telephone cords of the headset from strays or other external interference.

Fixed and Variable Gridleak (No. 1,521,213) invented by S. N. Baruch, of New York, N. Y. Provides a variable high resistance for radio circuits with little or no microphonic characteristics.

(Copyright, 1924)



Genuine MASTERTONE TUBES Reduced

SIMPLY TO INTRODUCE THEM

Type M12, 199A

Type M199

Type M200, Type M201A

LIST, \$4.00
NET, 2.00



All Tubes Guaranteed.
Agents and Dealers Wanted.

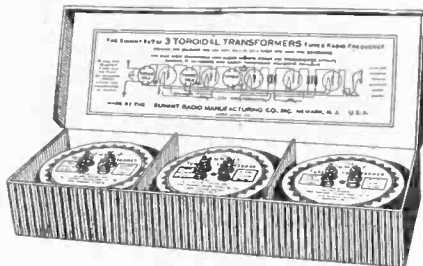
RADIOTUBE COMPANY

903 BROAD STREET

NEWARK, N. J.

At Last! Toroidal Radio Frequency Transformer

The "doughnut" or toroid coil is simplicity itself and represents a new step in tuned radio frequency amplification. To the discriminating Radio Fan who demands the utmost of his receiver from the standpoint of distance, selectivity, sensitivity and volume, the SUMMIT TOROIDAL TRANSFORMERS will prove a revelation. They are designed in accordance with modern transformer engineering principles, adding greatly to the efficiency of any receiver.



The SUMMIT TOROIDAL TRANSFORMERS are used in exactly the same manner as the open radio frequency coils—they have a correct ratio and are self-neutralized and self-balanced. There are no stray fields, leakages, nor can they feed back, thus assuring the experimenter and radio set builder of correct operation without howling or squealing. The low distributed capacity and low loss

assures the greatest distance and power possible.

Diagrams and complete instructions for the assembly of the Five-Tube Summit Receiver enclosed with each set of Transformers. The beginner in radio set building (if he follows these instructions) will experience no difficulty in producing a finished set that will do all and more than any other set of like size.

List Price (Set of Three) \$10.00
Mated Units

TERRITORY OPEN TO JOBBERS AND DISTRIBUTORS

SUMMIT RADIO MANUFACTURING CO., Inc.

481 BROAD STREET

Dept. 25

NEWARK, N. J.

FILL OUT AND MAIL NOW SUBSCRIPTION BLANK RADIO WORLD

RADIO WORLD

1493 Broadway, New York City

Please send me RADIO WORLD for months, for which please find enclosed \$.....

SUBSCRIPTION RATES:

Single Copy \$.15
Three Months 1.50
Six Months 3.00
One Year, 52 Issues 6.00
Add \$1.00 a Year to Foreign Postage; 50c for Canadian Postage.

Wright's Reflex

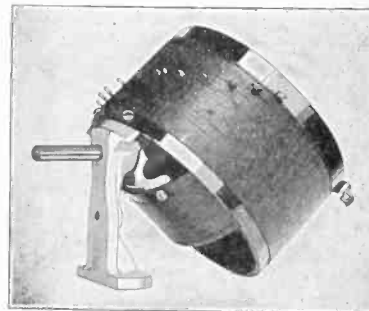
(Concluded from page 7)

from my home in Baltimore. KHJ, Los Angeles, and KGO, Oakland, can be heard almost any night.

If good results are not obtained reverse the connections to the primary (L3) of the second radio-frequency transformer. The upper end of the secondary goes to the grid and the lower end to the positive A. The primary connections must be determined by actual trial. The audio-frequency transformer must be of a good standard make as some of the cheaper ones fall down miserably when it comes to handling the heavy currents in reflex circuits. I used the Erla 6-to-1.

TRI-DOT

180° UNDERCUT STATOR



THE TUNER THAT MADE THE
DX SPECIAL SET

FAMOUS ALMOST OVERNIGHT

THIS SPECIAL TUNER ENABLED THE manufacturers of the DX Special Set to guarantee two thousand miles on their sets.

SENT POSTPAID ON RECEIPT OF \$2.00

TRI-DOT

ELECTRIC CO., INC.

16 HUDSON ST., NEW YORK CITY

COMPLETE 1924 INDEX OF RADIO WORLD, appeared in RADIO WORLD dated Oct. 18, 1924, and Jan. 10, 1925. 15c per copy. RADIO WORLD, 1493 B'way, N. Y.

BUY, SELL, EXCHANGE? Use RADIO WORLD'S Classified Department, RADIO WORLD, 1493 Broadway, N. Y.

One of My Happiest Days, Alda's Words in Her First Broadcast

FRANCES ALDA of the Metropolitan Opera Company appeared for the



GRACEFUL skater. The miss of the many icy graces is Esther Smith and the scene of her frost-defying antics is the gray ice of Poland Springs, Me. To the tune of some rhythmic waltz she cuts some figure (No. 8 is the appearance), cavorting as the dancing debutante of the glistening steel and (to us) treacherous highway of winter sport. (Fotograms).

the applause to which she had so long been accustomed at the Metropolitan Opera House.

This was the second program of the series arranged by the Victor Company and begun by John McCormack and Lucrezia Bori on New Year's night. The assisting artists when Mme. Alda appeared were Frank La Forge, the Florentine Quartet and the Victor Concert Orchestra, Rosario Bourdon conducting.

"Better Than an Aerial"

Say Many Fans and Dealers of THE

PARAMOUNT LOOP LIST PRICE \$12

A Marvelous New Antenna, the Popularity of Which is Fairly Sweeping the Country.

Spider-web wound with silk over phosphor-bronze wire on genuine Bakelite frame, the PARAMOUNT LOOP gathers and sends direct to the receiver every electron of current, producing

- GREATER VOLUME!**
- GREATER CLARITY!**
- GREATER DIRECTIONAL EFFECT!**
- GREATER RECEIVABILITY!**

For results that will add still greater delight to your "Radio Afternoon or Evening."

Order a PARAMOUNT LOOP from Your Dealer—or Direct from the Manufacturer—To-day!

PARAMOUNT RADIO CORP.
23 Central Avenue, Dept. R.W., Newark, N. J.
Big Opportunity for Dealers.

CERTIFIED COILS
FOR
Radio World's 1925 Model Superdyne
KOIL KIT COMPLETE \$7.00

1—3 Circuit Superdyne Coupler
1—Superdyne R.F. Transformer

Both Units are All-Lits Wound on Bakelite Base

ARC RAD PRODUCTS
48 So. 7th Street NEWARK, N. J.

The "Goode" Two-o-One



Le Ton d'argent

Guaranteed



BY MAIL ONLY

\$2.39

Postpaid

QUARTER AMPERE AMPLIFIER-DETECTOR RADIO TUBE

GUARANTEED SATISFACTORY

All "GOODE" Tubes Sold Direct to the Consumer—No Dealer Profits

ONE—"Goode" Detector-Amplifier **\$2.39**

THREE—"Goode" Detector-Amplifiers **\$6.42**
(All Postage Prepaid)

The "Goode" Two-o-One A Tube amplifies or detects. It is a quarter ampere, five volts, standard base, silvered tube.

Send express or postal money order or New York draft to—

The Goode Tube Corporation
Incorporated Dept. B
OWENSBORO KENTUCKY

first time in her career before the microphone being heard in a group of songs through Station WEAf by an audience estimated as between six and seven millions. The recital was broadcast from the studio at 195 Broadway, New York City, and relayed by telephone lines through seven other radio stations as the Victor Hour of Music. It was a continuation of the Victor Talking Machine Company's experiment in stimulating sales of phonographs and records.

The opera singer was introduced to the unseen audience shortly after 9 o'clock. Her first number was "Michiamano Mimi," from the opera "Boheme," after which she sang "L'Altra Notte," from "Mefistofele." Mme. Alda's last two selections were "Mighty Lak' a Rose" and "What'll I Do?"

At the close Mme. Alda spoke to her radio audience as follows:

"If it has given you, my unseen, unheard audience, one-half the pleasure to listen that it has given to sing for you, this will be one of my happiest days."

Telegram of appreciation from the "listeners in" began to pour into the studio shortly after Mme. Alda's first number. One that seemed to please her most was from a young friend, Barrie Thompson, a ten-year-old lad of Toronto, who said that her voice sounded fine.

Mme. Alda said after the recital that she was delighted over the experience, and that at the close of each number she felt instinctively like bowing and waiting for



ROYALTRONS NOW \$3.00

Approved by Radio News Laboratories

TYPES

- 400—6 V. 1/2 Amp.—Det.
- 401A—6 V. 3/4 Amp.—Det. and Amp.
- 412—1 1/2 V. 1/4 Amp.—Det. and Amp.
- 499—3 V. .06 Amp.—Det. and Amp.
- 402—Transmitter.

At all good dealers. Every ROYALTRON must give satisfaction.

ROYAL MFG. CO.
Dept. RW, 208 Broadway, New York City

Make BIG MONEY! IN RADIO

We Need Men—Can You Qualify?

Ozarka representatives make real money because they give real values and deliver a real service. For instance, there is a 4-tube Ozarka Instrument for loud speaker operation, giving wide range of reception at \$39.50. Our men demonstrate Ozarka Instruments and Install. The Instrument makes the sale easy by its performance. We train you to know radio and our methods, make you worthy to wear the Ozarka button as our accredited representative. Previous experience is not necessary. In fact we prefer to do our own educating. If you have a clean record, are industrious, and have saved up a little cash, here's a real opportunity, if you can qualify for an exclusive territory. We already have 224 representatives. Territory going fast.

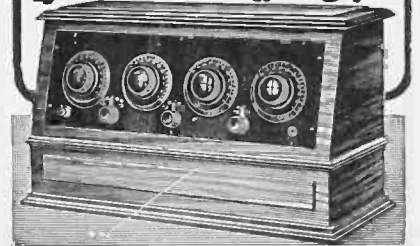
FREE, LARGE Illustrated BOOK



WRITE Today for illustrated book No. 101 that gives the entire Ozarka Plan. Don't fail to give the name of your county.

OZARKA, Inc.
842 Washington Blvd.
CHICAGO

4 Tube Sets As Low as \$39.50



Tieup of Printed Word and Radio a Success

AN experiment in linking up radio and the printed page which has been carried out by the Westinghouse companies and the Houston Publishing Company, Inc., has proved a great success, according to Herbert S. Houston.

A 1,000-word summary of foreign affairs called "The World Through the Air," is broadcast every Monday night from all the Westinghouse stations, under this arrangement, and this is followed up on Thursday with the issue of Our World Weekly, which expands the account of the state of the world to 2,500 words and prints it again under the heading, "The World Through the Air."

"It is the first time, so far as I know," said Mr. Houston, "that the printed word and radio have been made to work together as allies to their mutual advantage in just this manner."

"There has been a great deal of talk of competition between the radio and the newspapers and between the radio and various forms of entertainment. No one can tell just what will develop, but I believe that radio and the press will be allies, each benefitting the other, as indicated by this experiment."

"I took up the idea of broadcasting this talk with the Westinghouse officials several months ago. The reaction of the listening public was one of great interest."

RADIO WORLD has linked up directly with broadcasting by having its experts

discuss radio technique from WGBS, 316 meters, New York City, every Friday at 6:30 p. m. This is done through the courtesy of Gimbel Bros. Department Store, New York City. The result has been highly successful, the number of letters received, containing radio questions or requests for diagrams, exceeding 200 some weeks. All questions are answered either over the air, by mail or in the columns of RADIO WORLD.

Radio Fails as Rescuer of Entombed Miners

WASHINGTON.

RADIO as a means of communication between entombed miners and surface rescue parties has proved impracticable, Interior Department announced in describing Bureau of Mines experiments extending over several years.

High power equipment necessary for communication over distances of even 1,000 to 2,000 feet through strata, the bureau said, would be too bulky, heavy and complicated, and at the same time too fragile and delicate for practical requirements.

It was stated, however, that there was some promise in the application of "wired wireless," or line radio, which consists of transmission along metallic conductors, such as water pipes, compressed air pipes, power and lighting circuits and mine car tracks.

Drug Addicts Aided by Listening In

ALBANY, N. Y.

RADIO entertainment provided for the drug addict inmates of the New York City municipal farm of Rikers Island has had a beneficial effect upon the discipline of the institution, according to an inspection report made public here by the State Commission of Prisons.

Funds for the radio outfit were obtained from the profits of the Commissary Department, and sets were installed in each dormitory, with a central control in the residence of Warden Robert Barr. A microphone in his residence also enables him to address the inmates at any time, or give instructions to officers or inmates.

PACENT ASKS FOR INJUNCTION; ALLEGES PLUG INFRINGEMENT

ACTIONS against seven radio manufacturers and two radio dealers were instituted in Federal Court, New York City, by the Pacent Electric Company for alleged infringement of radio plug patents. Pacent seeks a permanent injunction restraining the defendants from further alleged infringement and also prays that triple damages be assessed in accordance with the provisions of the patent law.

The first basic patent on plug design, it is said, was issued to Louis G. Pacent, president of the company, its inventor, on January 8, 1924. This was followed by a second patent on June 17, 1924.

Four radio corporations have been licensed under the plug patent: L. S. Brach Manufacturing Company, the Leslie F. Muter Company and the Beacon Radio Mfg. Co., Inc.

The defendants in the actions are The Saturn Mfg. & Sales Co., Inc., New York City (manufacturers), Consolidated Instrument Co. of America, New York City (manufacturers), Preferred Radio Products Corp., New York City (manufacturers), Joseph Wildenberg and Jacob Wildenberg trading as W. B. Manufacturing Co., New York City (manufacturers), Presto Machine Products Co., Brooklyn, N. Y., (manufacturers), Mortimer Springarn, trading as Borough Hall Supply Co., Brooklyn (dealers), and Samuel A. Paris, trading as Kings Radio Service, Brooklyn (dealers).

For Crystal Set Owners

Illustrated articles on the making and use of crystal sets appeared in Radio World dated Dec. 6, 20 and 27, 1924, and Jan. 24, 1925. 15c per copy, or the 4 copies for 60c.

RADIO WORLD, 1493 Broadway, New York

Paulists Fathers to Run Station in N. Y. City

TO bring the viewpoint of the Roman Catholic Church on contemporary events before the public, the Paulist Fathers, the information disseminating organization of the church, are going to install a radio broadcasting station at their headquarters at the Church of St. Paul the Apostle, 415 West Fifty-ninth Street, New York City.

The station will be known on its completion as WPL, and will be installed by the Western Electric Company at a cost of approximately \$40,000. It will be a 500-watt station. The erection of similar stations at missions in several other cities is contemplated.

The installation of the broadcasting station, it was explained, will mark the first achievement of a new movement of Catholic missions to teach the truth about the Catholic Church to the people of the United States. It was inaugurated as a part of the celebration of the Jubilee Year declared by the Pope for 1925.

Numerous prominent Catholics already have been selected tentatively to appear on early programs. The Very Rev. Joseph A. MacSorley of the Paulist Fathers is in charge of the project. He took up the work of arranging for the station at the suggestion of Cardinal Hayes, it is understood. It is believed that the Cardinal himself may use the radio to broadcast important messages to the Archdiocese of New York.

The programs as outlined will include concerts by the Paulist Choristers under Father William Finn, lectures by well-known Catholics, both clergymen and laymen, and instructions in the principles of the Catholic Church.

Panel Shielding After Your Set is Finished

A liquid metal; cuts out body capacity, brings in music clear and sweet. Done in 5 minutes. One can shield 5 or more sets; 50c per can. Also a liquid spaghetti can be put on after set is finished, fine for insulating the base board, 50c per can. Post paid.

WALKER MANUFACTURING CO. 247 Scott Street San Francisco, Cal.

NEW REFLEX TUBES

\$2.50

CANADA 35c EXTRA
All Tubes Guaranteed.
Mail Orders Solicited.
Dealers and Jobbers
Write for Discounts.

Denning Radio Mfg.
455 SPRINGFIELD AVE.
NEWARK, N. J.



CONNOR "B" BATTERY

The thriftiest outfit yet

100 volt unit, 2200 M. A. hours, lead plates, beautiful mahogany cabinet, 14x7x7", shipped dry anywhere in U. S. prepaid, \$21.00; high polished cabinet, \$23.00; direct or alternating current chargers for "B" batteries, \$3.75 without attachments, and \$3.25 with attachments. Full set of instructions with battery and charger. Half cash with order, balance C. O. D. 5% discount for cash with order. Get this outfit and stop annoyance of having to buy dry cells every few months and the lugging of battery to service station with its cost.

Connor Battery Company

Van Wyck Boulevard, Richmond Hill, N. Y.

RADIO WORLD HAS A SPECIAL OFFER FOR RADIO SALESMEN. If you want to increase your income substantially, write to Circulation Manager, RADIO WORLD, 1493 Broadway, N. Y. C.

START THE NEW YEAR RIGHT RECORD YOUR RADIO STATIONS

Copyright 1924 by S. T. Aston & Son

Telephone Franklin 2159



\$3.00

Postpaid Complete

100 Cards, Mahogany Finish or Oak Cabinet, and Index Dividers. A Useful Accessory to Any Set. Give Name of Set and Sketch of Dial Arrangement. Postpaid on Receipt of Cash or Money Order. Dealers Write for Terms.

S. T. ASTON & SON 114 WORTH STREET NEW YORK CITY

Radio and Other Technical Books You Need

- Radio Teleg. and Telephone Receivers for Beginners \$0.75
 - Design Data for Radio Transmitters and Receivers—M. B. Sleeper75
 - Wireless in the Home—DeForest10
 - Commercial Type Radio Apparatus—M. B. Sleeper75
 - A B C of Vacuum Tubes—Lewis 1.00
 - Operation of Wireless Telegraph Apparatus25
 - Lessons in Wireless Telegraphy25
 - Radio Hookups—M. B. Sleeper75
 - Construction of New Type Trans-Atlantic Receiving Sets—M. B. Sleeper75
 - 1922 Consolidated Call Book50
 - How to Make a Standard C W Set25
- Any book sent on receipt of price, postpaid. 20% discount on any two books of same title. The whole list of 11 books sent for

\$6.45

THE COLUMBIA PRINT 1493 Broadway New York City
disc always on hand.

RADIO WORLD'S CLASSIFIED DEPARTMENT. If you want to buy, sell or exchange anything, use RADIO WORLD'S Quick-Action Classified Department, 10 cents per word, 10 words minimum, RADIO WORLD, 1493 Broadway, N. Y.

Rules for Success Broadcast

By Joseph P. Day

TEN rules for success were elucidated by Joseph P. Day, the real estate auctioneer, in a speech from WNYC.

EVEREADY Radio Batteries

-they last longer

THOUSANDS OF BARGAINS
FACTORY GUARANTEED MDSE. BY MAIL
Genuine New Radiotron or Cunningham Tubes
UV-199-280-201A-WD-11-12 \$3.33
C299-300-301A-C11-12
Fresh Burgess or Eveready "B" Batteries
22½ Volt large size \$1.68—45 Volt \$5.00 size \$3.38
Write for Free new Complete Catalog on
Sets and Parts
STONE ELECTRIC CO., 714 Pine St., St. Louis, Mo.
All Mdse. F.O.B. St. Louis, Mo. Dept. W

NEUTRODYNE KIT \$19.75
Complete kit of licensed Neutrodyne parts including panel, tube sockets, rheostats, jack, fixed condensers and grid leak. Neutroformers complete with variable condensers and neutrodons. Every part included even to screws and wire. Easy read plans.
Send No Money Order by Postpaid
Pay the Postman
RADIO SURPLUS STORES
HELENA MONTANA

Compendy Radio Receiver
5 TUBE RADIO FREQUENCY
MANUFACTURED BY
E. SINGER CO.
40 HUDSON STREET NEW YORK CITY
Write for Details

Federal Standard RADIO Products
Over 130 standard radio parts, each bearing the Federal iron-clad performance guarantee.
Write for Catalog.
Federal Telephone & Telegraph Co.
Buffalo, N. Y.

RADIO MONEY SAVING CATALOG SENT FREE
TIMES SQUARE AUTO SUPPLY CO., INC.
BROADWAY at 58th St. New York

COAST TO COAST
Every Turn STAR No
A Tap COIL Soldering
SEND FOR LITERATURE
STAR RADIO PRODUCTS CO.
711 S. DEARBORN ST. CHICAGO, ILL.

The Daddy of Them All!
Great DX, Wonderful Volume,
Beautiful Signals!
A very inexpensive circuit, based on the Radola III.
"A DANDY 1-TUBE DX SET"
By Herbert E. Hayden
in Radio World, issue of October 4. Send 15 cents or start your subscription with that number.
RADIO WORLD, 1493 Broadway
New York City

municipal station, New York City. While there was no formula for success, Mr. Day explained, his ten rules of life would help, if followed carefully. They are as follows:

"First—Be honest in all things, in business and in personal matters.

"Second—Work hard, physically and mentally. Make every task, no matter how great or how small, a personal test.

"Third—Live cleanly and avoid illness. Remember that a healthy body is a great asset. Eat wholesome food and build up your strength. Think wholesomely, too, for to the mind wholesome thoughts are what wholesome food is to the body.

"Fourth—Take some recreation. Have a hobby, but do not let your recreation or your hobby interfere with your business, and don't make our recreation lopsided. The brain needs exercise and pleasure just as much as your body does.

"Fifth—Use your imagination. The radio, on which you are now listening in, is the child of imagination. The steam engine, the telephone, the telegraph, the phonograph, in fact the very country in which you live, are all the products of some one's imagination. The man without an imagination can never succeed.

"Sixth—Interest yourself in public affairs and do your part in both civic and charitable work. Charity is a great stimulant to both the heart and the head.

"Seventh—Do not feel that you are overeducated. No matter what your education has been, don't stop studying. There is much knowledge in the world, and even the most learned can, in a lifetime, only scratch the surface. Read good literature.

"Eighth—Never let success turn your head. Success is only relative. There is no human accomplishment that cannot be improved upon.

"Ninth—Never stop smiling. The smile is a great maker of friends in business. Remember that your frown never put wrinkles on the other fellow's forehead.

"Tenth—Never give up. The world is big, but has no place for quitters."

Mr. Day said the great difficulty with ninety-nine out of one hundred people was that they "will not go out of their way to gain success." Instead of waiting for opportunity to knock on the door, he went on, they should "be half way up the block to meet opportunity when he comes along."

It is "pure bunk," according to Mr. Day, to say that the age of opportunity has passed. "There always are and there always will be opportunities," he added.

CROSLEY
RADIO CATALOG FREE
Describes fully the complete line of radio frequency sets, regenerative sets (licensed under Armstrong U. S. Patent No. 1,113,149) and parts
Write for Catalog Today
THE CROSLEY RADIO CORPORATION
POWELL CROSLEY Jr., President
1405 Alfred St. Cincinnati, Ohio


SAVE \$2.25
ON COST OF NEW TUBES BY HAVING YOUR OLD TUBES REBUILT AT \$1.75 EACH.
Guaranteed equal to new. Send us your tubes by parcel post. We return them parcel post, C.O.D., and try to maintain 24-hour service.
HARVARD RADIO LABORATORIES
200 Old Colony Ave.
Boston, Mass.



ONLY THREE TUBES
and it is the equal of any five-tube set ever built. It has selectivity and volume equal to any Super-heterodyne or Neutrodyne.
It has the purity and quality of tone of the crystal set.
It has the simplicity of control of the slugs circuit set.
It has brought in Honolulu, Paris, London and other foreign stations on a loud speaker.
It gets distant stations while a 500-watt station only three blocks away is broadcasting.
It has only two controls and can be logged.
It is not a reflex; it is the result of years of careful scientific research and experiment.
Any novice can build one successfully from our diagrams with complete instructions and special coil.
PRICES
Diagram, instructions and coil. . . . \$5.00
Three-tube instrument ready to use. . . \$8.00
One-tube instrument ready to use;
gets everything on head-phones. . . 18.00
Build or buy one of these wonderfully sensitive instruments and you will want no other.
All goods shipped prepaid.
S. A. TWITCHELL CO.
1930 WESTERN AVE. MINNEAPOLIS, MINN.

The Superdyne Cycle
"RADIO WORLD'S 1925 MODEL DX SUPERDYNE," by Herman Bernard. Only two controls; 4 tubes. One RF detector, 2AF. Wonderful tone quality, great simplicity, fine DX powers and excellent volume. Issues of January 10, 17 and 24. Trouble-shooting described in January 31 issue. Get all four copies. Play safe.
"A 1-TUBE REFLEXED SUPERDYNE," by Herman Bernard. One stage of tuned regenerative RF, crystal detector and one AF stage, great quality of signals. Good for about 150 miles on earphones. Issue of December 6.
"THE 1-TUBE DX SUPERDYNE," by Herman Bernard. One of the best 1-tube DX sets ever published. Fine signal quality. Issue of December 20.
"THE 3-TUBE DX SUPERDYNE," by Herman Bernard, explaining how to add two audio stages, transformer-coupled, to the 1-Tube DX Superdyne. Issue of December 27. Get December 20 issue, too, for full particulars on the detector circuit.
"THE ANDERSON 4-TUBE DX SUPERDYNE," by J. E. Anderson, consulting engineer. One of the most popular and best DX and quality sets using three controls. Issues of November 22 and 29. TROUBLE-SHOOTING in December 6 issue.
Any of the above copies at 15 cents each, or start your subscription with any number. RADIO WORLD, 1493 Broadway, New York City.

NOLTE LOW LOSS COILS
for the
ROBERTS CIRCUIT \$5.50
T. R. F. COILS
SELF BALANCED
F24 (3), \$4.50
JOURNAL ONE
KNOB COIL
F25, \$1.25
JOURNAL
FILTER TUNER
COILS
F23 (2), \$2.50
WAVE TRAP
FILTER COIL
F22, \$1.25
NOLTE MFG. CO.
Dept. C
61 GAUTIER AVE. JERSEY CITY, N. J.



WRM Tries New Carrier Wave, Emitted Only When Modulated

CHAMPAIGN, ILL.

USING for the first time in broadcasting a new method which dispenses with the carrier wave upon which to impress the voice wave, Station WRM of the University of Illinois sent out details of the Illinois-Indiana basketball game. The wave length of the station is 273 meters.

The non-carrier system was perfected

WEAF on 2,000 Watts; First to Use So Much in Test

WASHINGTON.

STATION WEAF, New York City, has increased its power to 2,000 watts on an experimental basis. This is the first station to use 2,000 watts under the test plan. The station is owned and operated by the American Telephone & Telegraph Co.

in the university laboratories by H. A. Brown and C. A. Kesner, and by its use, it is asserted, much transmitter noise is eliminated and the sharpness of tuning by the receiver is increased.

Under the double wave system in use the carrier is audible at all times in the receivers. By the non-carrier system, the University experimenters explain, the carrier wave goes out only when a note is sounded or a syllable spoken, and between notes or words the carrier wave is silent, resulting, it is claimed, in greater distance and purer reception.

on it was found a series of strange characters and seven distinct likenesses of a man.

Dr. Jenkins believes that no other station in the country was sending out pictures at the time and he is at a loss to explain the phenomenon. According to Dr. Jenkins Prof. Cobb took the roll of films to the chief code official at Signal Corps headquarters in Washington, but efforts to decipher the characters on the film were unsuccessful.

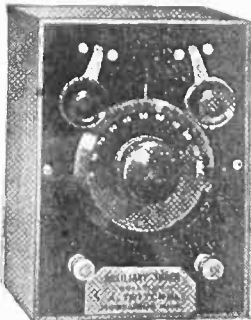
AUXILIARY TUNER

Patents Pending

Better Than a Wave Trap

Improved Model

A TWITCHELL AUXILIARY TUNER



connected to your instrument will positively eliminate all local interference and enable you to bring in distant stations at any time. They are in successful use within 400 feet of large broadcasting stations.

They also enable you to receive on longer wave length than you can get without it.

Copyrighted diagram \$.50
All parts including cabinet 9.00
Complete Tuner, Walnut cabinet 15.00

All Goods Prepaid

S. A. TWITCHELL

1830 Western Avenue MINNEAPOLIS, MINN.

Strange Signals Puzzle Yale Experimenters

NEW HAVEN, Conn.

STRANGE and mysterious signals received by a recently perfected radiograph machine were described to members of the electrical engineering department of Yale University by Dr. C. F. Jenkins, president of Jenkins Laboratories of Washington, D. C. Dr. Jenkins is the inventor of a means of transmitting and receiving pictures by radio and it was in connection with the receiving device of the radio picture set that the signals were discovered.

At the suggestion of Prof. Cobb of the Yerkes Astronomical Department, Dr. Jenkins said, he set up his receiving set in his laboratory a short time ago and left it in a condition to receive pictures for several hours. In Dr. Jenkins' machine the pictures are produced on a roll of films which pass slowly through the set. When the roll of films was developed

\$1.00 Antennaphone

SAFER than a troublesome outdoor aerial BETTER than an unsightly indoor aerial. The telephone is not attached to, but merely placed on the Antennaphone.

Sold with a money back guarantee. Works perfectly with any Receiver.

At Your Dealer Or Sent by Mail Upon Receipt of Only One Dollar

ANTENNAPHONE CO.
90 West St., New York City

The Ideal Aerial

Journal Filter Tuner Kitset

Build this wonderful receiver that has won Gold Medals and the admiration of countless radio enthusiasts. It separates local stations with ease, tunes with the sharpness of a multi-tube set, and filters out undesired signals so satisfactorily that DX stations can be heard while local stations are broadcasting. It has selectivity, distance, and plenty of volume. One or two stages of audio amplification can be added to this set at any time. Complete parts for building this 1-tube set, including cabinet, drilled and engraved panel and wiring diagram for—

\$10.00 complete parts

Approximate Weight (packed) 20 lbs.
(Tube and Batteries extra)

Parts Fully Guaranteed

Shipped anywhere. Money Order must accompany each order—no personal checks accepted. Sufficient postage must be included in order. Send for our Radio Bargain List.

FEDERAL RADIO PRODUCTS CO.
712 BROADWAY SCHEENECTADY, N. Y.



Write Today For Descriptive Folder of the

NEW HOWARD 5-TUBE NEUTRODYNE

This Remarkable Set Has Created a Sensation Among Radio Enthusiasts.

Beautiful Walnut Cabinet with Special Howard Neuroformers, Tube Sockets and Rheostats.

Licensed by Independent Radio Manufacturers, Inc. **NEUTRODYNE** Pat. March 27, 1923 and April 16, 24. Machine Pats. Nos. 1,450,080 and 1,483,228. Other Patents Pending.

HOWARD MFG. COMPANY
42-48 No. Western Ave. Chicago, Ill.

How to Build ULTRADYNE Model L2

12 page illustrated book with detailed instructions on drilling, wiring, assembling and operating Model L-2 Ultradyne Receiver. Latest authentic edition by R. E. Lacault—A. M. I. R. E., inventor of the Ultradyne—the most selective receiver known. Write for descriptive circular.

Phenix Radio Corp.
5-9 Beekman Street New York



The DAVEN RESISTANCE COUPLED AMPLIFIER KIT

The wave of public opinion in favor of Resistance Coupled Amplification is firmly established. The

DAVEN RESISTANCE COUPLED AMPLIFIER KIT

is the most ideal for the Home Set Builder to use. Supplied in 3 or 4 stage Kits without Sockets and Condensers.

Buy of your dealer, the "RESISTOR MANUAL." It's full of information on Resistance Coupling.

Price 25c.

DAVEN RADIO CORP.
"Resistor Specialists"
Newark, New Jersey

Radio Legislation Postponed for at Least a Year

WASHINGTON.

PROBABLY more than a year will elapse before radio legislation is enacted by Congress. This is the belief of Representative Wallace White, Jr., of Maine, author of the White Radio bill. While Mr. White does not agree with Secretary Hoover's theory that radio legislation should be deferred for another year or two, he is willing to be guided by the former's views. Mr. White has not introduced the bill suggested by Mr. Hoover which would enact into law the recommendations of the Third National Radio Conference because he is convinced it would have no chance of passage during the short session.

When Mr. Hoover's recommendation that legislation be deferred for another year or two was announced, Representative White refused to make any statement regarding the matter. Quite a number of people immediately visioned a split between the radio representative in Congress and the Secretary of Commerce. Views were expressed that Mr. White was entirely ignorant of Mr. Hoover's change of attitude and was very much discouraged to have his radio bill thrown down after he had spent the greater portion of the past two years working on it.

It can be said with authority that this version of the affair is entirely wrong. Mr. White and Secretary Hoover have been in close touch with each other all along in regard to the radio situation.

Great Artists Gain by Broadcasting

THE "Christian Science Monitor" in an editorial on John McCormack's broadcasting, says:

"Those artists who have heretofore felt some apprehension regarding the radio-casting of their concerts, lest in some

way they should be the losers thereby, can learn a lesson from the recent experience of John McCormack. This favorite singer had qualms himself, it is said, in this direction, before singing, as he did the other night, to millions of listeners-in. Yet at his concert given at the Carnegie Hall in New York, on the Sunday following his 'appearance' on the air, the house was packed to capacity. Also, it is reported that talking-machine records of his songs have been sold to an unexampled extent since his 'free' concert. The belief that bountiful giving must impoverish is met so frequently that

it cannot be combated too vigorously. A well-known hymn says, 'Ceasing to give, we cease to have, Such is the law of love.' And this law is evidently just as operative in the realm of radiocasting as in any other sphere of human activity."

GGH REPRODUCERS
Black, Shell, Japanese Pearl and Pearl
A wonderful Loud Speaker
Send 4c for Catalog—State If Dealer.
THE BOWER RADIO SHOP
WHOLESALE RADIO
READING, MICHIGAN
Freshman Masterpiece Receivers and Kits

MAHOGANITE and BLACK RADION PANELS
DIALS, KNOBS, TUBING, SOCKETS
RADION LOUD SPEAKER HORNS, ETC.
"THAT SPECIAL SIZE" FOR YOUR PHONOGRAPH, PORTABLE OR SUPER
ALL STOCK SIZES
WHOLESALE RETAIL
Send for Complete Price List
New York Hard Rubber Turning Co.
212 Centre Street New York City

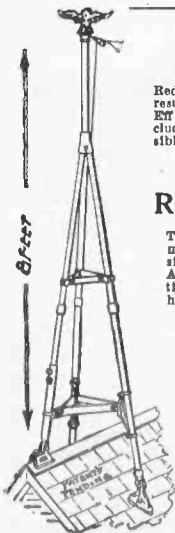
THE HOUSE OF QUALITY AND SERVICE
RADIO Catalogue
LARGEST RADIO STORE IN AMERICA
BUY HERE FOR LESS
509 S. STATE ST. 217 W. MADISON ST.
CHICAGO SALVAGE STOCK STORES

Hook-ups!

All the latest and best "Kits" in our new

RADIO CATALOG

sent to you
FREE



Greater Distance Clearer Reception

Reduced losses, less noise are the results of a good outside aerial. Efficient long distance sets, including ships at sea, use best possible aerial to get results.

EAGLE RADIO TOWERS

Take the place of unsightly home-made masts. Adjustable to fit single or double slope or flat roof. Additional height added by fitting standard pipe to top. Strong, hollow-tube construction.

One Tower FREE

Towers shipped knocked down complete with instructions. Weight 50 lbs. Boy can assemble in an hour. Write for literature, prices and plan whereby you can get one tower free. Money-Back Guarantee.

J. R. Burrell Co.
356 Folsom Place
Dept. 18
Milwaukee, Wis.

NO other Radio Catalog includes such a complete assortment of the best and latest Knock-Down Kits, Parts, and Accessories. You need this book—write for your FREE copy today!

An Unequaled "Kit" Service

All parts for each "KIT" have been carefully selected and tested by our staff of graduate Radio Engineers—satisfactory results are guaranteed.

Completely drilled and engraved panel included with each "KIT." Makes set building easy and sure. No other concern gives this FREE service. Easy to understand Instruction Book and Blue-Prints included with each Outfit. No technical knowledge required to build your radio set.

Save Money On GUARANTEED APPARATUS

Our business is to buy up manufacturers' and government surplus stocks, jobber and dealer bankrupt stocks—but only brand-new, fully guaranteed, nationally advertised apparatus. Our enormous buying power permits us to pay spot cash and set rock-bottom prices—even way below manufacturers' costs. That's why our catalog is crammed with thousands of wonderful Radio Bargains.

Dealers!
Jobbers!
Manufacturers!
ATTENTION!

We will pay you spot cash for your surplus stocks—brand-new apparatus only! Write and tell us what you have.

Remember our motto: **SAVE, SERVICE, SATISFACTION**

Free Mailing Lists
Will help you increase sales
Send for FREE catalog giving
counts and prices on classified names
of your best prospective customers—
National, State, Local—Individuals,
Professions, Business Firms.
99% Guaranteed
by refund of 5¢ each
ROSS-Gould Co. 320 N. 10th St. St. Louis

CHICAGO SALVAGE STOCK STORES
509 S. State St., Dept. R.W.6, Chicago
Write for your FREE copy of our new catalog today—just your name and address on a postcard will do. Please add the names of any of your friends interested in Radio.

Goodyear Back on the Air; Operates WEAR

RUNNING a broadcasting station is no business for a bank, experience proved to Allard Smith, vice-president of the Union Trust Company, Cleveland. The station becomes so popular, he said,

that a bank has to go far afield from its normal duties. That was the reason the Trust Co. sold WJAX, Cleveland, to the Goodyear Tire & Rubber Co. of Akron, O. WJAX becomes WEAR with the transfer of ownership and shares time with WTAM. Mr. Smith said:

"In selling the station we feel that we are stepping out of a field which has developed far beyond the province of a bank.

"We established our station primarily as a means of providing a financial and business service to out-of-town farmers, —merchants, bankers and other business men—men who could use this service in a strictly financial way. In short, our broadcasting bore much the same relationship to the bank as our income tax department, our investment service department or any other strictly service department of the institution. Then came the public demand for evening entertainment programs. Throughout the past two years the Union Trust, with the cooperation of The Cleveland News, has endeavored to fill this demand, although it was considerably outside the usual scope of activity of a financial institution.

"This last year has seen a tremendous development of radio as a commercial business. In fact, it seems highly probable that within a few years, following the example of certain New York stations, a broadcasting station may be in and of itself just as much a commercial institution as a newspaper or a magazine.

"It is not the function of a bank to operate a commercial broadcasting business and we are very glad to step out and turn over that end of radio broadcasting, as far as this station is concerned, to the Goodyear Company. We have retained, however, enough broadcasting time during the day to continue our original financial radio service—that is, the furnishing of market quotations and financial news."

The Goodyear Tire and Rubber Company is planning to extend the broadcasting of WEAR considerably beyond that of WJAX. Every effort will be made to obtain the very finest musical talent for WEAR.

J. M. Thorburn, WJAX engineer, will remain an engineer of WEAR.

Back in the Fold

This is not Goodyear's first venture into the radio field. When Goodyear established its Canadian factory in 1910 at Bowmanville, Canada, the general office was established in Toronto, forty miles away. The need of some swift and convenient form of communication between office and factory soon became apparent and wireless was adopted. So successful was the experiment that plans were under way to link all the important Goodyear branches of the country by wireless.

For Maximum Amplification Without Distortion and Tube Noise
use the well known
Como Duplex Transformers
Push-Pull
Send for Literature
COMO APPARATUS COMPANY
448 Tremont Street Boston, Mass.

Best R. F. 5 Tube Hookup
Uses same panel, same layout, same (but fewer) parts than Neutrodyne. Gives selectivity and pleasing volume from Coast to Coast. Hundreds have changed their Neutros to this. Only extra part, 25 feet real gold sheathed bus wire, lithographed circuit and complete data, prepaid, for \$5.00. Nothing else to buy. Satisfaction guaranteed. Data about circuit—10c. 48 page parts catalog for stamp. We accept stamps same as cash.
KLADAG RADIO LABORATORIES, Kent, Ohio

FAHNESTOCK CLIPS
"Popular Wherever Radio Is Used"
14 Sizes in Beautiful Display Case
Dealers write for big money-making proposition.
FAHNESTOCK ELECTRIC CO.
Long Island City, L. I.

LITTLE WONDER!
SOLDERLESS LUG
Holds Bus Wire Like Clip!
Connect or Disconnect Wires Without Disturbing Terminal
Price 10 for 5c. Ask your dealer.
Distributors Wanted.
Mfd. by **PAUL GLAMZO**
203 Lafayette St. New York

HERCULES Aerial Mast
20 Ft. Mast \$10
40 Ft. Mast \$25
60 Ft. Mast \$45
All steel construction complete with guy wires and masthead pulley. We pay freight.
Write for literature and FREE Blueprint
S. W. HULL & CO., Dept. H31
2048 E. 79th St. Cleveland, O.

This Set Will Set the Nut
Price \$1 Postage Prepaid
NONE IS BETTER RADIO SOCKET SET
The New Britain Machine Co.
197 Chestnut Street New Britain, Conn.

GETS THE STATION MICROTOR
Infinitesimal Control of Condensers and Rotors
1 Division of MICROTOR Knob turns Rotor 1-5400 Revolution.
Controls standard dials to and including 4" diameter. Easy, Universal application.
50c. Postpaid, on receipt of cash.
MANUFACTURERS' & INVENTORS' ELEC. CO.
Distributors write for terms.
29-31 Gold Street Dept. RW New York City

"Can't Lose 'Em"
AMP. GND. SP. +22. +90
Bakelite, Engraved, Nickel-plated with legs
Panels Cut, Drilled, Engraved
Dealers Write for Terms!
CORTLANDT PANEL ENGRAVING CO.
81 Cortlandt Street New York City

PATENT
your ideas. Send us a sketch or sample model of your invention. FREE advice.
Write for FREE BOOKLET
MANUFACTURERS PATENT CO., INC.
70 WALL STREET, NEW YORK

BUY RADIO BY MAIL
SEND 10c TO-DAY FOR
OUR NEW CATALOG
SIMPLEX RADIO SALES CO.
1806 Lafayette Ave. St. Louis, Mo.

BELLTONE RADIO TUBES
TYPE 201-A \$1.75 TYPE 11-12 200
199 With Standard Base Life, Tone and Volume
With Money-Back Guarantee
Mail Orders Promptly Filled
Manhattan Lamp Works
Room 411, 324 West 42nd Street, New York City

Tested and approved by Radio World
"TRI-TUNER"
Build Your Own Set!
Use Arc Rad Products. A Three-Circuit Coil, all Litz wound on natural bakelite.
SENT PREPAID \$3.00
Panel shield and hook-ups included. Fahnestock clips used.
Eliminates Soldering
ARC RAD PRODUCTS
48 South 7th Street Newark, N. J.
EVERY PRODUCT GUARANTEED

Bracket mounting type. Complete, \$4.50.
One Pull on the Jones MULTI-PLUG instantly disconnects antenna, ground, A and B batteries from your set. One push reconnects. And it can't be plugged in wrong! Right foot, cable permits placing batteries out of way—in basement, closet or elsewhere. Makes your set portable. All leads plainly coded.
Jones MULTI-PLUG
THE STANDARD SET CONNECTOR
Used by
Howard-Workrite-Zenith-Mu-Rad
Write for illustrated folder of Panel Mounting and Binding Post types.
HOWARD B. JONES
618 S. Canal St. Chicago

8 Weeks' Trial Subscription, \$1.00

TEAR OFF AND MAIL TODAY

KEEP ABREAST OF THE LATEST RADIO DEVELOPMENTS
RADIO WORLD
1493 BROADWAY NEW YORK CITY

Radio's Religious Influence Is Being Tested

By Thomas Stevenson

WASHINGTON.

WHAT is the spiritual value of radio and how extensively should it be used in spreading religious teachings? This is a question to which the Federal Council of Churches is attempting to find the answer. Many claim that in a spiritual sense radio is a blessing to shut-ins and old folks who are unable to leave home as well as to farmers who live in isolated communities and have few opportunities for attending regular church services. Others assert that many persons ordinarily would attend church remain at home and follow the services by radio under which circumstances the prayers lose most of their value, the family is confirmed in habits of personal indolence and the church and pastor lose the inspiration which comes from their presence in the sanctuary.

Almost at every national meeting held by the Federal Council of Churches the value of radio has been thoroughly discussed. Requests have been sent by this organization to many churches to broadcast their services as often as possible.

At present there are about 50 churches which make a regular feature of broadcasting their services regularly. Whether or not this number will increase depends almost entirely on future experiences.

For the past year the Commission on Evangelism of the Federal Council of Churches has been studying the value of radio for religious purposes.

Fishing Tugs to Have

Radio Safeguard

DUNKIRK, N. Y.

RADIOS and powerful searchlights will make their appearance on the tugs of the fishing fleet next year, according to plans being formulated by fish companies and owners of craft operating out of this harbor. Lake Erie storms, fishermen say, are becoming more severe each year.

When the ice goes out next spring and the fishing tugs again take to the open

water unusual precautions will be taken to guard against boats and crews becoming lost in midlake storms without means to communicate with their fellows, passing liners or the shore.

The 1924 fishing season with gill nets

was one of the best rewarded, but also one of the most hazardous, in recent years. Twenty boats were engaged with gill nets out of Dunkirk and the catch broke all recent records. Most of the fish were sent to New York markets.

WHY NOT SAVE 20%

FROM LIST PRICE ON EVERYTHING?

NO EXCEPTION—ALL STANDARD RADIO MERCHANDISE OF EVERY TYPE AND MANUFACTURE

from complete sets to parts, tubes, and loud speakers, such as:

Atwater-Kent	Eiseman Magneto	Kennedy	Radio Corp.
A. C. Dayton	Federal	Malone-Lemmon	Western Electric
Balkite	Freshman	Magnavox	Workrite
Cumingham	Grebe	Paragon	Zenith, etc.

Mail Orders Promptly Filled; 10% Deposit with Each Order. 25% on orders exceeding \$25.

YOU PAY US ONLY AFTER DEDUCTING 20% OFF LIST PRICE.

ECONOMY RADIO SALES CO., P. O. Box 99, Station O, Dept. 10, New York, N. Y.

INDEPENDENT

NEW TUBES ALL TYPES **\$2.15** EACH

3 FOR SIX DOLLARS
5 FOR NINE DOLLARS


REPAIRED OR EXCHANGED **\$1.75**

5 FOR \$7.50

QUICK DELIVERIES EVERY TUBE CARRIES A MONEY BACK GUARANTEE

RADIO TUBE OUTLET
207 Market St. Newark, N. J.

"Morsing Bus-Bar Union"

Assemble Round or Square Bus Bar and Solder Three Wires at a Time.  Quick Assembly Can Be Made Without Taking Set Apart.

Enough for one set, 25c
No. 1 for 14; No. 2 for 12 wire.
Ten dozen for \$1.00.

Newark Watch Case Material Co.
15 Ward Street Newark, N. J.
DISTRIBUTORS WANTED

Every Radio Fan Needs a

RADIOCLOCK

Turn dial to any hour 6 A. M. to Midnight.

Shows at a glance "Who's on the air", every day, everywhere—all over North America. 700 Broadcasting Stations Indexed with Call Letters, Location, Wave Lengths, Power. Handy DX map included.

50¢ RADIOCLOCK SALES
1106-D Citizens National Bank Bldg. Los Angeles, California

RADIO MAILING LISTS

16870 Radio Dealers	Per M	\$7.50
870 Radio Dealers In Mexico	Per List	10.00
1608 Radio Mfrs.	Per List	15.00
2324 Radio Jobbers	Per List	20.00
1125 Radio Jobbers, rated \$5,000 and up	Per List	15.00
714 Radio Jobbers, rated \$50,000 and up	Per List	10.00
597 Radio Mfrs. making complete sets.	8.00	
128 Radio Battery Mfrs.	2.50	
125 Radio Cabinet Mfrs.	2.50	
60 Crystal Mounters for Wireless apparatus	2.80	
25000 Radio Amateurs	Per M	7.50
325 Phonograph and Music Radio Dealers	5.00	
7400 Radio owners.	Per M	7.50

Guaranteed 98% correct. Ask for Price List and all other lists.

A. F. Williams, Mgr., List Dept.
Established 1880
166 W. Adams St. Chicago, Ill.

NOW \$3.50 C.O.D.

Direct from factory to you

THE RABAT SENIOR
4200 MIL. AMPS. CAPACITY

FOR A LIMITED TIME ONLY

You can purchase for \$3.50 a 12 cell 24 volt RABAT SENIOR battery. Saving \$6.10 through direct buying. The Jobber and Dealer profit now 16 cents. 24 cell 48 volt size \$7.00.

Rabat Senior Batteries

are neat, powerful, noiseless and will harmonize with any Radio Set. Separate cells and patented rubber cork prevent current leakage and clear glass tubes give vision of the condition of battery. Heavy duty plates 2-1/2" x 1" x 5/16" with staggered ribbed grid form the backbone of this sturdy battery. Shipped completely charged ready for instant use. And you can save \$6.10 by ordering now.

RABAT JUNIOR BATTERY \$2.15 c. o. d.
(12 CELLS 24 VOLTS 1200 M. A. CAPACITY)

Incomparable in price and performance. Designed to satisfactorily operate sets equipped with 3 tubes or less. Constructed of the same high grade materials as used in our Senior battery. Shipped dry, uncharged. Order today and save \$1.10.

Rabat batteries can be recharged at home at a very low cost.

Rabat Super-Charger \$3.00 c. o. d.
Is specially designed to satisfactorily recharge any make of storage "B" battery. Shipped complete ready to use, including lamp socket, attachment plug and cord. You save \$1.60 by ordering direct.

SEND NO MONEY

But write us today, advising quantity and type wanted. After examining and approving these wonderful batteries then pay the Expressman the small C.O.D. charges.

The Rabat guarantee is back of all our products. DON'T WAIT. ORDER TODAY and save the middleman's profit.

THE RABAT RABAT COMPANY
1768 St. Clair Avenue Cleveland, Ohio

HOTEL EMPIRE

New York's newest and most beautifully furnished hotel - accommodating 1034 guests

ROOM WITH PRIVATE TOILET \$2.50
ROOM WITH PRIVATE BATH \$3.50
ALL OUTSIDE ROOMS.

Equal distance from Pennsylvania and Grand Central - Walking distance to Times Square and the shops. All transportation lines at our door - Broadway at 63rd St. Within the zone of Columbus Circle (Central Park and 59th St) the most important motor objective in the world.

P. V. Land, Manager



COMPLETE 1924 INDEX OF RADIO WORLD

Appeared in RADIO WORLD dated Oct. 18, 1924, and Jan. 10, 1925. 15c per copy. RADIO WORLD, 1493 Broadway, New York.

"A MECHANICALLY STRONG LOW-LOSS COIL," by Herbert E. Hayden. Illustrated by photographs. Easy coil to make. Send 15 cents for January 17 issue, RADIO WORLD.

"THE INSIDE STORY OF THE TUBE," by Abner J. Gelula. What happens on a tube. What tubes to use for different circuits. Send 15 cents for copy of November 29 issue to RADIO WORLD.



LIFE INSURANCE FOR VACUUM TUBES.

Why Let "Hi-Voltage" take his destructive toll of YOUR Radio Tubes?

Do you know that 91½% of all tubes are destroyed before serving their full normal life?

RADECO SAFETY FUSES will positively prevent vacuum tube blow-out from any cause. Tested and approved by the world's foremost technical authorities, they are the only fuses which slip on the filament prong of the tube, and therefore protect it against all causes of blow-outs. This sure protection costs only 50 cents per tube.

RADECO FUSES fit any standard tube and go in any standard socket. One fuse to a tube is sufficient. Equip all your tubes NOW and foil "Hi-Voltage." If your dealer cannot supply you, order direct. Fuses will be sent postpaid. In ordering state type of tube used.

"RADECO FOR SECURITY"

RADIO EQUIPMENT COMPANY
20 Stuart Street
BOSTON MASS.

New England's Oldest Exclusive Radio House.

