

RADIO WORLD

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How Collins' Heartbeats Were Heard In Earphones

How to Avoid Putting Grid Leak In Wrong Place

VOL. 6. NO. 23.

ILLUSTRATED

EVERY WEEK

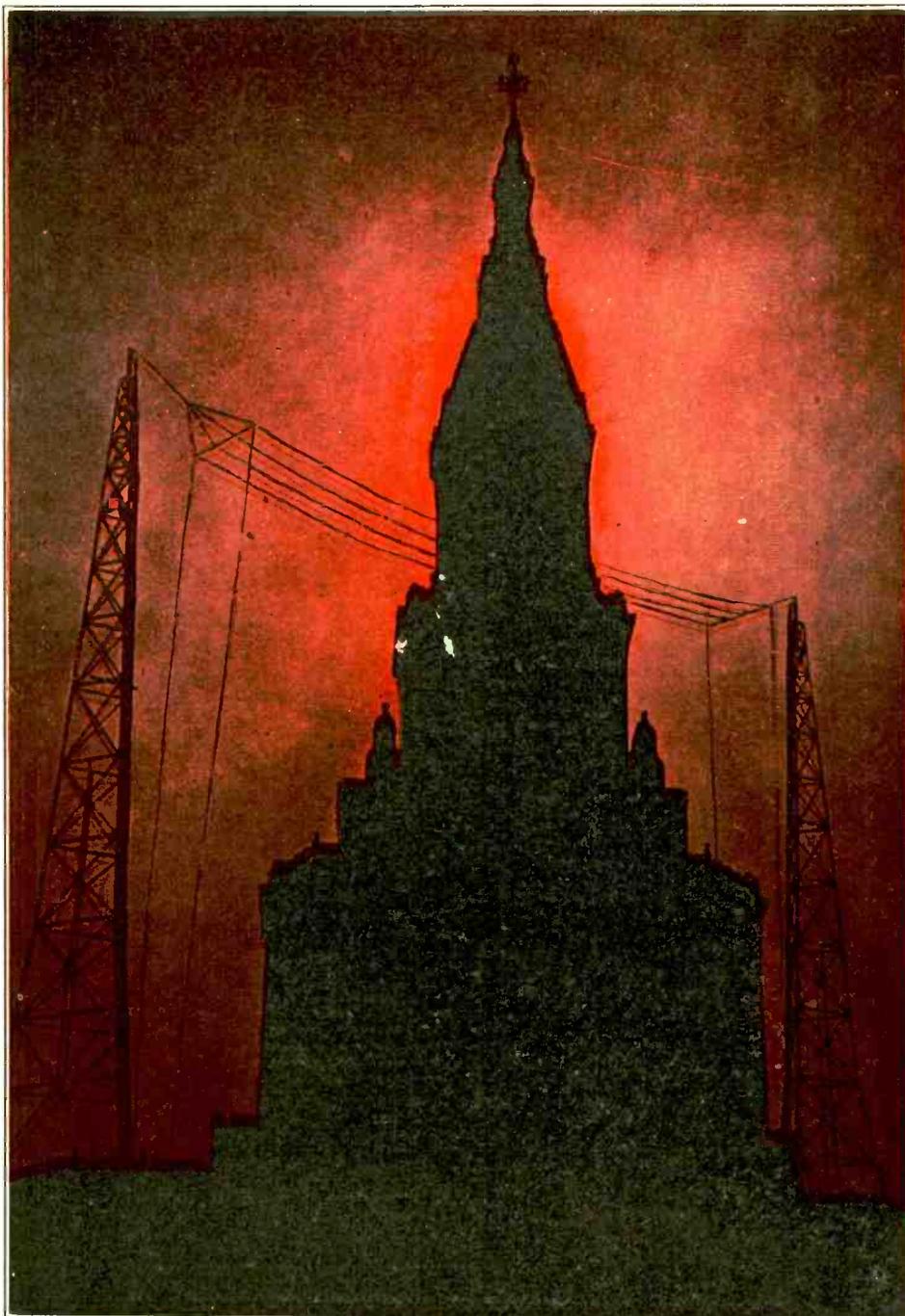
A SUPER-HETERODYNE THAT

Is Reflexed in Three Intermediate Stages; Uses Broadcast Range Intermediate Transformers; Gets DX on a Loop; Uses Only Six Tubes, Where Nine Would Be Needed Otherwise.

See Page 3 for Thos. W. Benson's Article on This Circuit He Devised.

A 3-Tube Inverse Duplexed Neutrodyne

By Lieut. Peter V. O'Rourke



THE ANTENNA of WTIC, broadcasting station of the Travelers Insurance Co., Hartford. The Travelers Tower is in the foreground.

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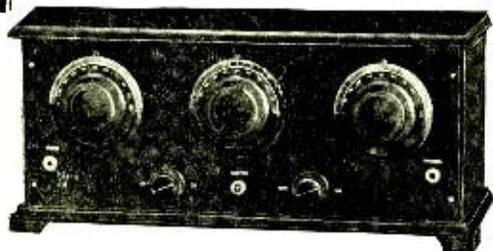
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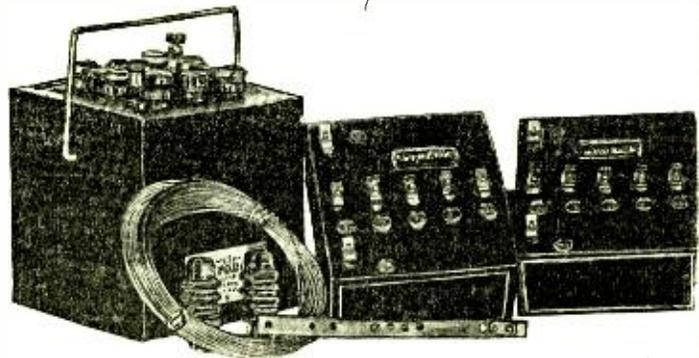
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RADIO WORLD

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A Set That Does the Most Possible with 6 Tubes

Benson Devises a Reflexed Super-Heterodyne of Which He Says: "It Possesses All the Advantages of Both the Reflex and the Super-Heterodyne and When Working Properly Will SURPASS Anything of Its Power Consumption and Number of Tubes"—Broadcast Band Intermediate Transformers Used.

By Thomas W. Benson

IN DESIGNING this circuit the writer determined to evolve one that possessed not only the selectivity of the Super-Heterodyne but offered also the high efficiency per tube of the reflex circuits. The result was arrived at by a rather roundabout method of reasoning but the two circuits are combined efficiently by using known circuits and simply grafting one upon the other.

The first idea was to attempt to reflex the usual heterodyne circuit, using air core transformers for intermediate coupling. The difficulty was that with long-wave intermediate transformers in the neighborhood of 3,000 meters or upwards the radio-frequency transformers had a tendency to pass a portion of the audio-frequency currents by reason of the large number of turns present. The obvious cure was to reduce the intermediate wavelength. Carrying this reasoning far enough it would be clear that a frequency of 500,000 cycles or 600 meters would be an ideal wavelength to carry on the intermediate amplification. At this point it became very apparent that the resulting arrangement would be a standard reflex circuit. And right there was a solution of the problem. The simplest reflex circuit is that used by Squier, Priess, Acme and others and this was decided upon as the intermediate and audio-amplifier.

With such reflex circuits use is made of three radio-frequency transformers that have their greatest amplification at different wavelengths.

For instance, the first radio-frequency transformer may amplify best between 250 and 350 meters, the second between 350 and 450 meters and the third between 450 and 550 meters. This results in practically equal amplification over the entire waveband. However the maximum amplification would be obtained were all the transformers alike as regards point of resonance but it would limit the width of the band of wavelengths that could be efficiently received.

Modulator System Used

To overcome this we have simply to arrange some method of converting all incoming signals to the one wavelength and then by using a reflexed circuit which

Noted Radio Engineer

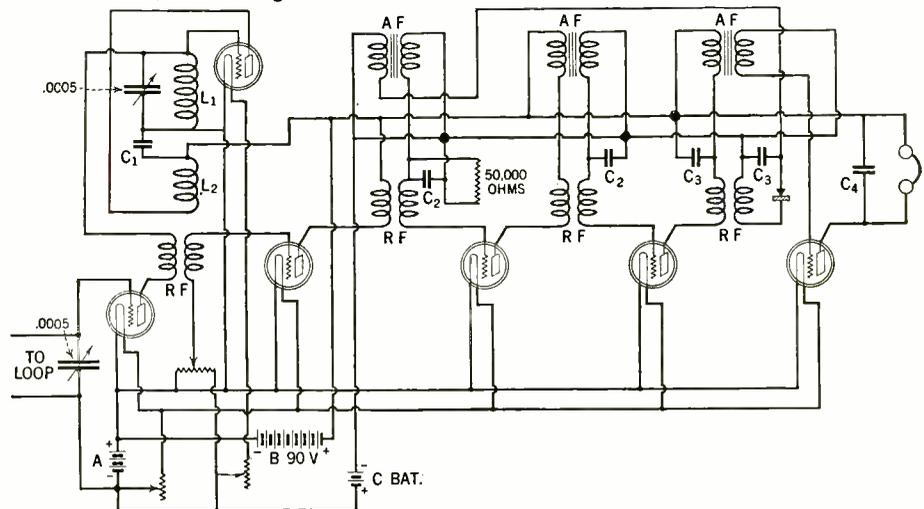


FIG 1, in this 6-tube Super-Heterodyne the modulation system is employed to convert all incoming signals to a short wavelength for amplification at radio frequencies. By using short waves (high frequencies) in the intermediate stages no difficulty is experienced in reflexing. The energy picked up by the loop is delivered to the grid of the first tube, acting to modulate the currents from the oscillator and the beat current at 200 meters is transferred through the radio-frequency transformer to the first intermediate stage. The signal is still further amplified by the two following tubes at radio frequencies and then detected by the crystal detector. The audio-frequency current is then fed back into the second stage of intermediate frequency amplification to be amplified finally three times before it is delivered to the loud speaker. The circuit gives three stages of radio-frequency and three stages of audio. Practically everything picked up will be at speaker volume. A battery switch is optional.

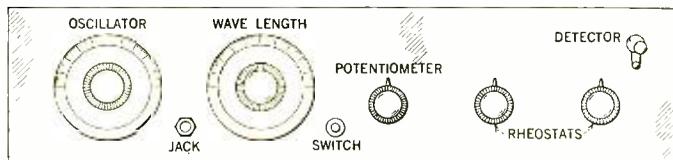


FIG. 2, panel layout for the 6-Tube Reflexed Super-Heterodyne.

works over a narrow band but works very efficiently we would have an ideal receiver. This infers the use of some system of heterodyning or frequency changing to convert the wavelengths. There are several methods of arranging circuits to get the heterodyne action. We have the separate oscillator system as usually employed, the second harmonic as used by Armstrong and the modulation system as used in the Ultradyn. The simplest perhaps is the second harmonic employing only one tube for oscillator

and detector, but I prefer the modulation system because of the amplification obtained by the modulator tube, the oscillator being permitted to work on the first harmonic.

The one remaining question is that of the detector. A tube is usually used for the purpose but where we have extreme amplification as in this case we can sacrifice some of the signal strength obtained by the use of a tube and select instead the clear reception possible with a crystal. We have a further gain in that the radio-

The Model Plan for Assembling

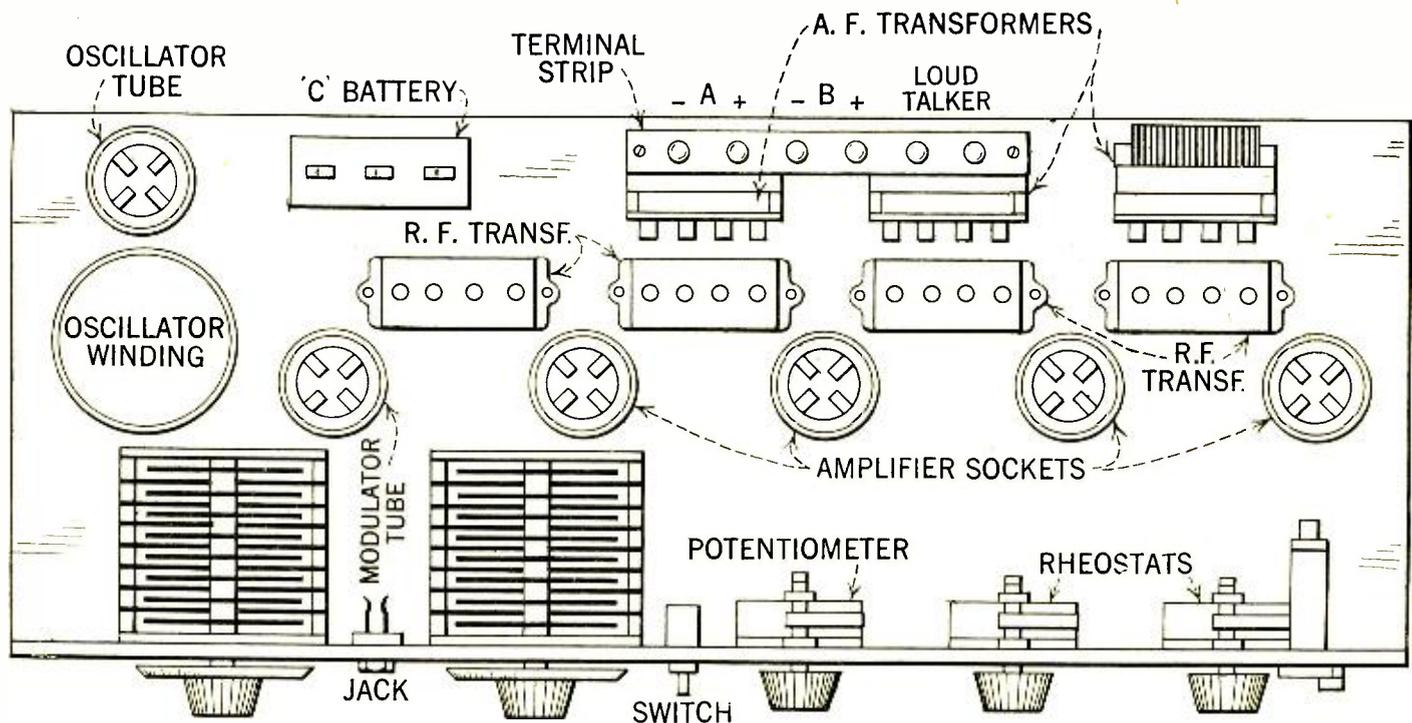


FIG. 3, assembly plan of Benson's Super-Heterodyne, with the parts designated.

frequency currents are well separated from the audio-frequency and the clearer reception really gives longer range by eliminating much of the tube noises.

And thus was evolved the circuit shown in Fig. 1. It will be seen that four radio-frequency transformers (marked RF) are used and since these are all alike maximum amplification will be obtained at all times because all the incoming signals are converted to the wavelength on which they work most efficiently.

LIST OF PARTS

Two .0005 variable condensers, low-loss type (normally 23 plates).

Four Acme radio-frequency transformers, type R3.

Three Acme audio-frequency transformers, type A2.

One 400-ohm potentiometer.

One 6-ohm rheostat.

One 30-ohm rheostat.

One Brownlie crystal detector.

Six moulded bakelite sockets.

One .001 mfd. fixed condenser, C1.

Two .00025 mfd. fixed condensers, C2.

Two .002 mfd. fixed condensers, C3.

One .005 mfd. fixed condensers, C4.

One 50,000-ohm gridleak and mount.

One 7x30x3/16" Bakelite Panel.

One 10x26x1/2" wood baseboard.

Cabinet, batteries, binding posts and 201A tubes.

Winding the Oscillator

In addition to the above the oscillator will have to be wound on a 3" tubing 4" long. Use fibre or hard rubber in preference to bakelite. The grid coil thereof (L1) consists of 30 turns of No. 24 SSC magnet wire while the plate coil (L2) has 15 turns of the same size wire wound in the same direction and spaced 1/4" from the grid coil.

To make the tube oscillate the coils must be connected in the following manner. With both windings wound in the same direction, the end of winding at top of tube goes to the grid, the other end of the grid coil connecting to the negative filament lead. The top end of the plate coil goes to the positive B battery and the bottom end to the plate. Connect the

windings in this manner and the tube will oscillate as soon as it is lighted.

Layout on Baseboard

In laying out the apparatus every effort is made to have the leads between the various instruments as short as possible. Since the circuit is an extended Acme reflex it is advisable to follow the system of layout as shown in the illustration. The additional tubes, oscillator and transformer are located as shown (Fig. 3).

To mount the apparatus a smooth flat board measuring 10x26" is used to prevent undue crowding. It is possible to use a smaller panel but it is not advised on the score of it being difficult to work on and make changes or repairs. Five of the tube sockets are mounted along the board far enough back to clear the condensers that are to be used. Directly behind the sockets the four radio-frequency transformers are mounted, which brings the leads from the transformers almost directly to the socket terminals. The three audio-frequency transformers then are mounted behind the three right-hand radio-frequency transformers. The oscillator coil is mounted at the extreme left, with the oscillator tube socket directly behind it.

Wiring the Set

The wiring of the apparatus can be done before the panel is mounted leaving ends of the bus bar extending to which leads from the panel instruments can be soldered.

The wiring is not difficult if a system is followed in doing it. First of all make all connections to the filament terminals of the tubes, remembering that all the amplifier tubes are on one rheostat and the oscillator on the other. Run the positive leads first and then the leads from the rheostats. Now run the positive B battery leads, making all necessary connections to the transformers and oscillator. The negative lead is then run likewise, making connections to all the transformer terminals as shown in Fig. 1. Now remain only the short jumpers between transformers and between transformers and sockets to be made. The

installation of the fixed condensers and oscillator wiring is left till last.

So far we have not considered terminals. Make up a strip of bakelite with six terminals long enough to mount on the audio-frequency transformers with small brass angles. Connections can be made from these terminals to the proper bus wires at the most convenient point. The positive A, which is also the negative B lead, should be connected to a push-pull switch on the panel, while the negative A runs directly to the rheostats. The C battery is mounted right in the set and no binding posts are required (Fig. 3).

Preparing the Panel

The panel layout is likewise very simple. The two condensers, preferably of the low-loss decrementer type, are mounted at the left end. The switch, rheostats, potentiometer and detector occupy the remainder of the panel (Fig. 2). After mounting the panel instruments the panel can be attached to the baseboard and the wiring completed.

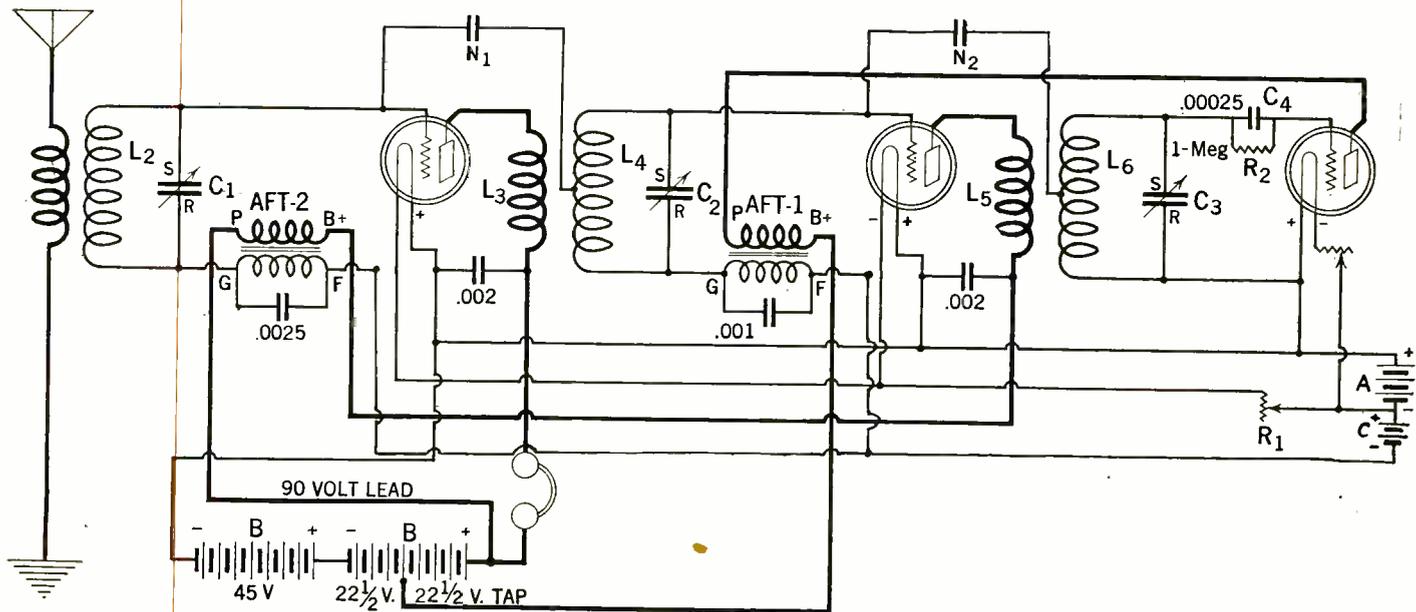
The jack mounted between the condensers is of the single-circuit type and serves to plug in the loop. The type of detector employed is of great importance, for satisfactory service will not be obtained unless the detector is reliable. There are several types of fixed detectors on the market that serve very well for reflex sets but I prefer an adjustable type that holds its adjustment. I used the Brownlie Vernier Detector, designed for panel mounting.

Testing Before It's Too Late

Carefully check over the wiring of the set before attempting to operate it and if everything appears correct insert a tube in one of the amplifier sockets. Connect up the A battery and see if the tube lights. Now remove the positive lead from the A battery and connect it to the positive terminal of the set, meanwhile shorting the A terminals of the set. If the tube lights now there is a short between the A and B leads that must be removed.

[Part II, the conclusion of Thomas W Benson's notable article, will be published next week, issue of March 7.]

A 3-Tube Neutrodyne Set Inversely Reflexed



THE 3-TUBE REFLEXED NEUTRODYNE, comprising two stages of tuned RF, detector and two audio stages. As the detector output is reflexed to the second tube, whose output is reflexed to the first tube (extreme left), the inverse duplex method is employed. This makes the reflexed stages share equally the RF and AF loads. The circuit is not only for the novice to try.

By Lt. Peter V. O'Rourke

REFLEXING the standard Neutrodyne brings the number of tubes down to three, the number required for the average regenerative set. The value of the Neutrodyne lies in its ability to receive distant stations without the aid of the carrier wave. The station comes in immediately upon tuning to the wavelength. There is no difficult adjustment in eliminating the carrier wave, so the station is brought in without any further trouble than tuning to the desired wave.

The circuit (Fig. 1) is the conventional Neutrodyne except for the fact that it is reflexed inversely. The aperiodic primaries L1, L3 and L5 are 8 turns. The secondaries L4, L6 are 50 turns, tapped at the 15th turn. L2 is not tapped. The coils are basket-weave, on a 3" diameter of 15 duvel rods. The aperiodic primaries are wound with part of the secondary coils, near the end (filament connection). The coils may be wound spiderweb, if desired. Use a spiderweb form having 15 spokes and having a core of approximately 1 to 1 1/2" width. The numbers of turns are the same.

In wiring the set, connect the aerial to one end of the aperiodic primary L1, the other end of L1 to the ground. The beginning of L2 goes (a) the stator plates, of the condenser C1, (b) to the grid of the first tube, and (c) to one side of the Neutrodon, N1. The end of L2 connects (a) to the rotor plates of C1 and (b) to G or the secondary of the second AF transformer. F on the same AF transformer goes to the minus C battery. A .0025 mfd. fixed condenser connects across G and F. The plate of the first tube connects to one side of L3, the other side of L3 to one side of the speaker, the other side of the speaker to plus 90-volt B battery. The beginning of L4 goes (a) the stator plates of the condenser C2, (b) to the Neutrodon N2 and (c) to the grid of the second tube. The end of L4 goes to (a) the rotor plates of C2, and (b) to G on the first AF transformer. F goes to the minus C battery. A .001 fixed condenser is placed across the G and F posts of the first AF transformer. The plate of the second tube goes to the beginning of L5, the

end of L5 to the B post of the second AFT. The P post of the second AFT goes to the plus 90-volt lead. The beginning of L6 goes (a) to the stator of C3 and (b) to one side of the grid condenser C4. The other side of C4 goes to the grid of the third or detector tube. A 1-meg. gridleak is placed across the condenser C4. The plate of the third tube goes to the P on the first AFT, the B post to the 22 1/2-volt tap on the B battery. The remaining end of L6 goes to the rotor plates of C3 and to the plus A battery lead. A .002 condenser connects the end of L3 and the plus A battery. Another .002 mfd. condenser connects the end of L5 with the plus A battery. The remaining side of the Neutrodon N1 goes to the tap on L4, the remaining end of N2 to the tap on L6. The plus A and minus B connect together. The plus C and minus A connect together (but not with plus A and minus B). Wire the filaments thus: The minus A connects to one side of both rheostats. The remaining side of the detector rheostat connects to the negative detector filament terminal of the third tube. The

positive terminal goes to the positive A battery. The positive terminals on the two other tubes connect together and thence to the plus A battery. The unconnected side of the remaining rheostat goes to both negative terminals of the remaining two amplifier tubes.

LIST OF PARTS

Three sockets.
Three 201A tubes.
Two neutralizing condensers (Neutro-dons).
Three Neutroformers (LL2, L3L4, L5L6).
Two general radio AF transformers.
Two 6-ohm rheostats.
One 7x21" panel.
One 7x20" base board.
Three 4" dials.
Three dial pointers.
Fixed condensers: one .0025, two .002, one .001, one .00025.
One 1-meg. grid leak.
One single circuit jack.
Batteries, aerial, leadin, etc.

International Fight Begun by Authors' Society

WASHINGTON

ACCORDING to a report to the Department of Commerce, there is to be an international conference at Madrid, Spain, May 16, 17 and 18 to discuss intellectual property in radio transmission. The conference was called by the Junta Directiva De La Sociedad De Autores (Directive Committee of the Society of Authors). All societies of authors, editorial syndicates, editors, transmission companies and radio societies of Europe and America will be invited to send representatives.

The matter is one of great interest to all authors, composers and artists who perform before the mike, as a movement is now on to change the laws of this and other countries so as to protect performances by radio.

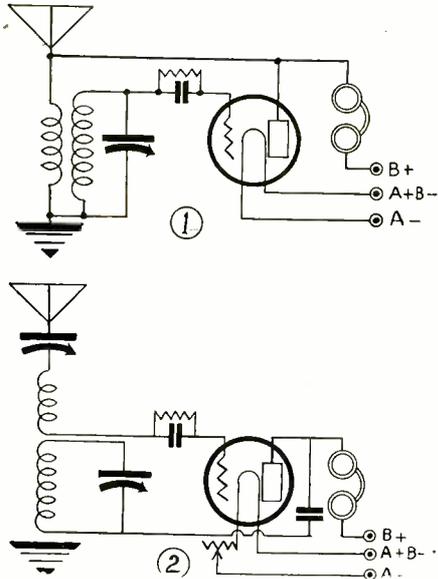
The subject to be discussed at the conference will be international protection of

the rights of authors, composers, to deny such use of their works, or permit it for a consideration, in transmission by radio. The conference, after affirming these rights, will ask all nations adhering to the Convention of Berne, to add to their legislation on intellectual property articles in conformity with the findings of the conference.

The Powers, according to the announcement, will have to require broadcasting stations to pay so much for each program, so much for each song, composition or other item of the program, or a percentage—not less than 10 per cent of gross receipts.

The meeting of the congress, the announcement says, will give the international press an opportunity to debate the legitimacy of using radio for advertising purposes, and to debate rules for receiving as well as transmitting stations.

Make the Tactless Grid Leak Keep Its Proper Place



SOME of the ways a gridleak plays hookey from its proper classroom in the school of radio service.

By Herbert E. Hayden

OF all the parts used in radio sets made by home constructors the grid leak seems to have the greatest amount of wanderlust. Like the restless gentry of the animated world, the grid leak sometimes finds itself in places where it should not be, where it does no good or where it is positively detrimental to the morals of a young circuit. Sometimes, perhaps, the misplaced grid leak is not the fault of the home constructor at all, for he has



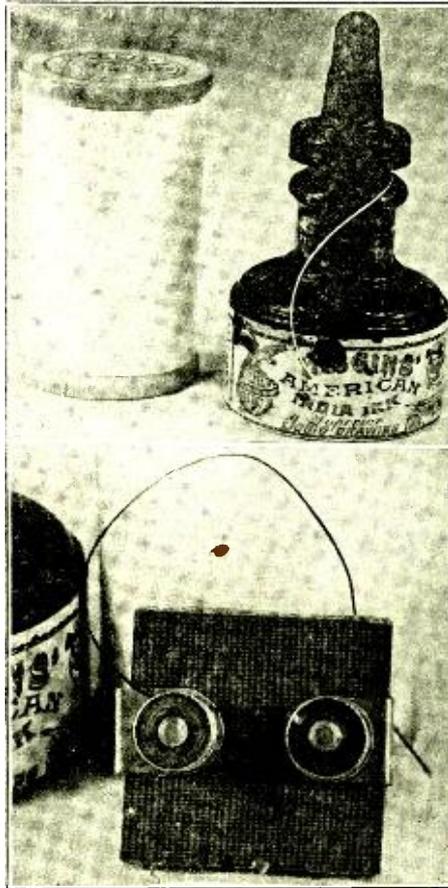
HERBERT E. HAYDEN

simply followed a wiring diagram he has seen somewhere.

Where to Put the Leak

It is safe to follow the rule that the grid leak, when used in conjunction with a detector circuit employing the grid condenser method, at any and all times may be connected from the grid post of the detector socket to the A battery plus. The function of the grid leak is to permit excessive negative charges of electricity to leak slowly off the grid of the tube and about as good a place for them to go is to the positive A. The leakage is slow in respect to the oscillatory current in the tube, but fast as compared to the audio currents. Hence a variable leak often comes in handy, not that it should be tampered with every time one tunes in a different station, but that the best setting be determined and then left that way for weeks or months. As the tube changes internally, due to ageing, perhaps a different setting will prove better later on.

The leak has found itself in some fancy places even in print. One manufacturer was instrumental in the publication of a circuit showing the grid "leaking" to the plate, I do hope the set was not supposed to be made that way. It is true enough that a leak in the wrong place will not usually prevent a set from functioning, but it certainly will cut heavily into the ef-



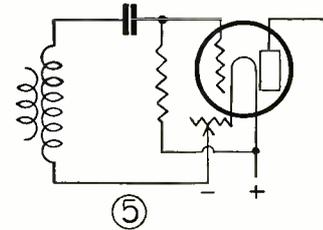
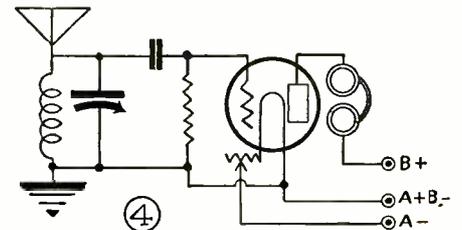
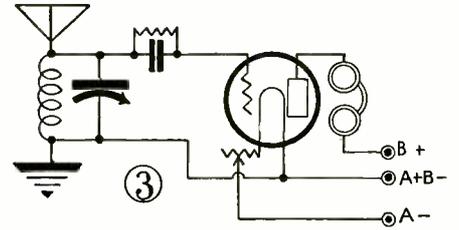
A GRIDLEAK may be made very easily of India ink and linen thread. Depending on how much ink you put on your resistance the leak will vary. But it's whatever resistance it is. This is not a variable leak. Some of the thread, with ink on it, is looped around one side of the grid condenser, the other side of the condenser being attached connected to the remaining end of the leak. As any fan will see at a glance, the leak may be made variable, so to speak, by leaving quite a piece of string and including so much as is found best between the two condenser posts. Once the best value is found the string is left there—until you can buy a manufactured leak. Atmosphere affects this home-made type rather markedly.

fectiveness of operation. Some fans wonder why their set, which by common agreement is of the kind that usually gets DX, doesn't show any signs of willingness in respect to themselves. Quite often an inspection will show the grid leak running into the aerial, a fearsome place for it to go, or to the plate.

Too Convenient Mounting

Usually a grid leak is mounted on a grid condenser, because the condenser has clips thereon for that purpose. As the grid return is to the positive everything is all right. Even if the grid return is to the negative, as with some tubes, it isn't bad practice to let the leakage be to the negative. The important thing is to have it leak to the A battery, although the plus A is preferable perhaps.

However, if the leak is to be connected from the grid post of the detector tube socket to the A plus, as the rheostats usually are in the negative lead, this connection may be made right to the F plus post of the socket, for filament plus and battery plus are identical. In any case of a grid return I always take care that the return is made to the battery, not to the filament (socket post), unless they are identical. In



CORRECT ways of including the gridleak in a detector circuit.

that way the grid return is not obstructed by the resistance of the rheostat.

The fact that a variable condenser tunes a coil does not constitute the condenser the voltage source, hence it is folly to make the leakage to one side of such condenser, caring nothing about what part of the tube the condenser connection goes to. In the Ultra-Audion circuit, where the grid return is to the plate, it is quite an ordinary mistake to leave the grid leak mounted on the convenient grid condenser clips. This puts the leak between the grid and the plate. As a matter of fact, no leakage occurs there. Paralysis is more to be expected. Even as there are stray magnetic and capacitive couplings in sets there are stray paths of leakage. Some tubes, particularly those of the "soft" type, like UV200 and C300, may function without a leak, because leakage takes place within the tube itself. This may be true, also, of the 5-volt Sodian tube.

Follow the Motto

But, with these exceptions, it is hardly safe to ignore the purposes and placement of the leak and rely on the overworked tube to help you out. Stick to the formula, "Grid post of detector tube to positive A" and you will not go wrong. This applies to detector tubes. Sometimes a leak serves a different purpose in a different part of the circuit, but fans don't seem to go wrong much in those cases.

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Three Resistance Stages of AF on the 3-Circuit Tuner

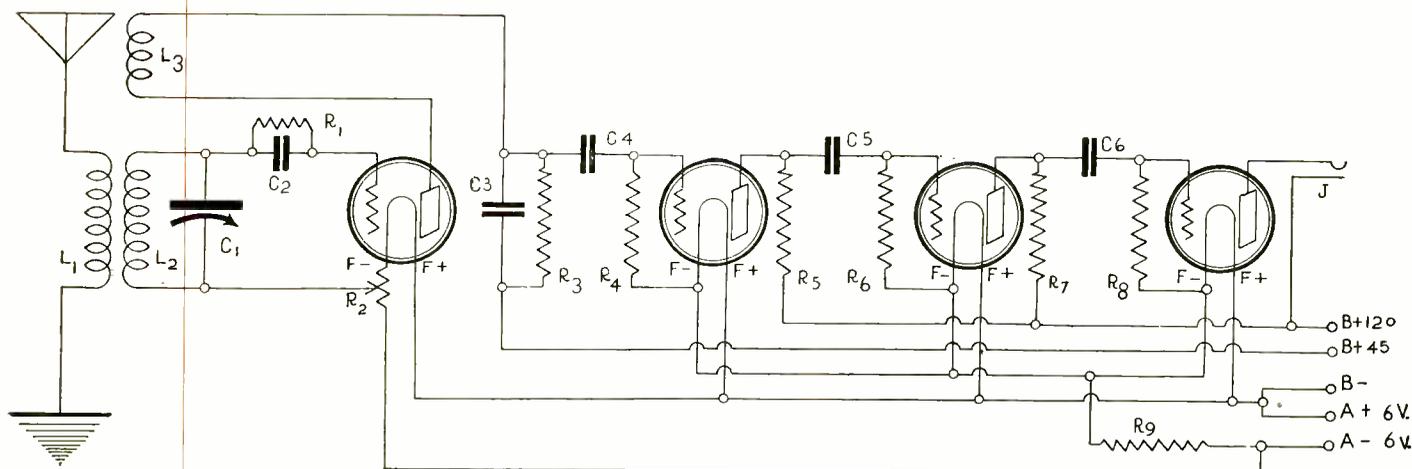


FIG. 1, wiring of the DX detector circuit, with three stages of resistance-coupled audio-frequency amplification. The coupling resistors, R3, R5, R7, are 100,000 ohms. R4, R6 and R8 are gridleaks having respective values of 1,000,000, 500,000 and 250,000 ohms. C3 is .002 mfd., C4, C5, C6 are .006 mfd. The author used the ready-made unit.

Excellent Tone Quality Obtained Even on Remote DX Stations

By Albert Edwin Sonn

Radio Engineer

IN an effort to improve on the 3-circuit tuner with its usual two stages of transformer-coupled amplification, I set out to design a receiving set which would give as near to perfect reproduction of voice and music as possible.

Having in mind the standard form of resistance-coupled amplification, which is recognized as the most successful system of amplifying for quality reproduction, the standard 3-circuit set was put together so as to include this form of amplification. The resistance-coupled amplifier is even simpler to install and operate.

The circuit constructed was put to several tests, not only by the builder himself, but a number of others who tried it for their own satisfaction. Every one gave a very favorable report on its remarkable operation.

Selection of Parts

Select a good variable condenser (C in Fig. 1) of .0005 mfd. capacity, normally 23 plates. This condenser tunes the secondary coil of the variocoupler. With a good condenser and a poor coupler we do not gain, so choose a good condenser to match a low-loss coupler. Any good coil and condenser combination will prove very satisfactory. I used a Radio Engineering Laboratory coil and Cardwell condenser. The coil has an adjustable primary, which is very helpful. This consists of about 8 turns of No. 16 DCC wire wound on a 3" tubing. The secondary is wound in basket weave style and contains about 45 turns of wire. The plate coil contains 18 turns of No. 18 wire wound on a tubing similar to the primary. The secondary is about 3/4" in diameter. The three coils are on a special aluminum stand for panel mounting.

The antenna and ground are connected to the two terminals of the aerial coil. The secondary is connected across the .0005 variable condenser and these two leads go also to the grid and positive filament connections. The tickler winding is in the plate circuit, one side going to the plate terminal of the detector tube

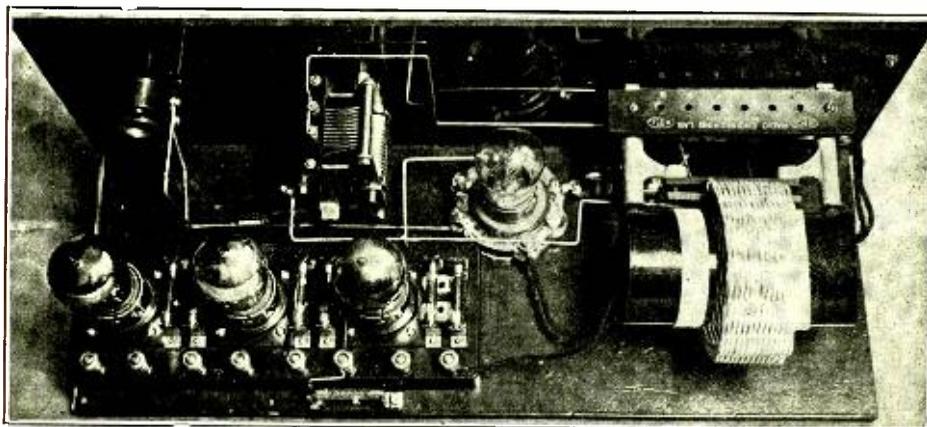


FIG. 2, the completed circuit. The tuning coil is at left and has two variable factors, the adjustable primary and the tickler coil. The large winding is the fixed secondary, tuned by the variable condenser at right. The detector tube is at left. At right is the 3-stage resistance-coupled amplifier.

and the other to the input posts of the resistance coupled amplifier circuit. The input circuit also connects to the positive B battery at about 45 volts. The input is also shunted with a .002 micadon fixed condenser (C2). This latter condenser is important, as the set will not work without it.

Amplifier Unit Employed

Having been through the mill with various forms of resistance-coupled amplifiers using either variable or fixed resistances, experience taught me to be extremely careful in the selection of a unit to go with this regenerative receiver. Accuracy of leak resistances and permanency are very important. Fixed condensers of the right value also play an important part in this circuit. Leaks which change in resistance value every time the weather changes are to be avoided. It is difficult for the set builder to tell if he has an inaccurate resistance in the circuit. He must take the maker's word for the resistance value, although it may have changed several points in a week's time.

A very compact 3-tube resistance coupled amplifier manufactured and guaranteed by the Daven Radio Corporation was selected finally for this set. This unit was just the right size to fit on the baseboard and as it had all of the resistance units and condensers already in circuit the chance of going wrong in its use was hardly possible. The sockets and mounts

for the leaks and condensers were all mounted in a block of bakelite with binding posts arranged on the side for all connections. This saved a good deal of space that otherwise would be occupied by sockets, mountings and condensers.

The input terminals were also located in a convenient place so that the detector tube circuit could be coupled up with very short leads. As can be seen from Fig 1 one of the input wire connects to the detector B battery while the other connects to the plate wire from the tickler coil. The bakelite base contains all the necessary connections for A and B battery.

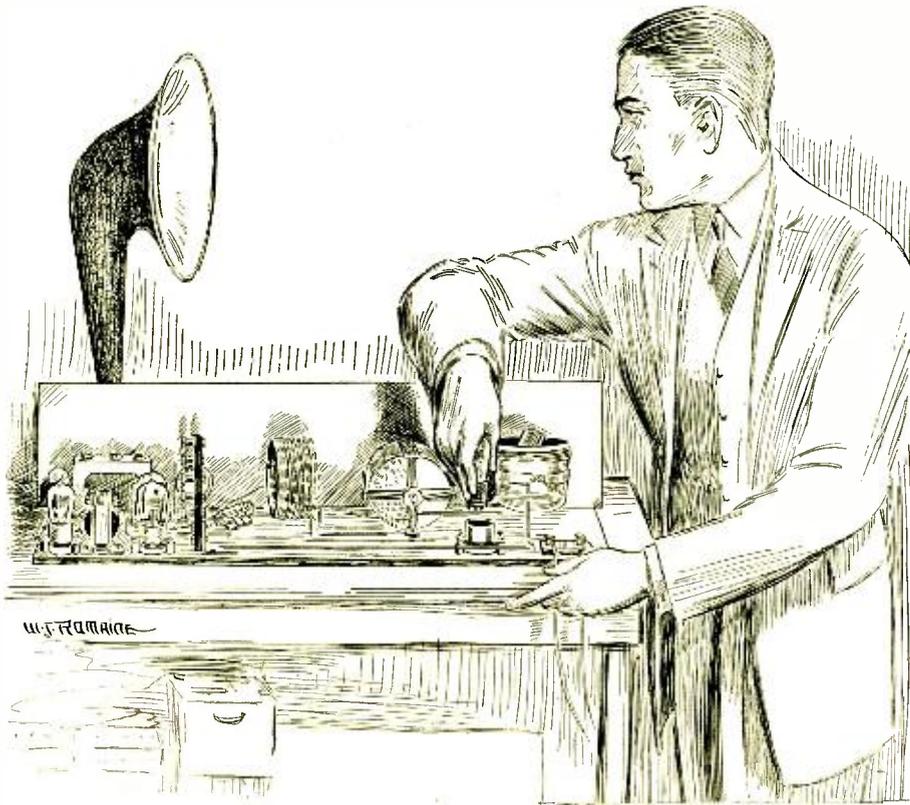
A small fixed resistance was connected in the negative A lead to serve as a "fixed rheostat" for the amplifier tubes. This did away with an extra resistance on the panel (rheostat). The amplifier tubes do not require a critical adjustment and a fixed resistance will do at this point. A 10-ohm rheostat was provided on the panel to control the filament of the detector tube.

The very convenient form in which the resistance coupled amplifier is furnished makes it unnecessary to wire up this part of the circuit, as this is done by the manufacturer.

Ninety volts of B battery will work this amplifier, although 135 volts or three 45-volt B battery blocks are required for better volume. It is suggested that 90 volts be tried out first and if the volume

(Concluded on page 21)

The Goal of Golden Silence



How to Tell When You Have Achieved the Neutralizing Effect in the Superdyne

By Herman Bernard

A QUESTION that often puzzles the constructor of a Superdyne, such as RADIO WORLD'S 1925 Model, described in the issues of January 10, 17 and 24, is: **How can I tell whether my Superdyne is Superdynaming?**



Herman Bernard

The question is all the more puzzling since the set will work whether the tickler feedback is in positive or negative direction. If it is positive the circuit is simply a combination of radio-frequency amplification and regeneration. The tickler is the regeneration control in either case. However, the mere fact that the set works well either way is no denial of the fact that it works much better one way than the other. The better way is of course the Superdyne way. That is why the Superdyne is super-fine.

The Superdyne Neutralizes

It is perhaps surprising to some to hear that the Superdyne principle embodies neutralization. The comparison may be made with the familiar neutralizing or balancing condenser as used in the Neutrodyne. The current flows in the neutralizing circuit of the Neutrodyne in a direction opposite to that in which the oscillating current is flowing. In the Superdyne this is likewise true. At that point the two circuits have a bond in common. But the Neutrodyne is neutralized for a given wavelength, or each RF tube for a given wavelength, while the Superdyne is neutralized each time that

a station is tuned in. This is done by actuating the dial of the tickler coil. If the feedback is exactly right for the wavelength, then neutralization is perfected, provided the Superdyne principle is being used.

When neutralizing a Neutrodyne one removes the first RF tube from its socket, places a piece of paper on one of the filament prongs or one of the filament springs of the socket, then reinserts the tube. Although the tube will not light, nevertheless the self-capacity of the tube, plus the even more important stray couplings by induction and capacity, still transfer the signal on to the second RF stage. At this point the signal is fainter. The trick is to make it inaudible, if possible. At least the neutralizing condenser is adjusted until the signal is as faint as possible. Absolute silence is not often achieved in home-constructed Neutrodynes.

In the Superdyne the twin of this test is in the removal of the radio-frequency tube. If the Superdyne principle is not being employed, even with the RF tube socket empty, signals will be heard, locals about as well as formerly. Then you will know that the neutralizing condition effected by the Superdyne is a missing quantity.

With the RF tube out of the circuit, or in it and unlighted, there should be utter silence.

Unless this condition exists there is a danger that oscillations will occur in the circuit to such an extent that no signals will be heard. This is not a chronic condition, but will arise from time to time if Superdynaming isn't being achieved. It is due to the RF tube oscillating at radio-frequencies, which are inaudible. Another form of oscillation results in heterodyning, setting up an audible beat-note, and this spoils reception, while not completely preventing it.

How to Superdyne the Set

The achievement of the Superdyne result—perfection of tonal quality combined with absolute control of the set and the reception of loud, clear signals from great distances, on the speaker—is not difficult;

the plate of the radio-frequency tube is connected to one side of the primary of the radio-frequency transformer, while the other side of the primary goes to one terminal of the tickler, whose other terminal goes to B plus amplifier voltage. If these connections are properly made, and the coupler and RFT are kept out of inductive relationship with each other and out of the electro-static field of the variable condenser, the solution is assured. The method of procedure is as follows:

Hold the radio-frequency transformer on top of the coupler. See that the windings of both are in the same direction. This is determined by having corresponding terminals point in the same direction. As the couplers and RFT for this circuit are all wound in the same direction, no confusion should result. Consider a coupler where no winding is atop another. If the terminals of the RFT point in a direction opposite to those of the coupler, then turn the RFT upside down. That terminal of the coupler primary which is on top (or, if the coupler is mounted upside down, that terminal on bottom) is the beginning of the aperiodic primary. It is always the primary terminal nearest one end of the tubing. The end of the primary is the other terminal. The beginning of the

(Concluded on next page)

"Clearest Thing I Ever Heard," His Verdict

SUPERDYNE EDITOR:

HAVE just completed RADIO WORLD'S 4-Tube 1925 Superdyne, using Globe coils. In one hour's time I tuned in the following stations—KSD (at 95 on dial), WHO, WOAW, WOS, WFAA, WBAP, WJAD, WMC, KOA, WDAF, KFKX, KTHS, WLW, WCB D. I wish to express my appreciation to Herman Bernard, the designer of this set, as it is the clearest thing I've ever heard in radio. The reception on all of the stations was as nearly perfect as I believe possible.

I believe that the RF transformer that the Globe concern is putting out with their broadcast coupler is as well matched as it is possible. The condenser worked perfectly—without changing a single tap on secondary the RFT.

C. L. BROWNING,
Mgr., Texas Power & Light Co.,
Cleburne, Texas.

* * *

Gives Three Cheers for 1925 Superdyne

SUPERDYNE EDITOR:

IHAVE built the 1925 Model Superdyne as described by Herman Bernard, issues of Jan. 10, 17 and 24, and tried it three nights. I logged 34 stations so far: WCAP, WBAP, WLS, WGR, WTAS, KOA, WGN, WCB D, KTHS, WLW, WSAI, KDKA, WKAR, WDAF, WSAY, WTAM, WJJD, WHB, WBZ, WCAE, KFRU, WFAA, WEAO, CFCA, WOC, WHO, WHK, WMN, WCCO, CNRO, WOJ, WMBF, KFIU, WHAZ, all on the speaker. Three cheers for Bernard's 1925 Model Superdyne!

VELL KING SMITH,
1749 Chase Ave., Cincinnati, Ohio.

EVERYBODY who builds RADIO WORLD'S 1925 model 4-tube DX Superdyne is invited to write to Superdyne Editor, RADIO WORLD, 1493 Broadway, New York City, telling what results be got. Every Superdyne results letter received will be published.

How a Tickler Neutralizes

secondary corresponds to the beginning of the primary, that is, it is the terminal nearer the same end of the tubing as was the primary beginning. The tickler beginning is that terminal which corresponds to the other beginnings, when the windings of the tickler are in the same direction as those of the primary and of the secondary. This may be determined in the same manner by noting the way the terminals point. The windings should be observed on one side of the coil. If a winding begins and ends at opposite sides of a form, theoretically carry out winding, so that both terminals will appear on the same side. Thus you will visualize one theoretical arrow pointing one way, the other arrow the other way. Any two terminals of any winding must necessarily point in opposite directions when the terminals are on any given half of the tubing circumference. Suppose there is just one complete turn. If you solder the ends together there is neither beginning nor end, but if they are severed, one terminal points one way, the other the opposite way.

Therefore, with the beginning of the RFT established, and this is an important consideration, the plate of the RF tube is connected to the BEGINNING of the RFT primary, the end of that primary to the END of the tickler, and the beginning of the tickler to the B battery high voltage. That done, your only remaining source of trouble in this regard would be the stray magnetic and electro-static couplings.

The neutralization in the Superdyne is an effective check upon oscillations. It does not prevent radiation, however. Only by careful tuning, so that the regeneration does not spill over, is radiation prevented. This differs slightly from the run of regenerative sets in that what radiation does occur due to unskilled tuning is less. If the detector tube is fed with the correct amount of A battery current, the plate voltage is not higher than absolutely necessary. On any tube, the condenser dial may be moved from 0 to 100 without occasioning any squeal whatever, only a rushing noise in the speaker being heard except at that point which coincides with the correct tickler dial setting for that wavelength. This is the goal. Keep at your task until you succeed.

Roxy's Austerity Brings Protests From Fans

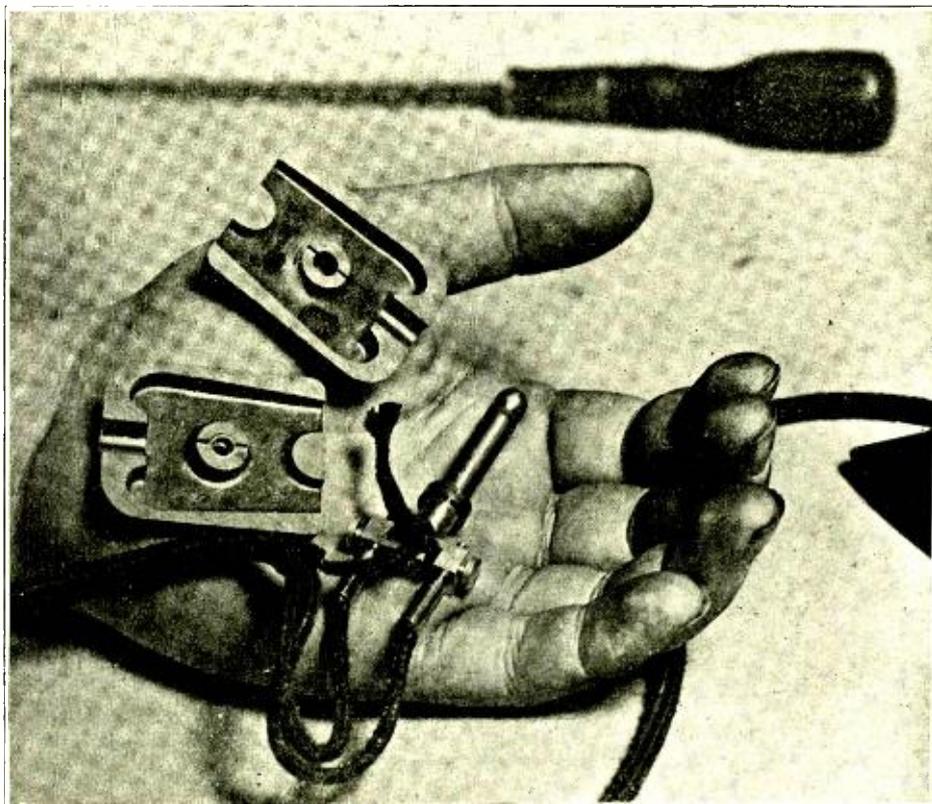
FROM the thousands of letters of protests directed to the WEAf broadcasting station, New York City, objecting to the new and dignified broadcasting of "Roxy"—S. L. Rothafel, manager of the Capitol Theatre, and announcer at the Sunday night programs—it would appear that they endured all they could.

"Roxy," true to orders given him by officials of the station, stopped his breezy bantering chatter and "strictly tended to business" in announcing a program.

"His talk was as solemn as a sermon," said the protesters.

And in defense of all this objection to "too much dignity in 'Roxy,'" J. A. Holman, broadcasting manager, said that while "we have always wanted Roxy to be more dignified, we do not want him stiff and unnatural, just a little less breezy."

Inside Facts On Plugs and Jacks



A PHONE PLUG taken apart to show jack connections.

NOISY reception is not always static or bad B batteries. Many times poor reception may be traced to the phone plug, jack or tips. Take your plug apart and examine carefully the phone tips for loose connections. In the jack you will notice that there are two leaves, one which makes contact with the knob on the plug and one which makes contact with the sleeve. You will notice that one of the phone cords is colored, the other black. The colored tip should go to the plate of the tube. Ascertain on the plug whether it is the knob or the sleeve that makes contact with the jack leaf connecting with the plate and connect the colored cord accordingly. After you have determined which is which, tie the small piece of string on the phone cord to the ring on the jack. This will prevent your pulling the cord ends out of the tips, for the string will take up the strain.

This Nameplate Free



The manufacturers have promised to deliver these nameplates to RADIO WORLD "very soon," and no time will be lost in sending them to applicants. Send in a request for a nameplate for the panel when you build RADIO WORLD'S 1925 Model 4-Tube DX Superdyne. Send in your order now. These nameplates are in white, gold and black. 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.

Frank J. Goldsmith, 6190 Vermont Ave., Detroit, Mich. (4)

Joe Heard, Jr., 645 Lucilla Drive, Baton Rouge, La.

John Listiacke, Jr., 71 N. Richview Ave., Youngstown, O.

Joe Regelman, 914 Adelina Pl., North Bergen, N. J.

Joseph Cirillo, 439 W. 25th St., New York City. (2)

F. W. Johnson, 217 Lynch Bldg., Tulsa, Okla.

Lee E. Bristler, R-1, Box 9, Girard, Ill.

Freman McCory, East Tawas, Mich.

Geo. W. Stanton, Vermillion, Kan.

Frank J. Eslinger, R-1, Box 78, Oskosh, Wis.

H. A. Wakely, 784½ 12th St., Milwaukee, Wis.

B. H. Corbin, 964 Ashbury St., San Francisco, Cal.

R. W. Smith, 1361 North St., Springfield, Mass.

W. L. Rumbaugh, Winifrede, W. Va.

Sidney Start, 2710 Taylor St., N. E., Minneapolis, Minn.

H. R. Wallin, P. O. Box 90, Galveston, Tex.

Tom A. Carr, Box 227, Newport News, Va.

Walter Hoffman, 456 New St., Freemansburg, Pa.

Chas. S. Cooper, 54 Millet St., Dorchester, Mass.

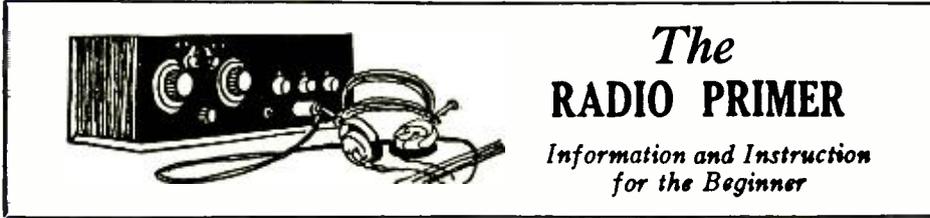
Richard Nicholson, 2709 Mt. Elliott Ave., Detroit, Mich.

Jerry Swoboda, Abie, Neb.

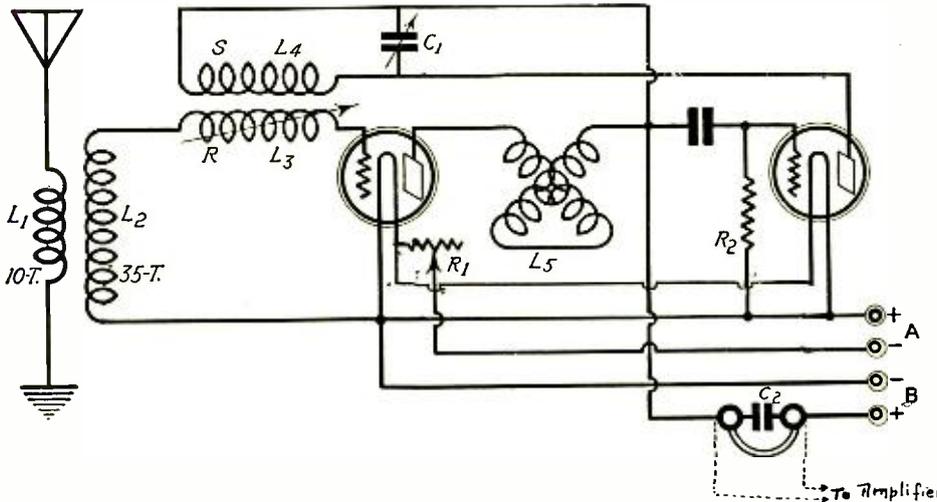
E. M. Cummings, Olathe, Kan.

N. L. Eberhardt, 8106 St. Clair St., Cleveland, O.

Aerial Rules You Should Obey



Match Tubes to Purposes They Are to Serve—Audio or Radio-frequency Amplification for You?—Expert Advice on Dry Cells and Batteries—Other Tips for the Novice.



RADIO-FREQUENCY amplification is added to a circuit mainly to reach out into the far distances. Here the tube at left is the RF amplifier. Regeneration is used in the detector tube (at right) by coupling its output with the grid of the RF tube, a novel method. L1 L2 is wound on a 3/2" diameter tubing. L3 L4 is a variometer, its stator (S) severed from the rotor (R) by cutting the one connecting wire. The variometer L5 regenerates the RF tube, the coupling of plate and grid taking place capacitively, inside the tube. The fixed condenser coupling the RF plate to the detector grid is the usual .00025 mfd. grid condenser. A2 is a variable leak. C1 is a .0005 mfd. condenser, normally 23 plates. Read Abner J. Gelula's article for a discussion of which tubes are best.

proved reception. Losses are reduced, giving greater distance and volume.

For results in multitude sets different type tubes should be used according to the value of the tube in the circuit. When determining the type tube to be used, the uppermost consideration in the minds of most radio men is what current the filament draws. If the best results are to be obtained current draw will be a secondary consideration.

In the Super-Heterodyne I have found the best oscillator tubes to be, in this order, UV201A, DV3, UV200, UV199. For the radio-frequency amplifiers, Meyers, UV199, 201A, DV3. For detection, UV200, UV199, DV2, Meyers. For audio-frequency amplification: UV201A, DV3, UV199, Meyers.

Amplification

Radio-frequency amplifies the incoming signal before rectification, i.e., before it passes through the detector circuit, while audio-frequency amplification amplifies after detection.

Now, the question arises: "How do I know what type of amplification will be best suited for my purpose?" If you care more for volume than distance, use audio-frequency amplification. Should you care to "roam about the country" radio-frequency amplification.

Theoretically, audio-frequency amplification will increase only the volume of a signal which has already passed the detector tube. However, practically AF amplification will increase the range of a receiver. If a signal has successfully passed the detector and is too weak to actuate the phones, the audio amplifier will boost the strength so that you may hear the signal.

Radio-frequency will also increase volume, but not much.

The Batteries

In every multitube set (three or more)

By Abner J. Gelula

TO be a successful experimenter one must know the fundamental principles of radio transmission and reception. It is not sufficient to know merely that the radio impulses travel upon waves that circle in all directions simultaneously. It is not sufficient to know the proper use of the soldering iron in radio work. It is not sufficient to know that when the plate of a tube is tuned it becomes regenerative. To experiment in a haphazard manner produces little results. You must have a goal, a theory you are working to prove to your satisfaction.



ABNER J. GELULA

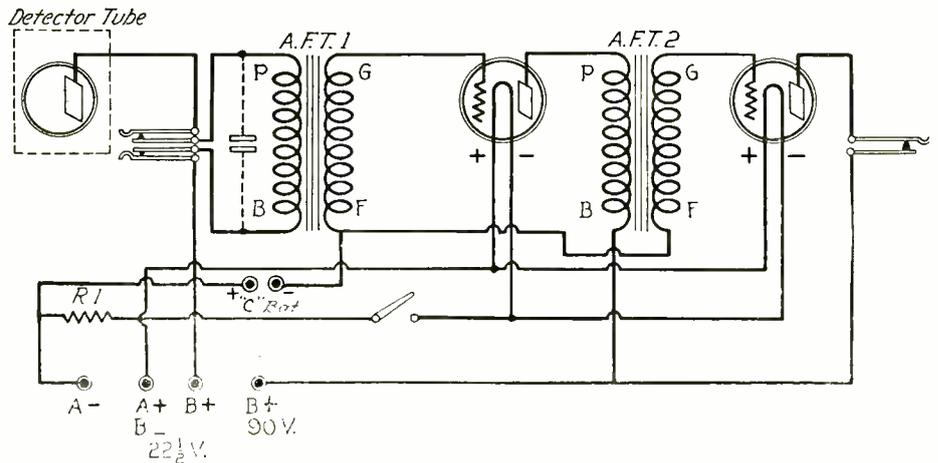
If the proper precautions are exercised to eliminate excess charges of electricity the aerial will constitute no danger whatever.

Electrical currents will always take the path of least resistance (not necessarily the shortest path) to the ground. Obviously, if the lightning were destined to strike a particular object, it may be diverted by a properly grounded aerial. It is a joke to say that the aerial attracts lightning.

Rules for Aerial and Ground

To be within the Fire Underwriters' rules you must be sure that your aerial conforms with the following specifications:

- (a) Aerial must not cross over or under any high-tension power lines.
- (b) Splices or joints must be soldered or



AUDIO-FREQUENCY amplification makes already-detected signals much louder. Two stages of transformer-coupled AF, added to any circuit (except a simple crystal set) will operate a speaker. Note how the C battery is connected. This battery is discussed in Gelula's article.

- (c) Leadin must be copper wire, well insulated, not smaller than No. 14.
 - (d) Leadin must not be less than 4" from the building.
 - (e) Leadin must enter building through an approved non-combustible, non-absorptive insulating bushing.
 - (f) An approved lightning protector must be placed outside the building.
 - (g) The protective ground wire should not be smaller than No. 14 gauge, copper preferably, run in as straight a line as possible to a water pipe or to a rod driven in moist ground.
- Observation of these rules also entails im-

connected with an approved splicing device.

where audio-frequency amplification is used, the C battery will aid tone and volume and afford economy of B battery consumption.

The C battery is placed in the grid return lead of the AF tubes. Instead of connecting one side of the secondary of the AFT or other coil to the negative filament, connect it to the negative C battery, the positive C battery to the negative A battery. The same C battery may be used for all stages of AF. In a detector stage do not use a C battery unless you know your subject thoroughly.

Noisy reception is due, nine times out of ten, to the B battery. Never allow the set
(Concluded on page 26)

40 Meters Fine for Night DX; 70 Far Excels in Daylight

By Thomas Stevenson

WASHINGTON

SCIENTISTS at the Bureau of Standards are rather disappointed with the results of observations on the effect of the eclipse on radio transmission and reception. Their tests on the broadcast band between 200 and 545 meters during the period of total eclipse revealed nothing which could not and has not occurred on any other day.

Tests at the Bellevue Laboratory, however, on high frequencies or low wave lengths were different. Several unusual things happened on these attributed to the eclipse.

Dr. Taylor's Findings

Dr. A. H. Taylor, in charge of the Bellevue Laboratory, observed the high frequencies and reports some rather startling effects.

"I took some observations on two English stations," says Dr. Taylor, "and found nothing that could be called peculiar about eclipse effects."

"For a short time during the eclipse I listened in on Cincinnati. During the eclipse the signal intensity increased tenfold and after the eclipse the signals faded completely out."

"However, out at Bellevue, we did not feel that anything of a striking nature would occur during the eclipse. We were convinced that if anything happened it would be on the high frequencies."

"There was a complete change over from daylight to dark during the eclipse. On the band between 75 and 80 meters the signals in some cases were 100 times stronger during the eclipse than just before or after."

40 Versus 70 Meters

Dr. Taylor reports a very interesting change in conditions on 40 meters as compared with 70. It seems that on 70 meters strong fading is experienced in the day time with strong signals at night, with exactly opposite conditions on 40 meters.

During the eclipse the Bellevue Laboratory had two transmitters in operation; one on 71½ meters with 9,000 watts in the antenna, and the other on 40 meters with 100 watts in the antenna.

"Just prior to the beginning of the eclipse," says Dr. Taylor, "the amateur stations on the band from 75 to 80 meters were rolling in from everywhere, and distant stations were coming in particularly good. There were one or two 40-meter stations coming in but only from great distances. During the eclipse the 75 to 80 meters stations came in very much stronger and particularly those cutting through the eclipse band. After the eclipse the signals of these stations went way down."

"On 40 meters there wasn't much doing before the eclipse. The signals of most stations were as dead as a doornail. After the eclipse the 40 meters stations began to come in fine."

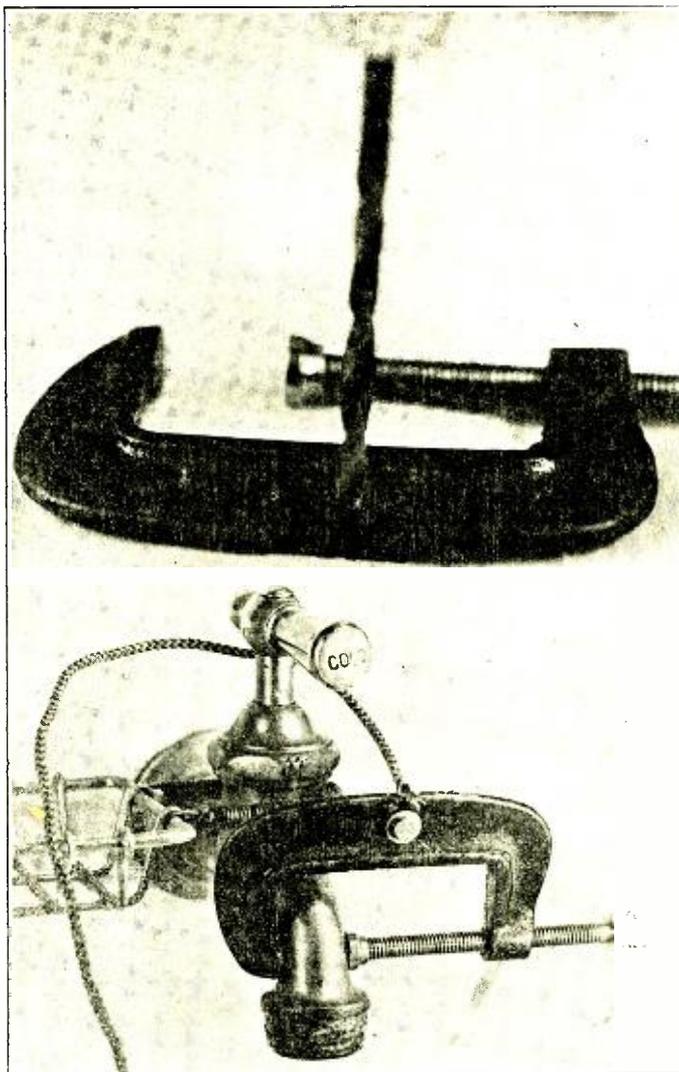
40 Meters Great for DX

Dr. Taylor said there is a station at Hartford on 54 meters with which he has worked every day. During the eclipse he could not pick up the signals of this station but they were heard in Florida very well.

It seems that the greater the distance, the better the reception on the high frequencies. In other words, the signals of a 40-meter station can be heard much better at 5,000 than at 500 miles.

As an example, Dr. Taylor asserts that

A Well-Made Ground Connection



HANDY way to make a ground clamp.

THE ground is very important in receiving. In fact, a good ground will often make a greater difference in reception than a correspondingly better aerial! Around the home of the average fan there are no streams or damp earth where a good ground may be obtained, so he must turn to the next best system—the cold water pipe. It is usually difficult to obtain a firm and electrically good connection on the average pipe. The system pictured above is a fine one. Drill a hole approximately in the center of the soft iron vise. A bolt secures the wire leading from the ground to the set. After scraping the pipe, secure the clamp firmly on the pipe. The soft iron can be drilled without trouble.

the signals of the 100-watt transmitter working on 40 meters were picked up at Santiago, while they could not be heard at Savannah.

Another interesting fact reported by Dr. Taylor is that the signals of the 100-watt transmitter on 40 meters were picked up just as well at Santiago as were those of the 9,000 watt-transmitted on 71½ meters.

(Copyright, 1925)

WDAR Now WLIT

WASHINGTON

THE call letters of the Lit Brothers station at Philadelphia have been changed from WDAR to WLIT, according to an announcement by the Radio Bureau.

New Broadcasters

SIX new Class A and one Class B stations were licensed by the Department of Commerce while one station transferred from Class A to B. The new stations follow:

Call	Stations	Meters	Watts
KFWB	Warner Bros. Pictures, Inc., 5842 Sunset Blvd., Hollywood, Cal.	252	500
KFWC	L. E. Wall & C. S. Myers, Stoddard Canyon, Upland, Cal.	211.1	10
WGBX	University of Maine, Orono, Me.	252	10
WGBY	The Progress Sales Co., R. No. 2, New Lebanon, O.	218.8	30
KFUZ	Y. M. C. A., 510½ Chestnut St., Virginia, Minn.	248	10
WGBW	Valley Theatre, 102 Erie St., Spring Valley, Illinois	212.6	20

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.

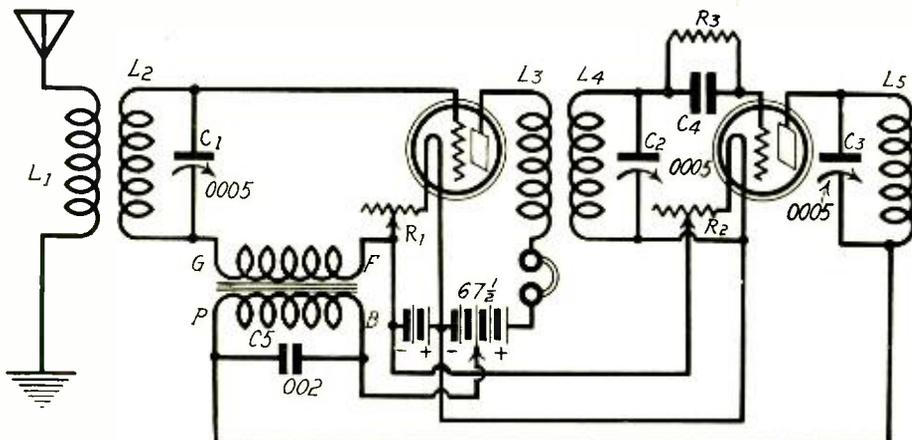


FIG. 94—The Transcontinental Reflex, two tubes operating as three. L1 and L3 are 10-turn coils wound over L2 and L4, respectively. L2 and L4 are 60-turn coils wound on a 3" form. L1 and L2, are in inductive relationship to each other as are L3 and L4. However, keep the coils L1 and L2 at a distance from L3 and L4. Short leads, high quality apparatus and good workmanship will assure you of fine results.

IN reference to the Transcontinental 2-tube set as described in the issue of Jan. 31, how many turns for L1, L3 and L4?—L. Smelli, 1996 Union St., San Francisco, Cal.

L1 and L3 are 10 turns. L3 is 50 turns. See Fig. 94.

CAN I use the set described by H. E. Wright (Transcontinental Reflex) in the issue of Jan. 31 with an additional stage of audio for portable use with a loop?—M. E. Harris, 244 W. 106th St., New York City.

I DESIRE to build the set by H. E. Wright as described in the issue of Jan. 31. Will it be all right to use the Elgin book-type condenser? (2) Will a 10-to-1 ALL-American AF transformer be all right for the first AF stage?—James C. Feltenzer, 1709 Pallister Ave., Detroit, Mich.

IN REFERENCE to the Superdyne described in the issue of Aug. 23, can this set be operated on a loop? (2) Could I use only two rheostats, detector and amplifiers? (3) What resistance should the rheostat be for 199 tubes?—Robert F. Page, 305 Ihmsen St., Pittsburgh, Pa.

WILL you please publish a small but efficient key transmitter?—Chas. H. Zahn, Pinckneyville, Ill. See Fig. 95.

IN the circuit by Lt. Peter V. O'Rourke as described in the issue of Dec. 20, what is the capacity of C2?—J. B. Wright, 915 Silver St., Philadelphia, Pa.

CAN the Uncle Sam coil be used in connection with the Anderson Superdyne? (2) Can a loop be used in the immediate vicinity of an outdoor aerial? (3) Will two outside aerials, at right angles to each other, work all right?—Joe H. Morgan, Box 102, Winona, Miss.

UP to about two months ago I was able to tune out completely our local station, KNKF. Lately, because of harmonics, (as I understand

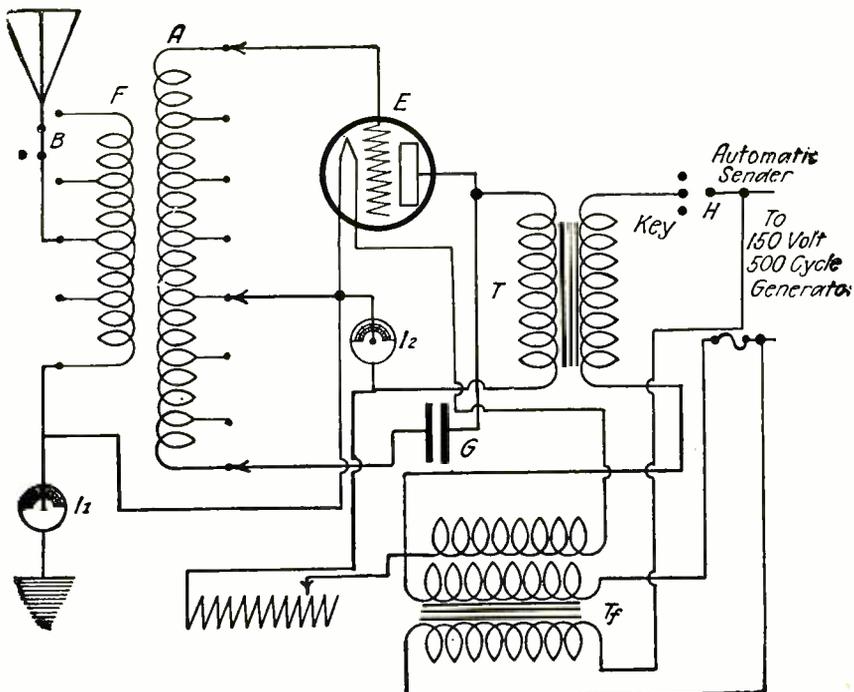


FIG. 95—Small but efficient 5-watt CW transmitter. F is a 15-turn coil wound on a 5" diameter form, tapped every third turn. A is the secondary, wound within the primary coil, and has 36-turns tapped every fourth turn. G is a 1 mfd. power condenser. T is a telephone transformer. A Ford spark coil will fill the purpose if you find it difficult to purchase a modulation transformer. A step-up transformer may take the place of the generator called for, if you have AC lighting mains.

(1) I, as well as many other local men, have been unable to tune it out.—Victor C. Smith, 125 E. Grant St., Shenandoah, Ia.

WE are sure if you let the Henry Field Seed Co. know of this fact, if it is fact, they certainly would co-operate with the listeners in trying to clear up this matter.

IS there any such thing as a rule for determining the dial settings for tuning to a desired station?

—E. H. Reynolds, 309 E. 29th St., Davenport, Ia. There is no standard method for determining the dial settings for a station not previously received, unless a factory test was made or a conversion system used. Approximate settings may be found out by the use of a chart. Get a sheet of graph paper (paper containing equal squares). Pencil out a square that includes approximately 400 of the little squares. Up the length of the left line write the wavelengths in

series of tens, thus: 200-210-220-230-240, etc. Along the lower horizontal plane write the dial settings in series of fives, thus: 5-10-15-20, etc. Now you are ready to plot the settings. You have, on your log, the settings of many stations already received. Select a station operating on a low wavelength. Plot, for instance, WNAC, 278 meters. Let us say it comes in about 12 on the dials. Place a dot where 278 on the left and 12 horizontally meet. Look up another station of another wave, let us say KDKA, which might come in about 23 (326 meters). Place a dot at the point where 326 on the vertical plane and 23 on the horizontal plane meet. Select another station, say WHN, 360 meters. Plot as above. Then select two more stations at correspondingly higher wavelengths, such as WEAJ, WNYC or KSD, and plot as described above. Of course, your dial settings are likely to be different than those mentioned above. Use your settings, not those given herewith. After you have the series of dots plotted, draw a line through them. The line would be slightly curved. Then, knowing the wavelength of a station, you can, with the aid of the graph, find out in a few seconds the approximate dial settings for any station.

OF all the Superdynes, which one would you advise me to build? (2) How much superior are the Meyers tubes for RF to the type 201A? (3) How are the Meyers tubes placed in the circuit for RF? (4) What is a grid return?—H. M. Hilpert, Winside, Neb.

IT would depend upon what qualities you are most desirous of having—Anderson's (Nov. 22 and 29) and Bernard's (Jan. 10, 17 and 24) reach the heights. Anderson's has three controls, Bernard's two. (2) The superiority is about 25%. (3) The same as any other tube, except for a special mounting. (4) The connection of a coil whose other terminal goes to the grid.

IS there such a thing in radio as a set that will not whistle when tuning in stations? (2) I understand that the Neurodyne will not. My friend has a Neurodyne of a well-known make and it certainly whistles. Is this as it should be? (3) Is the Superdyne supposed to whistle when tuning in?—W. V. Rubart, N. Main St., Urbana, O.

(1) The Neurodyne, the crystal; any non-regenerative receiver. (2) The Neurodyne set is not properly neutralized. (3) If properly and carefully tuned it will not whistle; otherwise, like any other regenerative set, it will.

ARE WD11s all right for the Transcontinental 2-tube set as described in the issue of Jan. 31? (2) Will enamel wire work all right in this set? (3) I can't quite understand how the primary and secondary coils are wound. (4) Would adding a C battery to this circuit improve the AF amplification and save B battery?—John Singer, 1820 Carr St., St. Louis, Mo.

(1) Yes. (2) Do not wind the coils for this set with enamel wire. (3) To wind the coils, start winding both the primary and secondary until 12 turns are wound for the primary and continuing with the secondary wire alone, or, wind the primary 12 turns first, then the secondary. (4) Yes.

IN reference to the Superflex as described in the issue of Dec. 27: (1) Can I use a commercial 3-circuit tuner? (2) In the description you say in one place primary 15 turns, secondary 35; in another place primary 10 turns, secondary 50; which is correct? (3) Can I plug in on a jack after the

second tube?—Leslie O. Martin, 335 State St., Brooklyn, N. Y.

(1) Yes, if the windings are approximately the same as stated in the article. (2) Primary 10 to 15 turns, secondary 50 turns. (3) Yes.

WILL you kindly give me a circuit showing how to use a fixed RF transformer and a tube detector?—James Creighton, 324 W. 47th St., New York City.

Fig. 96 gives the circuit you desire.

I HAVE a 5-tube factory-built Neutrodyne and was told that it was not properly neutralized. I get considerable noise. (1) Will you kindly tell me what is meant by proper neutralization? (2) Can I reneutralize the set myself or would it have to be sent back to the factory?—Geo. S. Warren.

The fact that you receive noise is due either to wornout B batteries, a leaky condenser or external interruptions. Determine whether the noise is caused by surrounding disturbances or whether it is caused by some action within the circuit of the set. If your set whistles while receiving a station it is not properly neutralized. However, before you readjust the neutrotons in the set, be sure that the whistles are not the result of other sets reradiating. (2) Yes. First tune in a station with medium volume on the phones. Take out the first RF tube, place a piece of paper on the filament prong of the socket and replace the tube. The filament will not light. If you cannot hear anything, that tube is neutralized. If you do hear the signal, slowly move the neutroton with a pencil until the signal disappears or is at minimum intensity. Remove the piece of paper from the prong. Repeat the process with the other RF tube. Your set then should be neutralized.

I WOULD like to build the 3-tube Superflex by Abner J. Gelula as described in the issue of Dec. 27. Could I use the Nazeley Roberts Units for the inductance coils for this set? (2) I have two .005 mfd. variable condensers. Will these be all right?—Maurice Rasker, 825 Walton Ave., Bronx, N. Y.

Yes. (2) Yes.

IN the 1925 Superdyne described by Herman Bernard, issues of Jan. 10, 17 and 24, can I connect two condensers instead of the split condenser on one shaft, as the circuit calls for?—H. B. Collins, 883 Blaine Ave., Detroit, Mich.

If you want three controls instead of two build Anderson's Superdyne, described in issues of Nov. 22, 29 and Dec. 6.

I BUILT the 1-tube DX set described by Lt. Peter V. O'Rourke, but cannot receive wavelengths above 476 meters; also I cannot tune out WCCO. Can you give me any suggestions that may clear up this trouble?—W. H. Sharp, Room 517, G. N. Ry. Bldg., St. Paul, Minn.

Add approximately 8 turns to the secondary. You neglected to state how low you can receive. You can make your set more selective by cutting down the length of the aerial, leadin and ground and reducing the coupling between coils to 1" or more. Also, selectivity sometimes may be obtained by cutting down the number of turns on the aperiodic primary. This may also decrease volume.

IN building the Super-Hetrodyne interfrequency transformers, in what direction are the transformers wound?—Francis L. Anthony, 7 Kimberly Ave., New Haven, Conn.

Wind all the coils clockwise.

HOW are the coils wound for the Superdyne? (2) Can I use 23-plate variable condensers? (3) Does the Superdyne radiate?—H. W. Steiner, Providence, Utah.

Primary 10 turns, secondary 55 turns, tickler 35 turns, on 3" diameter all in same direction. For the RF coupling transformer, primary 10 turns, secondary 55 turns. Use No. 22 DCC wire. (2) Yes. (3) It will radiate if not tuned properly.

RADIO WORLD'S Broadcast University

Questions and Answers on the Air Every Friday at 6.30 P. M. at WGBS, the Gimbel Bros. Station, New York City.—Department Conducted by RADIO WORLD'S Technical Staff.

IN regard to Lt. O'Rourke's 1-tube set as described in the issue of Dec. 6, will a 301A work as well as a type 12 tube? (2) In making a basketweave coil does it mean that two wires should be wound together for 18-turns and one wire continuing for 29 turns more? (3) Will a form using 1/4" dowls be all right? (4) What capacity is C2?—W. J. Jewhurst, Walkerville, Ont.

(1) Better. (2) Yes, but this fact does not necessarily mean that it is basketweave. Winding two coils at once makes coupling closer. (3) Yes. (4) .001 mfd.

WHICH SET would you advise for all-around purposes, distance and selectivity; the Anderson 4-tube Superdyne or the 5-tube resistance-

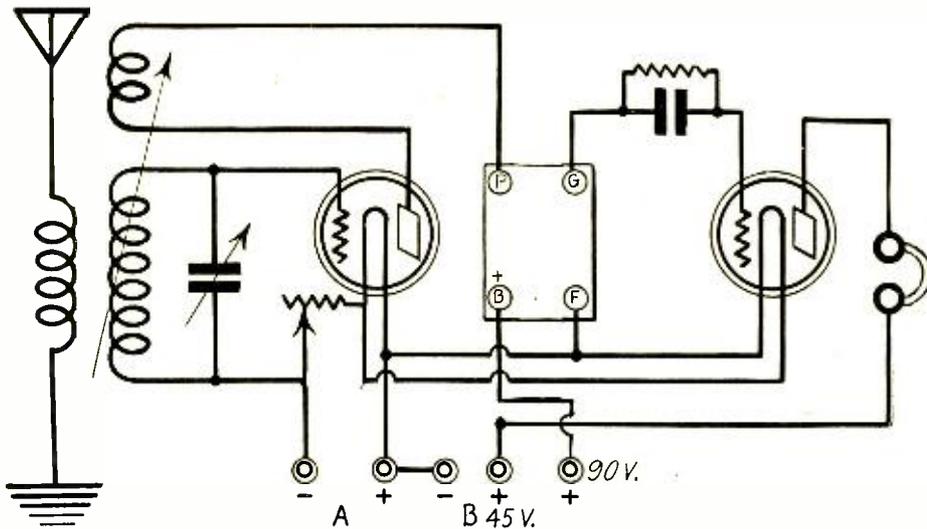


FIG. 96—One way of connecting a fixed RF transformer. By regenerating on the RF tube better stability will result, leaving the detector tube free for rectification. From 45 to 90 volts should be used on the RF tube, the customary voltage of 22 to 45 for the detector. This set has but two controls, secondary condenser and tickler. Wind 10 turns over the 50 turn secondary for the coupler, 35 turns for the tickler on a 3" diameter. A standard 3-circuit coupler will operate very efficiently in this circuit.

coupled set described in the issues of Aug. 23 and 30? (2) What is the wavelength scope of each?—S. S. Mizner, 1046 E. Prairie Ave., Decatur, Ill.

(1) We would advise the Anderson. (2) Anderson's, 200 to 560 meters.

HOW many turns is the so-called "standard" variometer? (2) What size wire should be used in winding a honeycomb coil?—B. Warden Fravel, Woodstock, Va.

(1) 18 on each side of the rotor and stator, i.e., 36 turns on the rotor and 36 turns on the stator. Use No. 20 DCC wire. (2) Approximately 20 to 24 DCC.

REFERRING to the DX Dandy as described in the issue of Oct. 4, would type 11 or 199 tubes be better for amplification than 201A? (2) What is the coupling between the 6 turns and the 20 turns? (3) Would winding the rotors reverse to the stators improve the circuit any? (4) would heavier wire be better?—R. A. Cogan, 2072 Esplanade St., Montreal, Can.

(1) Type 11. (2) About 1/2". (3) No. You may gain the same effect by reversing the leads. (4) Not in this circuit.

I HAVE trouble with my Ambassador 3-tube set. It is hard to get DX. The hookup is standard. I cannot get anything outside of the locals. WGBS comes in best of all. Can you suggest anything that I could do to enable me to get distance?—Henry Klotz, 47 Rutgers Ave., Jersey City, N. J. (Same question from H. Kraus, 563 Bushwick Ave., Brooklyn, N. Y.)

Often lack of distance may be traced to lack of ability to tune the set in a manner so that the circuit may be brought to resonance on a desired wavelength. Try various grid leak resistances, a variable gridleak, preferably. Be sure that your detector tube is functioning normally. Vary the B battery voltage.

I HAVE a 1-tube single circuit regenerative set that will receive KFI, Los Angeles, almost any night after locals sign off. Using an aperiodic primary, the set is not nearly as sensitive. I think I would have a better set if I made it three circuit. (2) How can I build a 3-circuit variometer? (3) How can I add an aperiodic primary to my Pfanstiehl coupler? (4) Which is better to control regeneration, tickler or variometer? (5) If regeneration can be used in the Neutrodyne, can you tell me how? (6) Will regenerating tuned RF or the Neutrodyne increase sensitivity?—Edwin P. Grigsby, Jr., Will, Va.

(1) Tuning will be a little more difficult, results better. (2) Primary 10 turns, secondary 50 turns, tickler 35 turns. Use No. 22 DCC wire on 3" diameter tubing. Primary wound over the sec-

ondary. (3) If the Pfanstiehl coupler you have reference to is of the 2-circuit type, why not use the variometer for the plate and use the 2-circuit coupler for primary and secondary? Tap the primary if you wish. (4) Variometer, if the tube is a good oscillator. (5) Place a variometer in the plate of the detector tube. The issue of Jan. 31 RADIO WORLD describes this. (6) Yes.

WOULD a lead-clad underground aerial deliver DX better than the outdoor type? (2) Are the present B battery eliminators now on the market practical?—Frank L. Wolff, 2309 W. Platte Ave., Colorado Springs, Colo.

(1) No. (2) Most of them are.

Among others whose questions were answered through WGBS were:

- W. D. Moore, 408 Sumner Ave., Brooklyn, N. Y.
- Owen McCarthy, 74 Nelson St., Brooklyn, N. Y.
- Edward W. Flayhart, 4241 Greenmount Ave., Baltimore, Md.
- Chas. M. Riley, 443 Mill St., Belleville, N. J.
- Joseph Badoski, 91 4th St., Plymouth, Pa.
- C. J. Boate, 2230 Diamond St., Philadelphia, Pa.
- George E. Richardson, Box 67, Thorndike, Mass.
- Frederick Wm. Foertsch, 173 Westervelt Ave., Paterson, N. J.
- Walter Hann, 138 Kipp Ave., Hashausk Heights, N. Y.
- B. B. Smith, 620 E. Monroe St., Little Falls, N. Y.
- Thomas T. Young, Shelter Island Heights, N. Y.
- Thos. C. Pratt, P. O. Box 40, N. Springfield, Vt.
- W. P. Hill, 134 Prospect St., Norwich, Conn.

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By Herbert E. Hayden

in Radio World, issue of October 4. Send 15 cents or start your subscription with that number.

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New York City

A \$5 HOME-MADE LOUDSPEAKER, by Herbert E. Hayden, in Feb. 7 issue. Send 15c for copy, RADIO WORLD, 1493 Broadway, New York City.

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Name

Street

City and State

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

James W. Knight, 1136 Broad St., Newark, N. J.
W. H. Raven, 19 Ross St., Pictou, Nova Scotia, Can.
John Listiak, Jr., Youngstown, O.
M. D. Potter, 106 W. 13th St., New York City.
Elec. & Radio Shop, P. O. Box 856, Los Angeles, Cal.
Joseph Brew, Jr., 505 5th, Freedom, Pa.
James M. Carment, Kamsack, Sask., Can.
Furlow Guerry, Americus, Ga.
Eugene Clark, Box 375, Quitman, Ga.
Word Johnson, Okolona, Miss.
R.onald G. Wessel, RFD 1, Wyanet, Ill.
Ernest Crislip, Rivesville, W. Va.
D. M. Keller, 83 Hill St., Dubuque, Ia.
F. H. Danforth, 50 N. Main St., Flemington, N. J.
Floyd Buesinger, Taylorville, Ill.
A. F. Olson, 2123 Fremont Ave. S., Minneapolis, Minn.
A. L. Funk, 765 Neal Ave., Massillon, O.
Montowese Ford Repair Shop, Montowese, Conn.
F. W. Allen, 4151 Harrison St., Chicago, Ill.
Paul A. Conard, 850 Macon St., Brooklyn, N. Y.
Peter J. Seizle, 1505 S. 25th St., Omaha, Neb.
Wm. J. Sullivan, Jr., Columbia Univ., Portland, Ore.
Jack Gilbough, Columbia Univ., Portland, Ore.
Gustave Johnson, Waseca, Minn.
The Rudholm Studio, Sauk Centre, Minn.
H. W. Seward, Cent. Y. M. C. A., Utica, N. Y.
Jerry Swoboda, Abie, Neb.
Sam Savage, Route 3, Box 4, Tulsa, Okla.
Reisman Radio Co., 1364 E. 19th St., Brooklyn, N. Y.
Lorraine Davis, Warsaw, Mo.
J. T. Rand, 3040 Hull Ave., Cheviot, Cincinnati, Ohio.
Jos. D. Tabeada, Samcto Spinetos, Cuba.
John L. McCullough, Rt. A., Box 171, San Fernando, Cal.

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FINANCING—Will negotiate with new enterprise, individual or established business needing capital. Incorporating attended to. Box 95, Wall Street Station, New York.

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RADIO TUBE MANUFACTURER WISHES connections with party who has an outlet for quality tubes; also wishes interest in same. Box M1, Radio World.

MUSIC STORE, EXCEPTIONAL LOCATION business thoroughfare, ideal spot for radio, must sacrifice at once. Box M2, Radio World.

RADIO, ELECTRICAL, CIVIL, ENGINEER; business experience; every phase radio; Frisco, Manhattan, London; honest, conservative party, familiar Western cities; confidential reports, general investigations, investment, advice; California agency solicited. Box M3, Radio World.

PHONOGRAPH-RADIO BUSINESS, ESTAB-lished 15 years, busy section New York City; exclusive territory Victor-Victrola, Sonora and Brunswick; also carry leading radios; \$25,000 over stock and fixtures secures business; excellent opportunity active man. Box M4, Radio World.

RADIO ENGINEERS CHANCE OF A LIFE-time; manufacturers, four years leading in radio parts, now entering the field of receiving sets; offer an exceptional opportunity to a consulting engineer capable of creating a new and improved circuit and set. Good compensation for original model and guaranteed interest in profits if set goes over. Applications will be treated in strict confidence, but must be clear and concise to receive consideration. Box M5, Radio World.

RADIO-STATE MANUFACTURING Licenses new radio receiving set; requires no batteries; operates from 60-cycle alternating current light socket; no hum; thorough demonstration any time, big demand. O2, Radio World.

The Radio Trade

Expired Tube Patent Doesn't Permit General Manufacture, Says De Forest Attorney

THE idea that on the recent expiration of the De Forest three-electrode vacuum tube patent any one would be permitted to manufacture the present type of thermionic radio tube was discussed by Samuel E. Darby, Jr., who has represented the De Forest Radio Company as attorney in patent litigation.

"It is only natural that during the seven-teen-year life of this patent that there has been much development of the basic invention of three-electrodes enclosed within an exhausted glass envelope—the tube. Many important inventions pertaining to process of manufacture, structure, design and material of the parts employed, as well as the structure of the device itself, have been perfected.

Cites Independent Patents

"The result is that while the basic idea of the employment of the three electrodes in the envelope is open for anyone's use without fear of infringement, the present highly efficient and scientifically developed radio tube is covered by upwards of a score of independent patents as to its details, any one of which would almost certainly be involved if one attempted to engage in the manufacture of a device or tube having an efficiency in any way comparable with that of manufacturers licensed under De Forest's generic patents.

"An analogy to this situation can very readily be found in the present very highly developed telephone. The original and

basic patent granted Alexander Bell, which covered the idea of being able to talk through the medium of an electrical current over a wire extended between two separate points, expired many years ago, but the developments, refinements and improvements, each independently patented, which go to make up the present equipment and mechanical service with which we are daily familiar, would prevent any one from duplicating this equipment and service, despite the expiration of the original Bell letters patent on this invention."

The Uses of the Tube

Captain Darby, discussing the tube patent, continued:

"The original conception as disclosed in this patent, No. 879,532, was of the three-electrodes—filament, grid and plate—enclosed within an exhausted glass envelope. The use contemplated in the patent was that of a detector and its inherent amplification qualities, due to the three electrodes and their circuits. Since that time the device has been developed so that its present uses are a hundredfold.

"In the radio art it is used at the transmission end for modulation, generation of the high-frequency currents to be transmitted, and amplification of the radio-frequency currents generated. At the receiving end it is used for detection, radio frequency and audio frequency amplification, and as an oscillator for heterodyne."

Coming Events

MARCH 2 TO 7—Fifth Annual Radio Show and Convention, Hotel Pennsylvania, New York City. Executive Radio Council, Second District.

MARCH 2 TO 7—Kansas City Radio Show, Convention Hall, Kansas City, Mo.

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

MARCH 9 TO 14—Cincinnati Radio Show, Music Hall.

APRIL 19 TO 25—International Radio Exposition, Steel Pier, Atlantic City, N. J.

SEPT.—(Early in month; date not settled.) Fourth Annual National Radio Exposition, by American Radio Exposition Co., 522 Fifth Ave., N. Y. C. Exposition will be held in Grand Central Palace.

SEPT. 14 TO 19—Second Radio World's Fair, 258th Field Artillery Armory, Kingsbridge Rd. and Jerome Ave., New York City.

SEPT. 14 TO 19—Pittsburgh Radio Show, Motor Square Garden. (Postponed from Jan. 19.)

SEPT. 15 TO 19—Washington (D. C.) Radio Show.

NOV. 9 TO 15—Milwaukee Radio Exposition, Civic Auditorium.

NOV. 17 TO 22—Fourth Annual Chicago Radio Exposition, Coliseum.

DEC. 1 TO 6—Boston Radio Show, Mechanic's Hall.

Date not set yet for exposition, also to be held in Chicago, direction of Harold Bolster.

RADIO WORLD'S 1925 MODEL 4-TUBE DX SUPERDYNE. Great for DX, volume and tonal quality. Only two controls. Constructional data is described by Herman Bernard in issues of January 10, 17 and 24. Trouble shooting in Jan. 31 issue. Tuning and theory of circuit described in Feb. 7 issue. 15c a copy. Send 75 cents, get all five copies, or start your subscription with the January 10 issue and follow Mr. Bernard's weekly articles on this great circuit. RADIO WORLD, 1493 Broadway, New York City.

New Corporations

Supertrol Laboratories, radio sets, \$100,000; W. L. and J. Williams, I. S. Roth. (Atty., C. E. Sutherland, 15 Park Row, New York City.)

Eurace Radio Corp., 500 shares, \$100 each; 5,000 common, \$10 each; active capital, \$100,000. A. C. Muller, R. E. Goll J. T. McNamee. (Atty., A. E. Venino, 59 Wall St., New York City.)

Atwood Elec. & Radio Corp., sets and supplies, \$100,000. James H. McMaster, Josiah Barfield, James Hull, Chicago; Adolph W. Kiemer, Oak Park, Ill. (Delaware Registration Trust Co.)

Brookline Radio Shops, \$25,000. M. Halper, A. Locurts. (Atty., M. Lefenfeld, 154 Nassau St., New York City.)

NAME CHANGES

Sherman Radio Distribution Co., to Sherman Radio Manufacturing Co.

BANKRUPTCY PROCEEDINGS

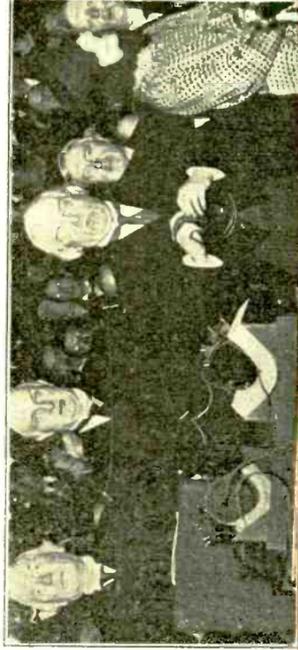
Dynamotive Radio Corp., 47 Ninth Ave., New York City. Liabilities, \$106,260; assets, \$8,000; main item being accounts, \$7,500. Principal creditors are Secore Reynolds & Co., \$55,500, secured; Ainmone Mfg. Co., \$4,456; G. H. Dexter & Sons, Windsor Lockers, Conn., \$4,354; Stanley & Patterson, \$5,232; Edgar T. Ward, Newark, N. J., \$3,347; Alden Mfg. Co., Springfield, Mass., \$2,772; Lehmaier, Schwartz Co., \$2,987.

"PAGE 5" SET GOES INTO

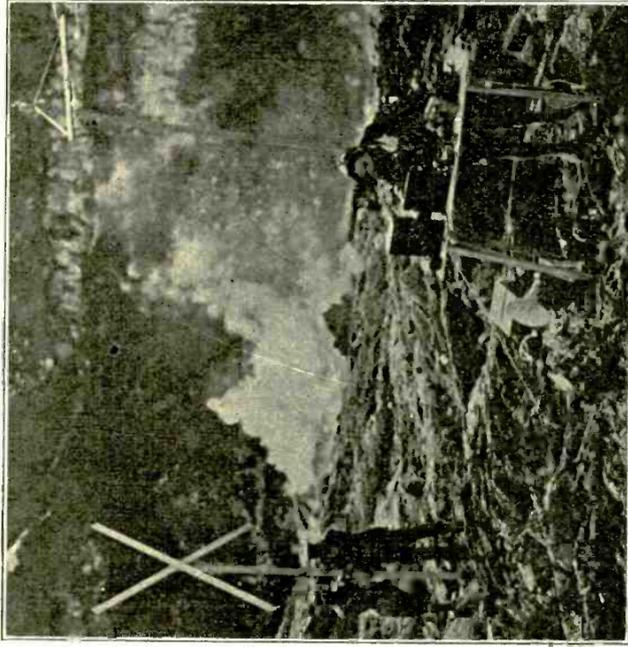
QUANTITY PRODUCTION

IN ANTICIPATION of a very great demand for their "Page 5" set, the R-B Radio Co. of 117 W. 51st St., New York City, have now reached quantity production on this item of their line. Sold with a guarantee by the manufacturer, this compact 5-tube, tuned radio-frequency set, the company says, will have an especial attractiveness to the radio trade because of the schedule which will go into effect when the set is marketed. This same feature, according to the officers of the company, together with the receiver's trim, neat appearance and substantial, solid construction, will have a like appeal to hosts of consumers.

Noted Quartet On Air



DURING the singing of the National Anthem at a rally of the Liberal Party at Albert Hall, London, which was broadcast, Herbert Asquith (now Earl of Oxford), Viscount Grey, Lloyd George and Margot Asquith constituted a quartet of famous for their political and literary achievements, if not for the splendor of their singing voices. The famous four are shown, left to right, in the order named. Note how Lloyd George is gaining weight. Evidently they don't broadcast daily dozens in England, or if they do he ignores them. (International Newsreel)



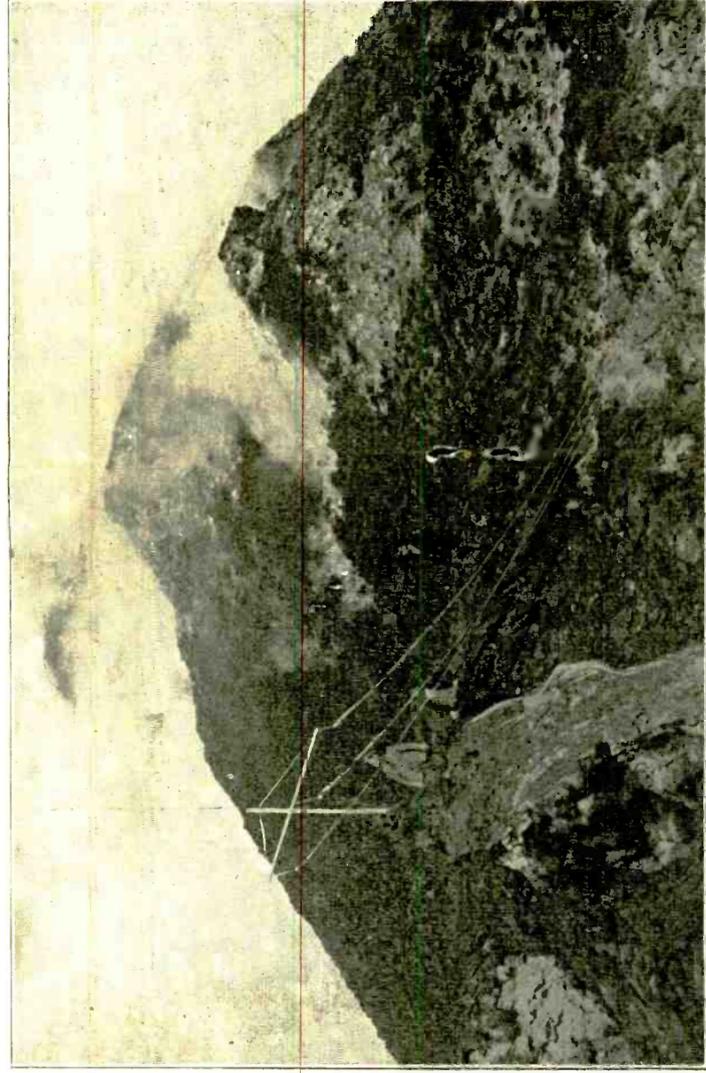
THE ACTUAL TEST of radio reception within the crater of Mt. Vesuvius, with smoldering recesses at hand and death-dealing gases filling the air, proved that reception on a loop was impossible within the eruptive zone. The loop was strung around the white cross shown in the photo. Note that the two men supporting the loop wear a gas mask, as does the man attempting to tune in a station. (International Newsreel)

"MY idea of a good aerial," said Harold Heit-muller, of Jersey City, N. J., shown at left, "is an ordinary empty iron water bucket. He rigged one up on the roof and attached the lead-in to his 5-tube tuned radio-frequency set, using also a good ground. Now he says he wouldn't change. (Kadel & Herbert)

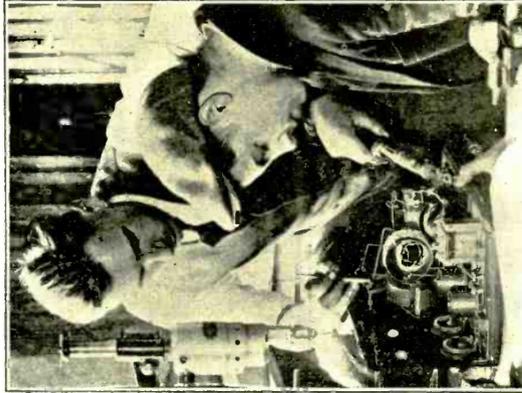


THOSE contemplating building or rewiring a 5-tube tuned radio-frequency set may profit by the arrangement used by one fan, as shown above. The wiring is from right to left, as one looks at the front of the set, instead of the usual left-to-right fashion. Basket-weave coils are used. (Kadel & Herbert).

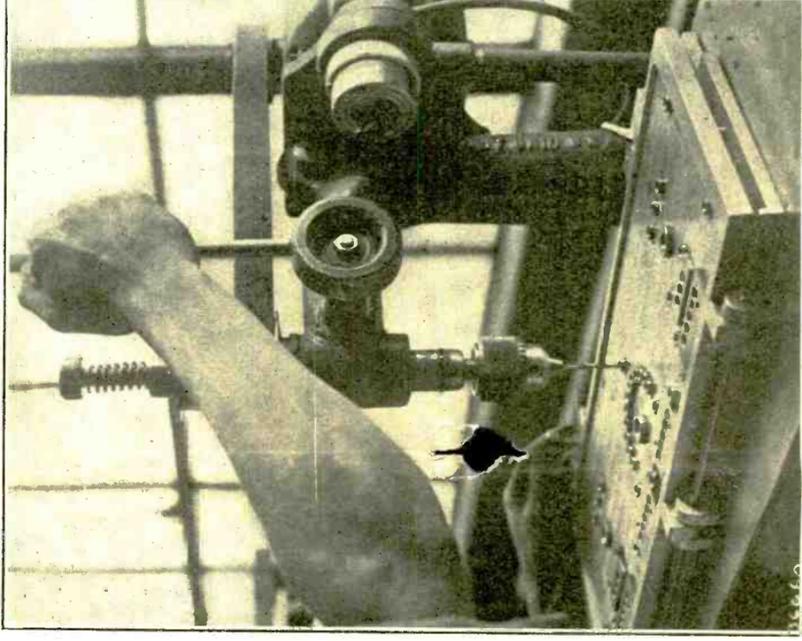
Perilous Radio Tests Made at Mt. Vesuvius



INTREPID men of science made the first test in history of whether radio reception was possible within the eruptive zone of Mt. Vesuvius. Even a broadcasting station nearby could not be heard when the aerial was strung up as shown in the above photo. When the party removed about 300 feet from the external fringe of the eruptive zone they tuned in a station on the aerial fairly well, but still the loop failed to produce results. Prof. Ricotti, of Milan, will submit a report on the experiments. (International Newsreel)



A GOOD SAMARITAN is Edward H. Jewett, radio manufacturer, who gives folk a chance to show if they have any device useful to radio manufacturers. Anybody with any ideas should write to Edward H. Jewett, Penobscot Bldg., Detroit, Mich., and mark the letter "personal" so it won't get mixed up with correspondence passed on to subordinates. (International Newsreel)



"PRETTY SOFT for these factory folk who drill panels," says the workday fan after a glance at the manner in which this work is done. The panel is cut to fit an aluminum jig, which is a metal frame on hinges that has a drilling template right on it. Through the apertures the drill is inserted, thus registering the panel at the very point desired. A variation of 1/100 of an inch is regarded as calamitous. (Underwood & Underwood)

Collins' Dying Heartbeats Heard



A 2-STAGE amplifier (one of push-pull) was used to listen to the heartbeats of Floyd Collins, as explorer trapped deep in the rocks at Cave City, Ky. For a few days, after attempts to reach him through the cave passage had failed, he was given up as futile, friends and family received the assurance he was still alive. This was done by a tube recording made by engineers who listened on earphones. An electric light wire that had been hung down to Collins was used as a medium for conveying the feeble sounds to the amplifier. Then the push-pull circuit was made loud enough to be audible. Some indication of Collins' condition was obtainable since doctors were told of the number of heartbeats per second. Unfortunately, the electric light at the end of the cable went out, and as the lamp when lit functioned as a transmitter of audible frequencies the hearing of the heartbeats ended. There was no radio-frequency aspect to this thrilling experiment. Collins was trapped when a rock shifted, catching his foot while he was in a half-sitting, half-reclining position. Drillers found Collins dead 18 days after he was trapped. (Wide World)

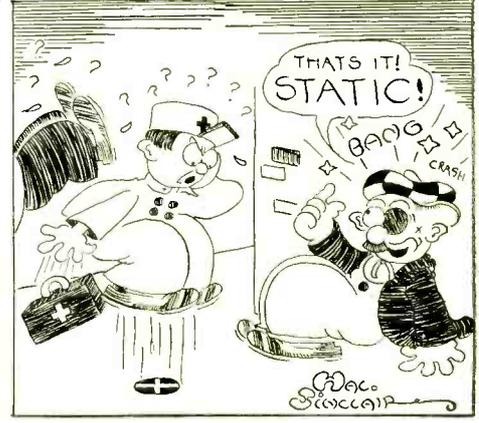


GAIL SAVAGE, shown above with two-stage transformer-coupled audio amplifier she made herself, won a silver cup in recognition of her tidy effort. (United)

MR. DX HOUND

A Character Created
by RADIO WORLD Artist

By HAL SINCLAIR



Dealers Criticized in Trade Survey

The object of RADIO WORLD'S survey is to determine (a) the state of the radio industry, a task being undertaken by RADIO WORLD'S Industrial Statistics Bureau; (b) the views of the general public on why there is such a small percentage of radio sets in use, compared with the number of homes; (c) to lay these facts and opinions before a committee of experts, to be announced later, for the purpose of having them submit a report, with recommendations to the public and the trade.

SURVEY EDITOR:

THE most frequent reason which my friends and acquaintances offer for not investing in radio equipment is that voice and music do not sound natural and demonstrations of equipment have prejudiced them against radio primarily on that account. Many whom I have invited to hear my set have remarked, "Now if I could only get a set that would sound like that I'd have one."

The trouble does not lie with the broadcasting stations, although some are admittedly poor. It is primarily in the receivers and I believe that the time is coming when manufacturers must consider the requirements of music lovers rather than DX hounds and design their circuits and controls with a view to quality first, then selectivity, volume, and DX in turn.

MURRAY C. HOBART,
2316 Isabella Street, Evanston, Ill.

SURVEY EDITOR:

I AM very much interested in the letter of the February 7 issue regarding jobbers selling at retail. If the retailers are actually serving the trade as they should there is no excuse for this, but let me sum up conditions here. A friend of mine can go into a certain store and get anything he wants at 25% discount because he works in a factory office.

There are a number of small stores pecking away at the business but they have not the stock to provide the service. In fact, I think the greatest trouble with radio is that most of it is handled by small and irresponsible dealers who sell a lot of junk for good money.

Naturally, I have bought practically all of my equipment out of town, as I certainly am not going to pay one-third more for equipment than somebody else. I think that the major part of the difficulties are up to the dealers themselves.

A DEALER.

SURVEY EDITOR:

ONE of the principal reasons there are not more interested in owning a radio set is that some unreliable parts or kits are foisted on those who would build their own sets. These kits are unsatisfactory in many cases. M. C. ANDREWS,
46 Barney St., Wilkes-Barre, Pa.

First New York Show of 1925 Opens On Monday

INTEREST in radio is enjoying an enlivened awakening with the propinquity of the fifth annual radio show and amateur convention of the Executive Radio Council, March 2-7, at the Hotel Pennsylvania, New York City.

Being the first radio show in New York City of 1925 it will afford opportunity for timely display of the latest models in sets and new devices. More than fifty of the leading manufacturers of radio sets and equipment will show these new models and devices for the first time to either the trade or the public.

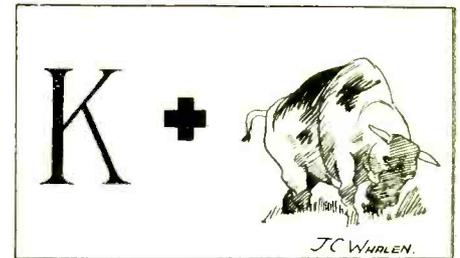
The balcony around the ballroom will hold booths of the radio divisions of the Army, Navy and Signal Corps. Broadcasting by WJZ of headliners will take place from a replica of the WJZ studio.

Co-operating with the Boy Scout Foundation of Greater New York, the managers of the show have designated Wednesday, March 4, "Boy Scout Day." Special addresses of interest to scout radio will be given in the lecture hall. A set building contest for the best portable receiver for use on hikes or at camp has been arranged with valuable prizes to scouts competing.

To appeal to the women of the radio listener and radio interested bodies, a special "Women's Afternoon," under the direction of Theresa Nagel, interviewer and announcer at WGBS, will be held in the lecture hall Thursday, March 5. During the show theatrical folk will entertain, including Bessie Love and Vincent Lopez.

The Weekly Rebus

WHAT do these rebuses represent?
Send answer to Rebus Editor,
RADIO WORLD, 1493 Broadway, New York City.



The names of those sending the solution will be published.

Solvers of Previous Rebuses

- Herman Bartels, 173 1/2 Hutton St., Jersey City, N. J.
- Ed. L. Clark, 246 W. 5th St., Erie, Pa.
- Francis Carroll, 712 Turtle St., Syracuse, N. Y.
- Lyle Masterbrook, 415 3rd St., N. W. Rochester, Minn.
- Frank Paul, Jr., 1742 Lull Pl., Chicago, Ill.
- Ray Herr, 1817 Webster St., Ft. Madison, Ia.
- Margaret Thackeray, Rt. 1, Madison, Kan.
- Virgil T. Olson, 615 Florence St., Turlock, Cal.
- Milton Tapert, 2975 Springale Ave., Detroit, Mich.
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- Francis Carroll, 712 Turtle St., Syracuse, N. Y.
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- Max H. Hopf, Harper, Tex.
- L. C. Long, 2447 College Ave., Indianapolis, Ind.
- Eugene Buser, 611 Central Ave., W. Hoboken, N. J.
- Gerald Darf, 2026 Boudan St., Muskegon, Mich.
- Jas. R. Petty, 2065 Taylor Ave., Columbus, O.
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- Wm. C. Mayer, 1305 E. 124th St., Cleveland, O.
- Lamar Clark, Louisville, Ga., Box 174.

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.

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- Elma Carter, W. Hackberry St., Salem, Ind.
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A. B. C. Editor, RADIO WORLD,
1493 Broadway, New York City.

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

Name

Address

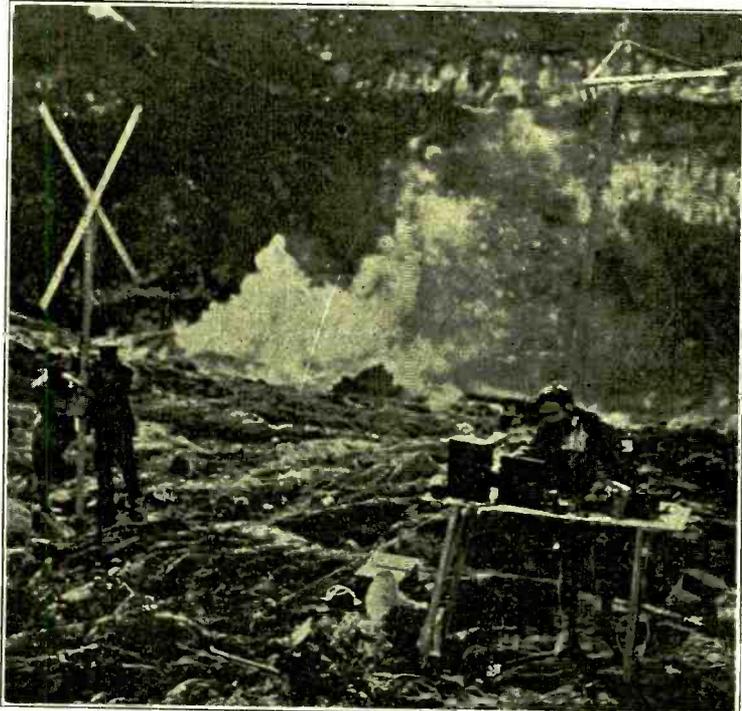
City or Town

State

Noted Quartet On Air



DURING the singing of the National Anthem at a rally of the Liberal Party at Albert Hall, London, which was broadcast, Herbert Asquith (now Earl of Oxford), Viscount Grey, Lloyd George and Margot Asquith constituted a quartet famous for their political and literary achievements, if not for the splendor of their singing voices. The famous four are shown, left to right, in the order named. Note how Lloyd George is gaining weight. Evidently they don't broadcast daily dozens in England, or if they do he ignores them. (International Newsreel)

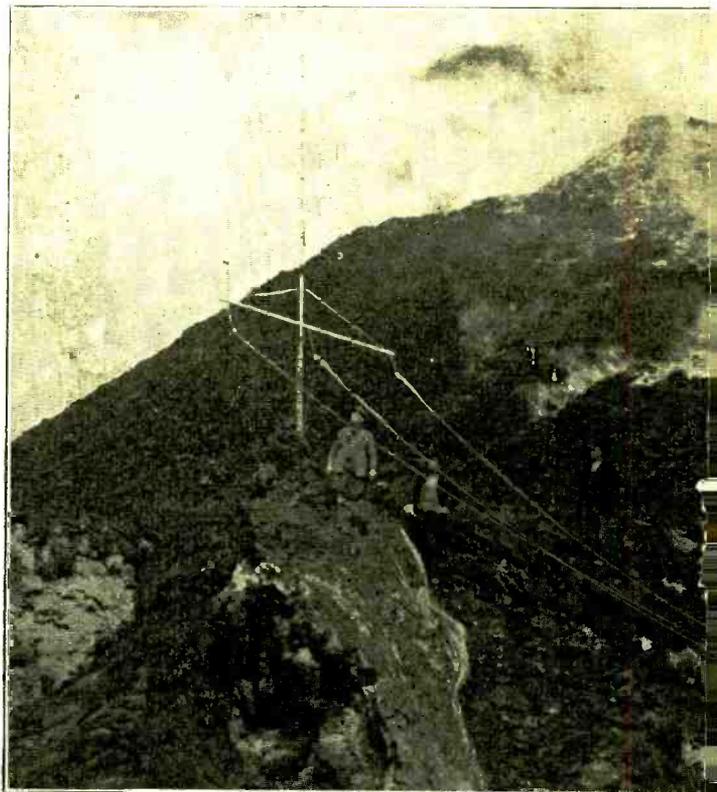


THE ACTUAL TEST of radio reception within the crater of Mt. Vesuvius, with smoldering recesses at hand and death-dealing gases filling the air, proved that reception on a loop was impossible within the eruptive zone. The loop was strung around the white cross shown in the photo. Note that the two men supporting the loop wear a gas mask, as does the man attempting to tune in a station. (International Newsreel)

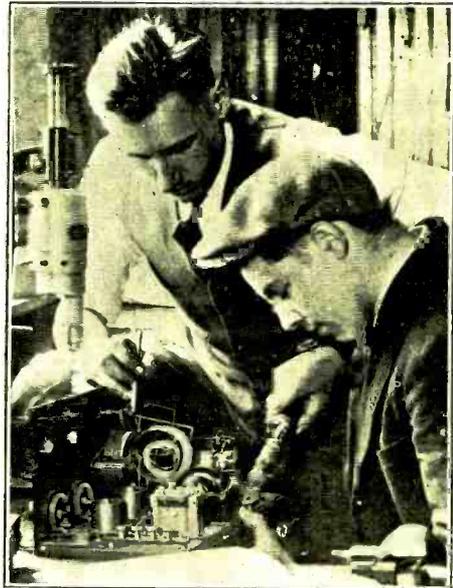


"MY idea of a good aerial," said Harold Heitmiller, of Jersey City, N. J., shown at left, "is an ordinary empty iron water pail." So he rigged one up on the roof and attached the lead-in to his 5-tube tuned radio-frequency set, using also a good ground. Now he says he wouldn't change. (Kadel & Herbert)

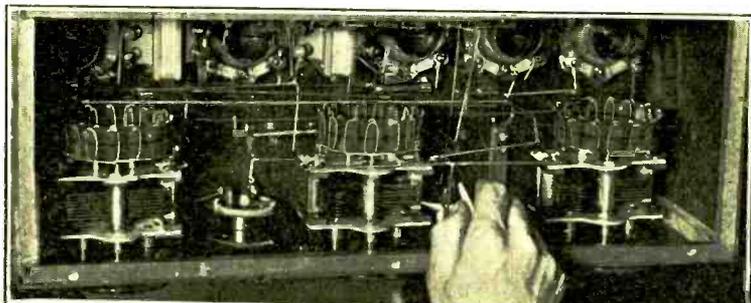
Perilous Radio Tests Mac



INTREPID men of science and engineering made reception was possible at a radio casting station nearby shown in the above photo. The external fringe of the loop was well, but still the loop submit a report.



A GOOD SAMARITAN is Edward H. Jewett, radio manufacturer, who gives folk a chance to show if they have any device useful to radio manufacturers. Anybody with any ideas should write to Edward H. Jewett, Penobscot Bldg., Detroit, Mich., and mark the letter "personal" so it won't get mixed up with correspondence passed on to subordinates. (International Newsreel)

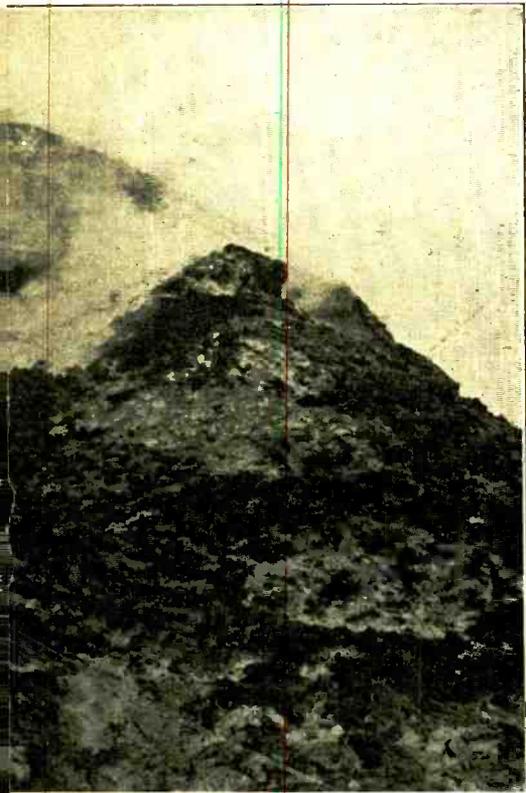


THOSE contemplating building or rewiring a 5-tube tuned radio-frequency set may profit by the arrangement used by one fan, as shown above. The wiring is from right to left, as one looks at the front of the set, instead of the usual left-to-right fashion. Basket-weave coils are used. (Kadel & Herbert).

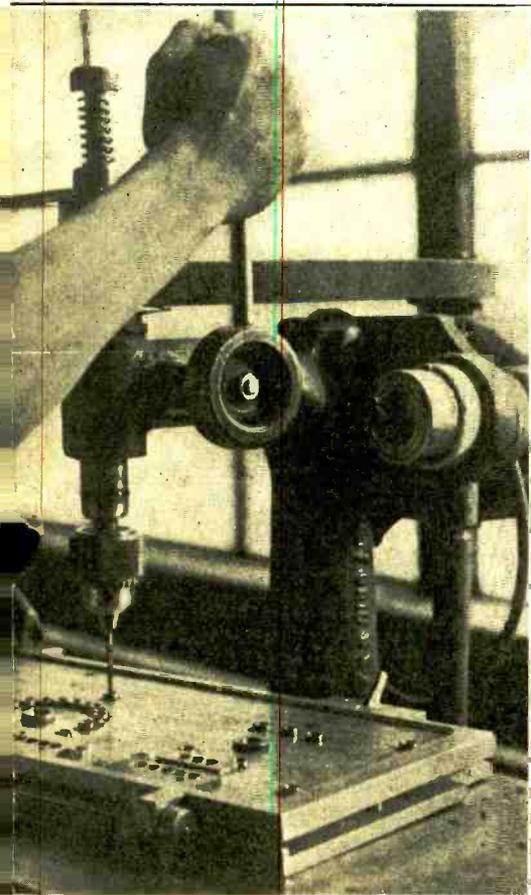


"PRETTY SOFT" for a fan after a glance at the arrangement used by one fan, as shown above. The wiring is from right to left, as one looks at the front of the set, instead of the usual left-to-right fashion. Basket-weave coils are used. (Kadel & Herbert).

...e at Mt. Vesuvius



ience made the first test in history of whether radio within the eruptive zone of Mt. Vesuvius. Even a broad- could not be heard when the aerial was strung up as oto. When the party removed about 300 feet from the eruptive zone they tuned in a station on the aerial fairly failed to produce results. Prof. Ricotti, of Milan, will t on the experiments. (International Newsreel).

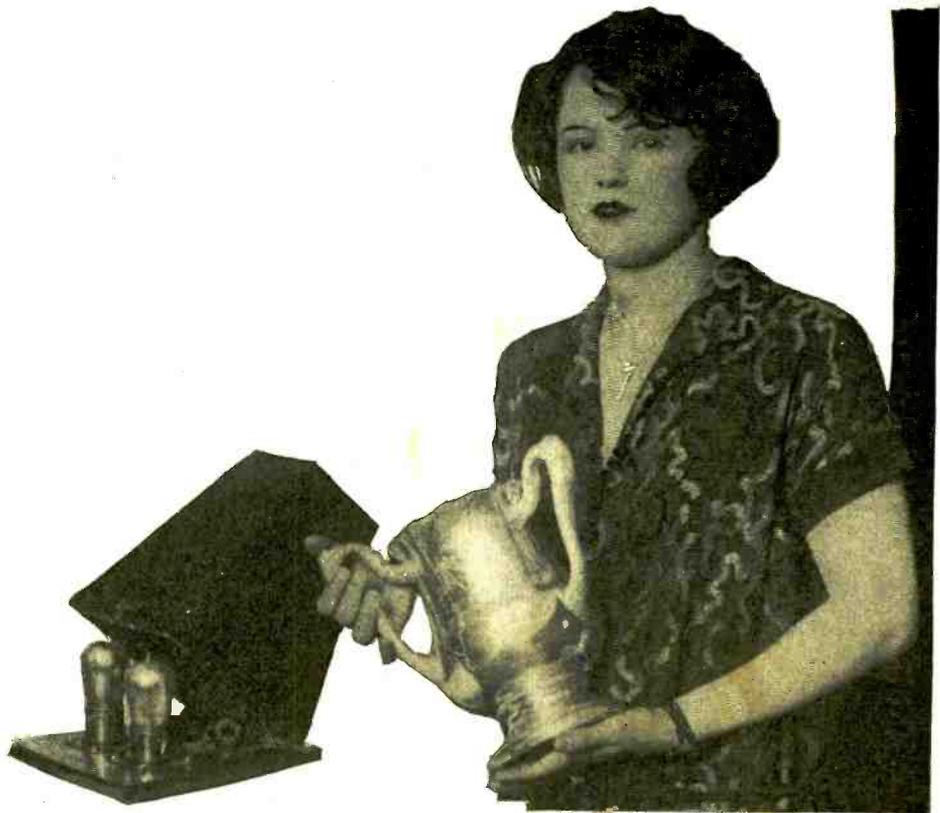


those factory folk who drill panels," says the workaday the manner in which this work is done. The panel is cut g, which is a metal frame on hinges that has a drilling Through the apertures the drill is inserted, thus meeting point desired. A variation of 1/100 of an inch is regarded alamitous. (Underwood & Underwood)

Collins' Dying Heartbeats Heard



A 2-STAGE amplifier (one of push-pull) was used to listen to the heartbeats of Floyd Collins, cave explorer trapped deep in the rocks at Cave City, Ky. For a few days, after attempts to reach him through the closing passageway had been given up as futile, friends and family received the assurance he was still alive. This was due to the heartbeat recording made by engineers who listened on earphones. An electric light wire that had been run down to Collins was used as a medium for conveying the feeble sounds to the amplifier. There the pulsations were made loud enough to be audible. Some indication of Collins' condition was obtainable, since doctors were told of the number of heartbeats per second. Unfortunately, the electric light at the end of the cable went out, and as the lamp when lit functioned as a transmitter of audible frequencies, the hearing of the heartbeats ended. There was no radio-frequency aspect to this thrilling experiment. Collins was trapped when a rock shifted, catching his foot while he was in a half-sitting, half-reclining position. Drillers found Collins dead 18 days after he was trapped. (Wide World)



GAIL SAVAGE, shown above with two-stage transformer-coupled audio amplifier she made herself, won a silver cup in recognition of her tidy effort. (United).

Bernard at WGBS Friday

BROADCAST PROGRAMS

Thursday, February 26

KFDY, Brookings, S. D., 273 (C. S. T.)—8 P. M., concert by the State College Military band. 8:20, "Seasonable Seeding," by Dr. A. N. Hume. 8:30, news items and announcements. 8:35, "Care of Bees in Spring," by H. C. Severin. 8:45, concert by State College Military band.

KGO, Oakland, Cal., 300 (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. 6:45, final reading; stock reports, weather, S. F. produce news, and news. 8, "Seven Keys to Baldpate," a melodramatic farce. 10, Henry Halstead's Orch.

KOA, Denver, Colo., 323 (M. S. T.)—12 M., organ recital. 1 P. M., N. Y. stock reports, livestock, fruit and vegetable report and weather. 3, half hour for housewives. 6, final reading N. Y. stock reports, livestock, vegetables and news.

WDAF, Kansas City, Mo., 366 (C. S. T.)—3:30 P. M., the Star's Radio Trio. 5:50, marketgram, weather, time and road report. 6, reading. Cecile Burton; book talks by Louis Mecker; the Tell-Me-a-Story Lady; Trianon Ensemble. 11:45, Nighthawk Frolic.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 1:30, P. M., concert by Civic Music Club, 5, children's program. 7:15, market, weather, news and police. 8, the Oregonian Orch. 10, Multnomah Hotel Strollers.

WWJ, Detroit, 353 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "to-night's dinner," and a special talk. 9:45, Public Health Service bulletins. 10:25, weather. 11:55, time. 12:05 P. M., Jules Klein's Hotel Statler Orch. 3, News Orch. 3:50, weather. 3:55, market reports. 6, dinner concert. 8:30, News Orch.; Mme. Homer DuBard, soprano; Graeme Gillies, bass; Jean Loughhead and Theone Hubbard. 10, Jean Goldkette's Victor Recording Orch. 11:30, the Detroit News Orch.; Wilfred Head, composer-pianist.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeeze time for children. 5:57, time.

KSD, St. Louis, Mo., 545 (C. S. T.)—4 P. M., the home hour. 7, Hay's orch. 9, recital by Mabel Hall, soprano; Mrs. H. J. Beckemeyer, contralto; Mrs. Mamie Charles Towey, accompanist; address by Dr. L. D. LeGear.

WGY, Schenectady, N. Y., 380 (E. S. T.)—2 P. M., music; "Good Taste in Home Decoration," Alice St. John. 2:30, organ recital by Stephen E. Boisclair. 6:30, dinner music by Hotel Ten Eyck trio. 7:30, "A Few Moments with New Books," by L. L. Hopkins. 7:45, WGY orch. 8:15, comedy, "Going Some," WGY Players. 11:15, organ recital by Stephen E. Boisclair.

WIP, Philadelphia, 509 (E. S. T.)—1 P. M., luncheon music. 1:30, weather. 3, Irene Muckle, pianist; Ruth Purvis, soprano; Lawrence Sommers, violinist, and Marion Roller and Bernice Scott in a piano selection. 6, weather. 6:05, "The Citizens' Military Training Camp Association," by Lieutenant S. Gordon Smyth. 6:15, W. Irving Oppenheim Concert orch. 7, Uncle Wip's roll call and birthday list. 8, "The Child Labor Question," a talk. 8:15, direct broadcast from the Eastern State Penitentiary, given entirely by the inmates. 11, dance music by Harvey Marburger and his Vaudeville orch.

WMAK, Lockport, N. Y., 265 (E. S. T.)—12 M., Murray Whiteman's Midnight Serenaders.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Jack Cohen, pianist. 10:20, Juanita Plummer, on "Child Adoption." 10:30, Jack Cohen. 10:40, Lillian Regan, fashion expert. 10:50, Jack Cohen. 1:30 P. M., scripture reading. 1:35, Judith Roth, songster; Mae Singh Breen, banjoist; Dean Moore, entertainer, and Peter de Rose, pianist. 3, interview with Betty Ross and Rita Weiman. 3:10, Lillian Menecker, soprano. 3:20, Louise Rice, on graphology. 3:30, Lillian Menecker, soprano. 3:40, interview. 3:50, Lillian Menecker, soprano. 6, Uncle Geehee. 6:30, the Jersey Collegians. 7, "What the World Is Doing." 7:10, the Jersey collegians. 7:30, Armand Vecsey, Concert orch. 8:30, Oliver Saylor, "Footlight and Lamplight." 9, A. Rappaport, Russian tenor. 9:30, Piccadilly program. 11, Macy and Scott, the Radio Aces." 11:30, Russian Eagle orch.

WEAF, New York City, 492 (E. S. T.)—11 A. M., musical program and talks to housewives; market and weather. 4 P. M., Donald Fisel, baritone; "Color Harmony" by Phillip H. Pratt. 6, dinner music; mid-week services; art talk; Giuseppe Di Benedetto, operatic tenor; Winifred Bauer, pianist; Columbia University on Contem-

porary English Fiction; "Touring"; Victor presentation; the Silvertown Chord orch.; Vincent Lopez and his orch.

KHJ, Los Angeles, 404 (P. S. T.)—12:30 P. M., program courtesy Loew's State. 2:30, matinee musicale. 6, Art Hickman's Concert orch. 6:30, children's program. 7:30, Harold Swartz of Otis Art Institute. 7:45, Dr. Philip M. Lovell on "Care of the Body." 8, de luxe program. 9:30, program presenting the Piggly Wiggly Girls. 10, Art Hickman's Dance orch.

KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—9:45 A. M., stockman reports. 11:15, time. 12, P. M., weather; stockman reports. 12:20, Lenten services. 3:30, closing quotations on markets. 6:15, dinner concert by Broudy's orch. 7:15, stockman reports. 7:30, Uncle Ed. 8, "Diseases of Newborn Calves," by Dr. C. J. Millen; "Light Opera Diets for Invalids," by Norma J. Davis. "Forestry Problems," by Edmund Secrest. 8:30, concert by KDKA Little Symphony orch. 9:55, time; weather. 11, concert from Post Studio.

KYW, Chicago, Ill., 536 (C. S. T.)—6:30 A. M., morning exercises. 9:30, late news and comments of the financial and commercial markets. 11:35, table talk by Mrs. Anna J. Peterson. 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, DeBabary's orch. 7:33, speeches under auspices of the American Farm Bureau. 8, "Twenty Minutes of Good Reading." 8:20, Edna DeLee, soprano; Lewis Meehan, tenor; Thomas W. Carey, Banjo; Thomas B. Stephenson, requests. 9:15, "Good Roads" report. 10, "Evening at Home" program. 1, "Insomnia Club."

WEAR, Cleveland, O., 390 (E. S. T.)—7 P. M., Metcalf Memorial organ recital. 8, fine arts program.

WRC, Washington, D. C., 469 (E. S. T.)—6:45 P. M., children's hour. 7, dinner music by the Lee House trio. 8:15, "Habits of Ants," by Dr. Wm. M. Mann. 8:30, "Going Some," by WGY players. 10:45, Jacques Green and his Club Deauville orch.

WJY, New York City, 405 (E. S. T.)—7:30 P. M., "Income Taxes," Frank Shevit. 7:45, Mischa Goodman, violinist; Rose Firestone, accompanist. 8, "A Digest of Outstanding Magazine Articles for March," by Walter F. Gruening. 8:15, Mischa Goodman. 8:30, "Going Some," comedy by WGY players. 10:30, Pierre's orch.

WJZ, New York City, 455 (E. S. T.)—10 A. M., Housewives League daily menu; Mrs. Julian Heath. 10:20, Review of Reviews. 10:30, household equipment talk by Ethel Peysor. 10:40, needle art talk. 10:50, Eleanor Gunn's fashion talk. 12, Lenten service. 1 P. M., Nathan Abas' orch. 4, Katherine DeWitt Crocco, soprano. 4:15, "Highways of Travel," Wirt W. Barnitz. 4:30, Bernhard Levitow's orch. 5:30, State and Federal agricultural reports. 7, Bernhard Levitow's orch. 7:55, "News from Nowhere," John B. Kennedy. 8, Wall Street Journal Review. 8:10, "Advertising," Geo. B. Hotchkiss. 8:30, Wanamaker organ recital. 9:30, Australian program. 10:45, Jacques Green and his Club Deauville orch. 11:45, Olga Steck, songs.

WMC, Memphis, Tenn., 500 (E. S. T.)—8:30 P. M., weekly organ recital by Harry O. Nichols.

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, organ and trumpets. 9:55, time. 10:02, weather.

Friday, February 27

KGO, Oakland, Cal., 300 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports and weather. 3, studio musical program and speaker. 4, concert orch. 6:45, stock reports, weather, S. F. produce news, and news.

KOA, Denver, Colo., 323 (M. S. T.)—12 M., organ recital. 1 P. M., N. Y. stock reports, livestock, fruit and vegetable report and weather. 3, half hour matinee for housewives. 6, final reading N. Y. stock reports, livestock, vegetables and news. 6:40, book knowledge program. 8, ten minutes of music from Fred Schmitt's Rialto Orch. 8:10, studio program.

WDAF, Kansas City, Mo., 366 (C. S. T.)—3:30 P. M., Radio Trio. 5:50, marketgram, weather, time and road report. 6, speaker from the Kansas City Children's Bureau; the Tell-Me-a-Story Lady; the Trianon Ensemble. 8, popular program. 11:45, Nighthawk Frolic.

WWJ, Detroit, 353 (E. S. T.)—8 A. M., setting-up exercises. 29:30, "to-night's dinner" and a special talk. 9:45, Public Health Service bulletin. 10:25, weather. 11:55, time. 12:05 P. M., Jules Klein's Hotel Statler Orch. 3, News Orch. 3:50, weather. 3:55, market reports. 6, dinner concert. 8:30, the Detroit News Orch.; Anne Campbell, poet; Mrs. Claudine Secor, soprano; Norman Butterfield, baritone; the Three Knights of Harmony.

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, news and police. 8, lecture by University of Oregon. 10:30, Hoot Owls.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble

and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeeze time for children. 5:57, time.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Katherine Godfrey, soprano. 10:20, Hattie M. Hamburger, reader. 10:30, Katherine Godfrey, soprano. 10:40, Maybelle A. Burbridge, beauty talk. 10:50, Katherine Godfrey, soprano. 1:30 P. M., scripture reading. 1:35, Elizabeth White, violinist and Beatrice Ragsdale, concert pianist. 3, interview with Sylvia Field and Ruth Gordon of "Mrs. Partridge Presents." 3:10, Eleanor Davis, soprano. 3:40, Dr. Alfred G. Robyn, harmony and composition lessons. 3:50, Eleanor Davis, soprano. 6, Uncle Geehee. 6:30, Herman Bernard, managing editor RADIO WORLD, "Hookups, Questions and Answers." 6:40, Larry Funk's orch.

KSD, St. Louis, Mo., 545 (C. S. T.)—8 P. M., concert by St. Louis Symphony orch.; Rudolph Ganz, conductor.

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

WPG, Atlantic City, 300 (E. S. T.)—7 P. M., Traymore dinner music. 9, Hotel Ambassador concert orch. 10, studio recital. 11, dance music.

WGY, Schenectady, N. Y., 380 (E. S. T.)—2 P. M., music; health hints, by Dr. C. W. Woodall. 6:30, International Sunday School lesson. 7, Mark Strand Theatre orch. 7:30, health talk. 7:45, address, "The Dawes Plan and European Reconstruction," Dr. George H. Derry. 8, Bell Record orch. 9, old time favorites by Mary Zoller, xylophone, and WGY orch. 10:30, Edison Club Quartet; Rice String Quartet and American Trio.

KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—7 A. M., morning exercises. 8, morning exercises. 9:45, stockman reports. 11:55, time. 12, weather; stockman reports. 12:20 P. M., Sunday School lesson. 3:30, quotations on hay, grain and feed. 6:15, dinner concert by Charlie Gaylord's orch. 7:15, stockman reports. 7:30, Daddy Winkum. 8:15, "Goltre and Its Prevention." 8:30, concert by Reick-McJunkin Co. 9:55, time; weather.

WIP, Philadelphia, Pa., 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. 3:15, Ida Millietie, soprano; Lynore McNulty, mezzo soprano; Earnest Wilby, tenor; Magnus Shilling, basso. 4, "Our Relations With Latin America," by Dr. Harry T. Collings. 6, weather. 6:05, popular numbers by Mark Fisher and Joe Burke. 6:15, Harvey Marburger and his vaudeville orch. 6:45, livestock and produce market reports. 7, Uncle Wip's bedtime story, roll call and birthday list.

WEAF, New York City, 492 (E. S. T.)—11 A. M., "England's Present Foreign Policy," by Herbert Adams Gibbons, lecturer and author. 4 P. M., Estelle Myers, soprano; French lessons by William Douo-Kerr; children's stories. 6, dinner music; Win. B. Mackay on "Bridging the Hudson"; Carl Frederick Hogreluis, baritone; stories for children, by Blanche Wade; Jimmie Clark, pianist; The Happiness Candy Boys; Mayo Wadler, violinist; Astor Coffee orch.; Rudolph Luks String Ensemble; Meyer Davis' orch.

KYW, Chicago, 536 (C. S. T.)—6:30 A. M., morning exercises. 9:30, late news and comment of the financial and commercial markets. 11:35, table talk by Mrs. Anna J. Peterson. 12:30 P. M., "The Progress of the World." 6, 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. 9, midnight revue. 1, "Insomnia Club."

WJY, New York City, 405 (E. S. T.)—7:30 P. M., Billy Wynne's Greenwich Village Inn orch. 8:15, review of work of N. Y. Assembly by Julius S. Berg. 8:30, sea songs by William Ballyn. 8:45, Looseleaf Current Topics. 9, Genesee Society dinner direct from Hotel Commodore. 9:45, "The Texans," Sanchez & Milstead, popular songs. 10, Monte Carlo Virginians.

WJZ, New York City, 455 (E. S. T.)—10 A. M., Housewives League Daily Menu; 10:20, "Books," Grace Colbron. 10:30, good housekeeping talk. 10:40, arts and decorations. 10:50, Eleanor Gunn's fashion talk. 12:15 P. M., noon hour of music. 1, Hotel Ambassador Trio; Henry Van Der Zanden, director. 4, Maddalena Houff, soprano. 5:30, State and Federal reports. 7, Bernhard Levitow's orch. 8, Wall Street Review. 8:10 NYU Air College; "Psychology," Dean J. E. Lough. 8:40, Amherst Musical Club Concert. 10:30, Beaux Arts orch.

WEAR, Cleveland, O., 390 (E. S. T.)—7 P. M., Austin J. Wylie and his orch.

WMC, Memphis, Tenn., 500 (E. S. T.)—8:30 P. M., to be announced. 11, midnight frolic.

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, dinner music by A. Candelori and his orch. 8, Howard Strong, "Regional Highway Planning." 8:15, University of Pennsylvania. 9, Astor Coffee orch. 9:55, time. 10:02, weather. 10:03, organ recital, Mary E. Vogt. 10:30, Vincent Rizo and his orch.

Lopez Orchestra On Saturday

Saturday, February 28

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercise. 10:45, weather, business reports. 11:55, time. 12:15 P. M., Ahaus-Brunswick Orch. 1:30, business reports.

KGO, Oakland, Cal., 360 (P. S. T.)—11:30 A. M., luncheon concert. 12:30 P. M., final reading, stock reports and weather. 4, concert orch. 8, San Jose School Band; guest artists. 10, Henry Halstead's Orch.

KOA, Denver, Colo., 323 (M. S. T.)—12 M., organ recital. 1 P. M., final reading, N. Y. stock reports, live stock and weather. 9, Joe Mann and his Rainbow-Lane Orch.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 10 P. M., Colburn's Melody Men.

WDAF, Kansas City, Mo., 366 (C. S. T.)—3:30 P. M., Radio Orch. 5:50, marketgrams, weather, time and roads. 6, address, personal message from Roger W. Babson; Tell-Me-a-Story Lady; the Trioan Ensemble. 11:45, Nighthawk Frolic.

WWJ, Detroit, 353 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "to-night's dinner" and a special talk. 9:45, Public Health Service bulletin. 10:25, weather. 11:55, time. 12:05 P. M., Jules Klein's Hotel Statler Orch. 3, News Orch. 3:50, weather. 3:55, markets. 8:30, concert from the Detroit Athletic Club.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeezix time for children. 5:57, time.

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercises. 10:45, weather, business reports. 11:55, time. 1:30 P. M., market reports. 3, Marco Melody Boys; Fred Lindemann, director and manager. 6, Selinsky Instrumental Quintet.

WRC, Washington, D. C., 469 (E. S. T.)—6:45 P. M., children's hour by Madge Tucker. 7, dinner music by the Boernstein orch. 8, Bible talk. 8:15, Earl Carbauh, baritone. 9, Evelyn Scott, violinist; Eugene Stuart, accompanist. 10:30, Joseph Knecht's Waldorf-Astoria orch. 11:15, organ recital by Otto Beck.

WPG, Atlantic City, 300 (E. S. T.)—9 P. M., studio recital. 10, studio concert by Galen Hall Striving trio.

KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—9:45 A. M., stockman reports. 11:55, time. 12, weather; stockman reports. 1:30 P. M., Daugherty's orch. 6, Westinghouse band. 7:30, Richard, the Riddler. 7:45, last minute helps to Bible School Teachers. 8:30, Westinghouse band. 9:55, time; weather.

WGY, Schenectady, N. Y., 380 (E. S. T.)—9:30 P. M., dance music by Romano's orch.

WIP, Philadelphia, Pa., 509 (E. S. T.)—1 P. M., organ recital by Karl Bonawitz. 1:30, weather. 3, popular program by the Colonial dance orch. 6, weather. 6:05, dinner music by Charles Masters and his orch. 6:45, livestock and produce market reports. 7, Uncle Wip's bedtime story and roll call. 8, Scout talk by Noah Swain. 8:15, an evening with the De Molay Boys. 9, Lenten talk. 9:15, the De Molay Boys, program continued. 10:05, dance music by the Benjamin Franklin Hotel. 11:05, organ recital by Karl Bonawitz.

WGBS, New York City, 316 (E. S. T.)—10 A. M., timely talks with Terese. 10:10, Eleanor Schorer and her Kiddie Klub. 10:40, Georgette, fashion talks. 10:50, Betty Reich, candy expert. 1:30 P. M., scripture reading. 1:35, Blue Horse Instrumental quartet. 3, interview with Nathalia Crane. 3:10, Doris Freemorgan, soprano. 3:20, Lady Edison, invention talk. 3:30, Doris Freemorgan, soprano. 3:40, Helen Rowland, "Sayings of Mrs. Solomon." 3:50, Doris Freemorgan, soprano. 6, Uncle Geebee. 6:30, Jack Wheaton's orch. 8:30, Bob Emmerich, radio's favorite pianist. 9, "Safety First in Driving," by Rhineland Waldo; "Motor Camping," by Major Percival. 9:30, Sam Comly, "Inside Movie Chats." 9:45, Robertina Robertson, contralto; Samuel Polonski, violinist, and Lewis Shuggerman, pianist. 10:45, music. 11, Paoli Del Pino, tenor.

WEAF, New York City, 492 (E. S. T.)—4 P. M., Eugene Ingraham's orch. 6, dinner music; Anna Hutter, soprano; Joseph Martin, boy soprano; adventure stories for boys by Fred J. Turner; Michael Markel's Society orch.; Knickerbocker Male quartet; Waldorf-Astoria Concert orch.; Marguerite Fales, contralto; Leslie Joy, baritone; Vincent Lopez and his orch.

WJZ, New York City, 455 (E. S. T.)—1 P. M., Erdody's Park Lane orch. 4:30, Sherry's tea orch. 5:30, State and Federal reports. 7, Freddie Rich and orch. 8, "Art for Laymen." Walter M. Grant. 8:15, American Orchestral Concert. 8:45, "British Journalism," George Laval Chesterton. 10, Erna Korn, contralto; Keith McLeod, accompanist. 10:30, Joseph Knecht's.

KYW, Chicago, 536 (C. S. T.)—6:30 A. M., morning exercises. 9:30, late news and comments. 10:30, farm and home service. 11:35, table talk by Mrs. Anna J. Peterson. 6:02 P. M., news, financial and commercial 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, program, direc-



MEET Miss Eleanor Freemantel, accompanist at WCCO, at Milwaukee, Wis. Peculiar though it may seem, Miss Freemantel flatly refuses to play solos. She says: "It's all right when I'm playing for others, for I feel that all I have to do is to help them along. I know I would become panicky if I played alone."

tion of Henry B. Roney. 9:05, Youth's Companion. 9:35, "Congress Classic." 12, "Congress Carnival." 1, "Insomnia Club."

WMC, Memphis, Tenn., 500 (E. S. T.)—8:30 P. M., program by J. M. Gates.

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, organ and trumpets. 9:55, time. 10:02, weather.

Sunday, March 1

WLW, Cincinnati, O., 423 (C. S. T.)—9:30 A. M., school conducted. 11, services; soprano, Charlotte Sandman Angert; contralto, Louise Koetter; tenor, Erwin Meyer; base, Edwin Weidinger. 7:30, services. 8:30, concert by the Western and Southern orch.; soloist, Joseph Vito.

KGO, Oakland, Cal., 312 (P. S. T.)—11 A. M., services. 3:30, KGO Little Symphony orch. 7:30, services.

WIP, Philadelphia, 509 (E. S. T.)—10:45 A. M., morning service. 4 P. M., "The Radio Mind of God," a lecture by William Forkell.

WMAK, Lockport, N. Y., 265 (E. S. T.)—10 A. M., church service.

KFI, Los Angeles, 467 (P. S. T.)—10 A. M., L. A. Church service. 11, church services. 4 P. M., Vesper services. 6:45, KFI radiatorial. 7, theatre program. 8, Lenten service. 9, Examiner program. 10, Theron Bennett and his Anhelos orch.

WOAW, Omaha, Nebr., 526 (C. S. T.)—9 A. M., radio chapel service. 1:30 P. M., matinee program. 2:30, matinee program. 6, Bible study period. 9, musical chapel service by the Calvary Baptist church.

WHAS, Louisville, Ky., 400 (C. S. T.)—9:57 A. M., organ music. 10, church service. 4 P. M., organ recital by George Latimer. 4:30, choral evensong service.

KOA, Denver, Colo., 323 (M. S. T.)—11 A. M., service. 7:45 P. M., service.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—10:45 A. M., services. 3 P. M., People's Radio church. 4, piano recital by Prof. Otto Kalteis. 6:30, dinner concert. 7:30, "Roxy" and his gang.

WDAF, Kansas City, Mo., 365 (C. S. T.)—4 P. M., classical music. 5, International Sunday school lesson. Dr. Walter L. Wilson.

KGW, Portland, Ore., 492 (P. S. T.)—10:30 A. M., services. 3 P. M., municipal concert. 6, church services. 7, dinner concert by Colburn concert orch.

WOO, Philadelphia, 510 (E. S. T.)—10:30 A. M., morning church services. 2:30 P. M., musical exercises. 6, old-time hymns and melodies.

Monday, March 2

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting up exercises. 10:45, weather. 11:55, time. 12:15 P. M., noonday service. 1:30, business reports. 3, market reports. 4, Babson reports. 6, Selinsky Instrumental Quintet. 8, Star program; "Sinfonia" Male Quartet; Howard Hafford, tenor; Kathryn Reicin Haunt, soprano; flute obligatos by Ewald Haun; Henry Lange and his orch.

WMAK, Lockport, N. Y., 265 (E. S. T.)—8 P. M., musical. Al Utsinger's orch.

KGO, Oakland, Cal., 312 (P. S. T.)—9 A. M., music and lectures by the California Department of Education. 10:40, classroom instruction by Oakland public schools. 11:30, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports; weather. 3, musical program and speaker. 4, Henry Halstead's dance orch. 5:30, Aunt Betty stories. 6:45, stock reports; weather; S. F. produce news and news. 8, educational program. 10, Henry Halstead's orch.

KFI, Los Angeles, 467 (P. S. T.)—5 P. M., Herald News. 5:30, Examiner News. 7, Herald program. 8, Coso Indian orch. and Indian baritone. 9, classic program. 10, Examiner program.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., selections from Louisville Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain market. 5, time.

WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M., musical program. 6:30, Vesper recital. 8:30, Dallas band. Paul E. Ashley directing.

2 P. M., Billy Gavin and his orch. 4, George and his White Way orch. 6:30, Big Brother Club. 7:15, sport talk by Stanley Woodward. 7:25, Dok-Eisenbourg and his Sinfonians. 7:55, Pathe News flashes. 8, Lansing Mandolin Club. 8:30, Cuff Brothers. 8:45, Francis C. Chantreau, tenor. 9, A. & P. Gypsies.

KOA, Denver, Colo., 323 (M. S. T.)—12:20 P. M., rialto organ recital. 1, N. Y. stock reports, live stock, fruit and vegetable report and weather. 6, final reading, N. Y. stock reports. 8, ten minutes of music. 8:10, studio program; three-act comedy, "Come Out of the Kitchen," by the KOA players.

WOAW, Omaha, Nebr., 526 (C. S. T.)—5:45 P. M., public news period. 6, organ music. 6:30, Stanley Jan Letovsky, composer-pianist. 9, program under auspices of Matsuo Studio. 10:30, Hospe's Royal Serenaders.

WLIT, Philadelphia, 395 (E. S. T.)—11:45 A. M., daily almanac. 10:02 P. M., organ recital; Arcadia cafe concert orch. 2, 2d recital by the Arcadia cafe concert orch. 4:30, artist recital. 5, continuing the educational talks. 7:30, "Dream Daddy." 7:50, "Short Agro-Waves," practical hints and seasonal news for farm folks. 8:05, Monday evening recital by the concert orch. 9:30, broadcast of vocal and dramatic features. 10:02, dance program by the Arcadia dance orch.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M., news; weather. 4:30, stock market; The Sunshine Girl. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, special feature. 8:30, recital by Edward L. Marsh, tenor soloist. 9, A. & P. Gypsy String Ensemble. 11, flight of the mythical dirigible.

WDAF, Kansas City, Mo., 365 (C. S. T.)—3:30 P. M., program from theatre. 5, weekly Scout program. 5:50, marketgram, weather. 6, weekly "request story night"; Trioan Ensemble. 8, "Around the Town." 11:45, nighthawk frolic.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeezix time for children. 5:57, time.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio. 5, children's program. 7:15, markets, weather, news bulletins and police reports.

Tuesday, March 3

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting up exercises. 10:45, weather; business reports. 11:55, time. 12:15 P. M., program by the Delta Omicron Sorority. 1:30, business reports. 3, market reports. 4, recital; lecture, "Mah Jongg." 6, Selinsky Instrumental Quintet. 10, program from St. Mary's, Ohio.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., KGO 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, program by the KGO Little Symphony orch. 10, Henry Halstead's orch.

KFI, Los Angeles, 467 (P. S. T.)—5 P. M., Herald News. 5:30, Examiner News. 6:45, KFI radiatorial. 7, dinner orch; Starr Russell, soloist. 8, Examiner program. 9, classic instrumental and vocal program. 10, Packard ballad hour; trio; Packard Melody Girls; Jeanette Dace, pianist.

WEEL, Boston, 303 (E. S. T.)—1 P. M., Civitan Club. 2, Paul Davier and orch. 6:30, Big Brother Club; Uke Band. 7:15, sport talk by Wm. E. Mullins. 7:25, Dok-Eisenbourg and his Sinfonians. 8, New York program, musical. 8:30, Gold Dust Twins. 9, Eveready hour. 10, Goodrich orch.

WOAW, Omaha, Nebr., 526 (C. S. T.)—12:30 P. M., Horticultural program. 5:45, public news period. 6, "Advice to Lovelorn." 6:25, dinner program. 9, Blackstonian orch. 10:30, Frank W. Hodek, Jr., and his Nightingale orch.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., selections from Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain market. 5, time. 7:30, concert by Carl Zoeller's Melodists; a chapter of the "Billy and Jane" stories; late news; time.

KOA, Denver, Colo., 323 (M. S. T.)—12:20 P. M., Rialto organ recital. 1, N. Y. stock reports; live stock, fruit and vegetable report and

(Continued on page 28)

A THOUGHT FOR THE WEEK

RADIO shows may come and go in the armories and elsewhere, but there's a show every night when pop wants son to give up the earphones, when mom has graduated from the kitchen to her moments of ease and simply MUST get that station she couldn't get last night.

RADIO WORLD



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FEBRUARY 28, 1925

Asking Too Much



JIM—The 1-tube set I built gets the Pacific Coast on a loop, from my home in New York.

TIM—Build me one.

JIM—Sorry, but I'm too busy improving the circuit.

Self-Charging Battery Acids a Fake, Says Standards Bureau

WASHINGTON

THE Bureau of Standards has issued a warning to radio fans to guard against certain solutions which are said to charge batteries instantly or in a short time as compared with the usual process.

An investigation has been made by the Bureau which revealed that changing the solution in a storage battery does not charge it. The tests showed that batteries containing these solutions, contrary to the claims made for them, behave in accordance with well established laws of electro-chemistry.

"Analysis revealed these solutions to contain 38 to 42 per cent of sulphuric acid," says the Bureau of Standards warning, "which is about the amount in the ordinary electrolyte of an automobile battery when charged. In some of them were found also significant amounts of sodium or magnesium as well as coloring matter. The sodium may have been added as soda, lye, or Glauber salts; the magnesium as Epsom salts. The use of sodium sulphate in batteries is an old story. It was suggested more than 35 years ago, but various authorities since that time have stated that such material is without beneficial effect. This has been confirmed by the Bureau's recent experiments which show the rate of sulphation of plates to be unaffected by even 4 to 5 per cent of Epsom salts or Glauber salts.

Canard is Squelched

"Comparison was made between batteries containing these solutions and similar batteries containing electrolyte or sulphuric acid of equivalent strength. No essential differences were shown in the charging, the voltage, the efficiency or the temperature. When a battery is said to be charged it is understood that the battery is fully charged. A battery that is almost completely discharged may have nearly the same voltage as one that is charged. In this condition it may be able to operate the starter of an automobile, but this fact can not be taken as evidence that the battery is fully charged. It takes as long to fully charge a battery containing one of these solutions as to charge a similar battery containing the ordinary electrolyte.

"The indiscriminate addition of these solutions to a battery is not advisable, although in some cases no great harm may be done. If the solution is used to replace the electrolyte of a completely discharged battery as is usually the case, the battery may be spurred on to give a little more current because the plates retain a surplus of active material. When the battery is recharged by an electric current the specific gravity will rise much too high. This is because formed at the plates by the charging current is added to the acid already present in the solution. In the Bureau's experiments it rose to 1.365.

What the Effect Is

"This is not desirable because the local action or self discharge within the battery is materially increased. A battery containing one of these solutions lost 47 per cent of its charge in four weeks as compared with 8 per cent which was lost by a similar battery with the ordinary solution.

"Batteries containing solutions of higher than normal specific gravity give less capacity at high rates of discharge, as when cranking the engine of an automobile, depending upon the behavior or the negative

Bureau Hears From Denouncers of Announcers

WASHINGTON.

ACCORDING to reports received by the Radio Bureau the announcers of some of the broadcasting stations continue programs for long periods without announcing the call letters of the stations and as some of the call letters are not readily understood, suggestion has been made that some other method be adopted which will make identification more positive.

It will probably be helpful if when making an announcement the call letters of a station are followed by the name of the city in which the broadcasting station is situated and would no doubt be appreciated by the audience if the announcers would announce distinctly the call letters and name of the city at somewhat regular intervals.

plates. The higher the specific gravity of the electrolyte the more injurious is the action upon the separators. It is a well recognized principle in battery operation that acid should be added only to replace that which may have been spilled, or in rare instances to adjust the specific gravity to the required standard after the completion of full charge.

"Although the materials and coloring matter considered individually may be harmless, the disadvantages in using such solutions more than offset any temporary gain. The usual electrolyte of pure sulphuric acid and water, adjusted to the proper specific gravity at the completion of a full charge, is believed to be the best."

RADIO ON ITALIAN ROADS

ROME.

SOME interesting experiments with wireless telephone on Italian railways have just been completed. The experiments were under the direction of the Ministry of Communications on a moving train between Rome and Naples. The aerials comprised six horizontal wires arranged on the roof of the car at a distance of about 30 centimeters above its highest part. The central portion of the wires was connected with a receiving set in the interior of the car, the grounding being obtained by connecting the latter with the trucks of the car. When so equipped, the car in question was attached to the Rome-Naples train and messages were sent every half hour during the trip to Naples and the return trip the following morning. Messages were received clearly at a distance of from 150 to 200 kilometers. A short wave of 425 meters was used. When in tunnels, reception was impossible and when running in a cut the sound was somewhat weakened. However, under normal conditions, it is claimed, messages were received clearly. New studies are being made with a view of utilizing this new means of communication in a practical way.

RESISTANCE SET

(Concluded from page 7)

is not enough it is very easy to add another battery. The four tubes required are of the UV201A or C301A type. Attempts to use dry cell types of tubes only prove fruitless. It is well to change tubes around in the sockets until the best combination is found. Some tubes work better than others for amplifiers.

This 4-tube receiver will certainly satisfy the DX hound, as it will bring in everything within normal reach. It will pull in DX stations with a clear-cut tone, without distortion, unless the transmitter is distorting. I often stations 1,000 miles away on the speaker, and very clearly, too.

One of the remarkable things about the set was that it did not appear noisy on DX.

LIST OF PARTS

- One Radio Engineering Lab. (Lopez) 3-circuit tuning coil (L1L2L3).
- One Car-well .005 mfd. variable condenser (C).
- One 2-megohm grid leak (R1).
- One .00025 mfd. grid condenser (C1).
- One 10-ohm rheostat (R8).
- Three 45-volt B batteries.
- One 6-volt storage A battery.
- One .002 mfd. fixed condenser (C2).
- One Daven 3-stage resistance amplifier unit.
- Two 3" dials, plain.
- One 3" dial, vernier (for condenser).
- Two dial pointers.
- One 7x18" panel.
- One 6½x17" baseboard.
- One socket.
- One single-circuit jack.
- Three UV201A tubes.
- 100 feet of aerial wire, 50 feet No. 14 insulated lead-in wire, solder, lugs, hardware.

Clara Morris Enjoys Radio Set Gift

ADA PATTERSON, noted author and special writer for the New York Star and other periodicals, wrote a letter to RADIO WORLD, published a few weeks ago, asking: "Can't some plan be worked out whereby a set would be installed beside Clara Morris' sick-bed? She has an active mind and she sure looked wistful when I said: 'I'm sure you would enjoy a radio set.'"

Clara Morris, noted actress of a gen-

eration ago, now passes the erstwhile monotonous hours with a radio.

S. L. Rothafel (Roxy), of the Capital Theatre, New York City, learning of Miss Morris' plight and her yearning for a set, immediately promised that a set would be installed without delay.

However, there was another big-hearted man in New York City who just edged out Roxy. He was William Quade, manager of Proctor's Fifth Avenue Theatre. After ordering the set for Miss Morris,

Roxy learned that Mr. Quade's gift had been installed, so instead transferred his gift to Nellie Revell, also a well-known author and who has been ill for years. Miss Revell, who has many theatrical friends, is able to get about quite happily now.

Miss Morris will be seventy-nine on March 17.

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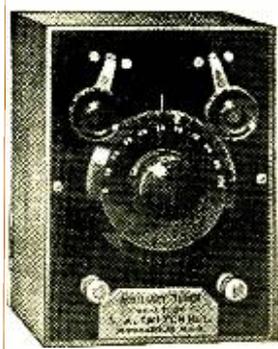
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WHAT Results Did You Obtain from Constructing Sets or Parts Following Data Published in RADIO WORLD? Write to Results Editor, RADIO WORLD, 1493 Broadway, New York City.

RESULTS EDITOR:

WITH this letter I have kept at least one New Year resolution, namely, to express any appreciation of the 3-tube DX Superdyne (Dec. 27). I like it better than my 4-tube on account of its remarkable DX and the clearness of the tone. On the first evening I tuned in WOC on the loud speaker as well as WGY and other stations. When I heard McCormack and Bori sing I knew I owed you this note and more besides.

W. L. FOSTER.

228 E. Thirty-first St., Brooklyn, N. Y.

RESULTS EDITOR:

I HAVE been buying your magazine for the past year and have been following your hookups very closely. I built RADIO WORLD's 3-tube DX Superdyne, described by Herman Bernard in the December 27 issue.

I used the Thurman coil and am operating three UV199 tubes, Scientific .0005 variable condenser and Continental .0005 variable in connection with radio-frequency coil of 32 turns.

I found that this hookup is one of the best that I have built, and I have built many sets.

It has been a great improvement in the direction of improved reception. I hope that Mr. Bernard will keep up his good work.

P. CASSIDY,
928 Lawrence St.,
Camden, N. J.

RESULTS EDITOR:

I AM now a subscriber to your wonderful magazine and I want to tell you of the success I have had with your Superdyne circuit.

By using a Sodian tube I get an im-

provement over the 200 or 201A tubes as a detector, and oscillation is more easily controlled. A little change in the wiring of detector circuit, according to the diagram accompanying the Sodian tube, will give better results. I am a Superdyne booster. It cannot be beat.

To date I have logged 123 stations, besides several amateur stations.

R. L. MIMS, JR.

Lenoir City, Tenn.

RESULTS EDITOR:

I BUILT the 1-tube DX Dandy set described in the issue of Oct. 4 and it is the best 1-tube set I have built. Results: The first night PWX, Havana, Cuba. Since then WFAA, Dallas, Tex.; WOAW, Omaha, Neb.; WSB, Atlanta, and practically everything in between. No amplification used. Accept my warm thanks.

J. O. WINTERSTEEN.

412 No. Apple St., Dunmore, Pa.

RESULTS EDITOR:

I BUILT the 1-tube DX set described by Herbert F. Hayden (Oct. 4) and find it a wonder. Using the set as it is I have heard practically every 500-watt station from Fort Worth, Texas, back to the Atlantic coast.

I have also built the 1-tube circuit described by Lt. P. V. O'Rourke in issue of Dec. 6 and the 1-tube DX Superdyne described by Herman Bernard in issue of Dec. 20. Had fine success with both circuits.

I am a regular reader of RADIO WORLD. I get lots of pleasure and information from it, and I am always trying out the circuits published in it.

J. R. FREEMAN.

Care Brockman Poultry Farm, Greer, S. C.

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 Neuts to this. Only extra part, 22 feet real gold-headed bus wire. Photographed 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.

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Dealers write for big sales proposition

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VARIABLE; HAND CALIBRATED
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"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 carphones 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.

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FILL OUT AND MAIL

Great Wonder That Radio Works At All, Says Noted Engineer

Horle Acknowledges Feat of Scientists and Sees Great Strides Ahead—Better Reception at Night Explained—Fans Ask a Great Deal, Says Federal Co. Expert.

By Lawrence C. F. Horle
Chief Engineer, Federal Telephone Mfg. Co.

THE greatest wonder of radio is that it works at all, and the more I think of the inherent limitations from which it suffers, the greater becomes my wonder at the ever-increasing importance which it is assuming in national life today. When one remembers that in radio we are using a natural medium, the ether, for this type of communication, and that the characteristics of this something are quite beyond our control and vary terrifically from instant to instant, unless one knows that communication through it has already found a useful place in human endeavor one would be almost willing to say that it would never be possible.

Those who own and operate radio sets know only too well what the effect of variations in this medium is. When it is borne in mind that every electrical disturbance in the ether, be it of natural or man-made origin, limits the entertainment which can be obtained from radio, it must of necessity be concluded that radio is

doing more than could rationally be expected from it.

The Ionization of the Air

There are several interesting phases of this interference by static and other causes. We have always had evidence that the presence of daylight in the air brought about a reduction in the capacity of that air for the transmission of radio waves. This peculiar and unfortunate condition has been explained as an ionization phenomenon, namely, the conversion of the air, which is normally a perfectly satisfactory insulating medium, and hence ineffective upon the transmission of radio through it, to a partly conducting medium, the natural tendency of which

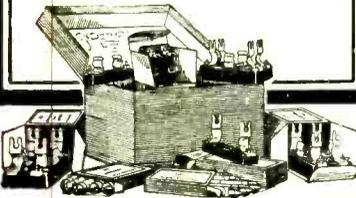
would be, of course, to sadly limit, if not completely wipe out, any disseminating energy of the radio type passing through it. That this is fact is more strongly than ever indicated by the results of the recent eclipse tests when it was found that the

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A Jewelry product which beautifies your set.
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A Glimpse Into Radio's Future

energy from WGR intercepted in Ithaca at Cornell increased three-fold during the few minutes of totality. This same phenomenon must be looked forward to as being a constant handicap on the trans-

Radioists Should Be Ready to Pay More for Sets, Thus to Enjoy Those Conditions Which, as at Broadcasting Stations, Approach Perfection, Says Horle.

mission of radio throughout the daylight. Insofar, as we know, or expect, no method for the elimination of these limitations can, with reason, be looked forward to.

When your receiver is adjusted for the interception of signals several thousand miles away it is equally well adjusted for the interception of natural electrical disturbances at least that far away, so you obtain satisfactory entertainment only when such electrical disturbances as lightning storms, etc., within that number of miles are less than the entertainment signal value which you want.

Every electric light line every telephone line every overhead conductor is a potential radiator of interfering signals and only when the desired signal is stronger than are the interfering signals do you begin to get entertainment via radio.

Fortunately however all these limiting phenomena are for the major portion of the time of lesser intensity than are radio signals and so you find yourself for the most part receiving satisfactory entertainment.

There is another phase of the handicap under which the radio receiver of today labors that perhaps does not occur to you. If you will bear in mind the fact that the radio art is now still less than thirty years old and that it must of necessity, still be one in which great strides in the way of development can yet take place, we may well understand why the definite price limitations which are put on apparatus if it is to be sold commercially at a profit tends seriously to limit the degree of perfection of performance which can be realized in its operation. Let me point out that while those of us who have bought radio sets have refused to pay more than a few hundred dollars for that equipment complete, we find in broadcasting, where a closer realization of perfection is sought almost regardless of cost, it has been necessary to expend thousands of dollars to accomplish the same general type of thing as is accomplished in the receiving set, but with the requirement that its capacity for music reproduction be perfection itself.

Then, too, the fact that the radio en-

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Complete Postpaid

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MORE SELECTIVITY
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Than you have ever been able to buy for \$48.50. Complete in every detail even to panel and cabinet, contains Lopez famous Low Loss Tuner, Heath "Radiant" Low Loss Condenser, Superadio 2 in 1 and 3 in 1 Units, Etc., Etc.

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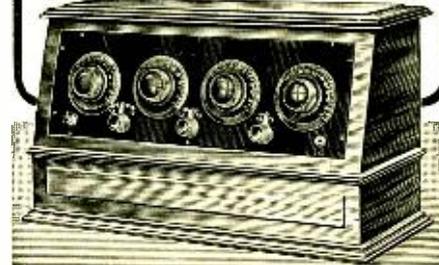


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Speakers Discussed by Expert

thusiast requires that his radio set make necessary little or no education in its operation and even less in its maintenance, makes it quite impossible to give that radio user the advantage of much of the vast amount of information and experience which has been gathered in the design of the so nearly perfect broadcasting transmitting equipment. He refuses to have more than two or three controls which require manipulation. He expects that these controls, once set, will serve for a wide range of reception and he expects also once his apparatus, installed and started into operation, must continue to operate almost independent of any care on his part; and then too the whole radio art is faced by a peculiar and almost inherent limitation; namely, that which

seems to associate itself with all sound reproducing apparatus.

The human ear is probably one of the most sensitive and carefully differentiating devices in existence. It allows you and me to perceive tonal values of far wider range in tone or frequency and intensity than is perceptible on any artificial ear, such as a telephone microphone, and the broadcaster is faced with the problem of making for himself such an artificial ear and using it under more widely varying conditions than the average ear would probably ever find itself. Then, too, the user of radio apparatus requires that he be given a sound reproducer in the form of a loudspeaker which has all the desirable characteristics of the sound producing equipment which we all carry concealed in our throats, and that this device never be subject to the colds and coughs that even the healthiest of us suffer from occasionally.

There are other limitations in this matter of sound reproduction which definitely handicap the designer and builder, but the important fact is that notwithstanding all these limitations we do get perfectly acceptable entertainment from our radio set and as time goes on the satisfactoriness of this entertainment grows more and more.

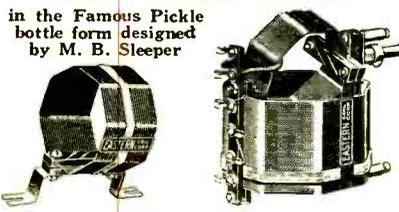
Sees Bright Future

From this rather darkly pictured arraignment of the handicaps from which radio suffers one might tend to become pessimistic as to its future, but the fact is that the last six years has seen so much rapid development and such tremendous strides toward perfection that even one closely associated with the industry and seeing the natural handicaps in far more prominent color than the greatness of the art, can't help but feel that in radio communication the world will see a degree of engineering perfection quite unequalled in any other art.

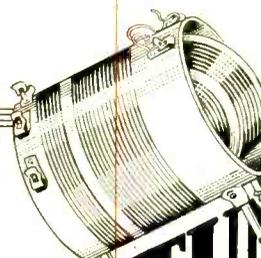
For the present I look forward to the solution of the static problem with considerable interest. I watch with much happy expectation the word of the many investigators who are now pointing their trained intelligences toward the solution of this problem. I see the results of the

millions of dollars which are being expended at this time for the devising of means for the more faithful reproduction of music. I see all this being brought into even the smallest homes in America and making this country a place of ever-increasing contentment and happiness.

LOW-LOSS COILS
in the Famous Pickle bottle form designed by M. B. Sleeper



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Guaranteed for best results in this wonder circuit
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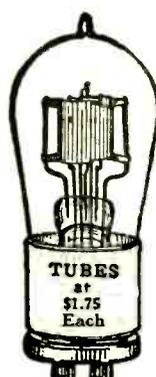
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1219 So. Wabash Ave., Dept. 82, Chicago, Ill.
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All equipped with Solid Rubber Base.

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SAVE \$1.25

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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
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THE Summit TOROIDAL RADIO FREQUENCY TRANSFORMER

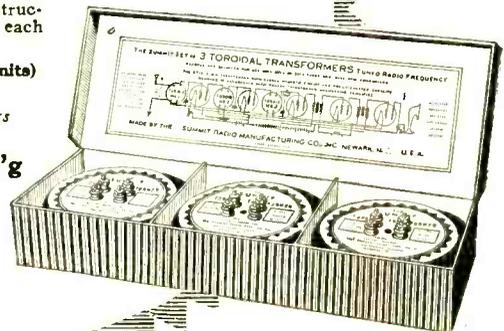
USED in exactly the same manner as the open radio frequency coils—they are self balanced and self neutralized. They have no stray fields nor leakages, nor can they feed back, thus assuring the radio set builder of correct operation without howling or squealing.

One builder using these Transformers in the SUMMIT circuit received 54 stations in two nights, traveling West to Denver and South to Mexico City. This circuit with instructions for building enclosed with each set of Transformers.

List Price (Set of 3 mated units) **\$10.00**

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Reg. U. S. Pat. Off.

Grimes Inverse Duplex System

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

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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 RADIO PRIMER

(Concluded from page 10)

to operate on a 22½-volt B battery that has a voltage reading below 14, or below 37 on a 45-volt battery.

For dry cell tubes, the same precaution should be exercised. A dry-cell that has a current reading of below 16 amperes should be junked.

The specific gravity reading for a fully charged storage A battery will be between 1275 and 1300, according to the make of the battery.

A storage battery can stand only so many discharges before you will be compelled to bring it to the shop for overhauling. Almost all storage batteries will give you years of faithful service if you give them just a little attention. Keep the plates covered with distilled water. Keep the battery away from heat. Never allow it to freeze. Do not wait for the battery to become fully discharged before you recharge it. You will find it more economical if you recharge it at given periods, whether it seems to require it or not. Never charge the battery with the caps on.

WALSH ASSAILED IN COURT FOR OIL CASE TALK OVER RADIO

WASHINGTON.

THE action of Senator Thomas F. Walsh of Montana, prosecutor in the Senate oil investigation, in discussing the Government oil cases over the radio on May 6, 1924, at the time they were under consideration by a Federal Grand Jury, was again made the object of attack in Criminal Court No. 2. Argument was resumed on the pleas for abatement of the indictments returned against Albert B. Fall, Edward L. Doheny Sr., Edward L. Doheny Jr. and Harry F. Sinclair.

It was the contention of counsel for the four, who were indicted on a charge of conspiring to defraud the Government of valuable oil lands, that the effect of Senator Walsh's radio speech was to prejudice the public mind, and possibly the jury, and thereby cause injury to the defendants. The defense also alleges that certain persons were illegally admitted to the Grand Jury room. The argument is being heard by Chief Justice McCoy.

Clear-O-Dyne

Four and Five Tube Sets

No set of an equal number of tubes will do more, yet the price is very moderate.

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COMMERCIAL TYPE RADIO APPARATUS, by M. B. Sleeper. Mailed on receipt of 75c. The Columbia Print, 1493 Broadway, N. Y. C.

A \$5 HOME-MADE LOUDSPEAKER, by Herbert E. Hayden, in Feb. 7 issue. Send 15c for copy. RADIO WORLD, 1493 Broadway, 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 Broadway, N. Y.

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"A 6-TUBE SUPER-HETERODYNE," by J. E. Anderson. Variometer tunes aerial. How to make all coils, including intermediate frequency transformers. Send 15 cents for December 6 issue to RADIO WORLD, 1493 Broadway, New York City, or start your subscription with that number.

LOUDSPEAKER ON TWO TUBES accomplished by the Bluebird Reflex, described by Lieut. Peter V. O'Rourke in the Feb. 7 issue of RADIO WORLD. Picture diagram, also schematic diagram, panel and assembly plans. An inexpensive set to make and operate. One stage of tuned RF, crystal detector, one reflexed audio stage and one free audio stage. Selective and good for DX. Send 15c for a copy or start your subscription with the February 7 issue. RADIO WORLD, 1493 Broadway, New York City.

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.

"A SELECTIVE 2-TUBE SUPERDYNE," by Herman Bernard, November 29 issue. Two RF and crystal detector, for fine quality and about 500 miles' reception. Send 15 cents for copy. RADIO WORLD, 1493 Broadway, New York City.

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New Patents

WASHINGTON.

PATENTS on eight new radio inventions were granted by the U. S. Patent Office during the past week. A brief description of these new inventions follows:

DIRECT Reading Radio Telegraphic Compass (No. 1,525,177), invented by Robert B. Goldschmidt and Raymond Brillard, of Paris, France. Enables the measurement of radio signals.

CRYSTAL DETECTOR (No. 1,525,159), invented by Henry M. Wohlman and Max Hirschfeld, of Brooklyn, N. Y. Permits the replacement of old crystals with new ones.

REMOTELY Controlled Selective System (No. 1,525,431), invented by Thomas H. Phillips, Jr., of Brooklyn, N. Y., and assigned to Elmer A. Sperry, of Brooklyn. Relates to the selective control of translating devices from a distance by

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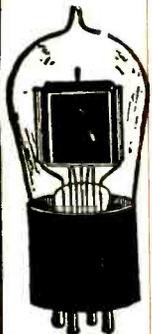
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WASHINGTON.

SUPERVISOR OF RADIO W. D. STERRELL and **Commissioner of Navigation D. B. Carson** went to Cincinnati where they will attempt to settle the broadcasting war between stations **WLW** and **WMH**. On different nights during a given week these two stations have operated simultaneously on the same wavelength.

means of a minimum number of line wires or by radiant energy.

ELECTRON-DISCHARGE TUBE (No. 1,525,049), invented by Samuel Ruben, of New York, N. Y. Provides an efficient low cost means for detecting and amplifying received radio-frequency oscillations.

VARIOCOUPLER (No. 1,524,976), invented by Charles W. Kautz, of Lancaster, Pa. Provides means by which the inductance of the primary winding may be varied without the necessity of mounting contact studs upon a panel board.

VACUUM SPARK GAP (No. 1,525,350), invented by Harry Zuckerman, of New York, N. Y. Makes provision for more scientifically maintaining the adjustment of spark gap; to more thoroughly provide for the installation of the device as a part of a wireless system.

METHOD and Apparatus for Electrically Operating Tuning Forks (No. 1,524,868), invented by Lloyd M. Knoll, of Philadelphia, Pa. Provides a means of securing constancy of frequency when minute time intervals of precise duration are desired for precision measurements and other purposes.

AUDIO-FREQUENCY Selective Signaling System (No. 1,525,110), invented by Frederick K. Vreeland, of Montclair, N. J. Provides for increased efficiency in apparatus adapted to the elimination of strays of sudden impulsive character. (Copyright, 1925)

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Inaugural On Air Wednesday Programs

(Tuesday March 3, continued from page 19)
 weather. 3, half hour matinee for housewives. 6, dinner music. 6:30, final reading, N. Y. stock reports, live stock, vegetables and late news.

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WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M., news; weather. 4:30, stock market; The Sunshine Girl. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, special feature. 8, program from New York. 8:30, the "Gold Dust Twins." 9, "The Eveready Hour." 10, Goodrich Silvertown.
WLIT, Philadelphia, 395 (E. S. T.)—11 A. M., special morning organ recital. 11:45, daily almanac. 12:02 P. M., continuing the organ recital. 2, recital from concert orch. 4:30, weekly talk for women. 7:30, "Dream Daddy." 7:50, "Both Sides of the Footlights," a weekly chat on the theatre.
WMC, Memphis, Tenn., 500 (E. S. T.)—8 P. M., lecture by Charles Howard Plattenburg. 11, frolic by Reinhardt's Symphony orch.
WDAF, Kansas City, Mo., 365 (C. S. T.)—3:30 P. M., The Star's radio trio. 5, weekly child talent program. 5:50, marketgram, weather, time and road. 6, piano tuning in number; Tell-Me-a-Story Lady; radio piano lesson, Maudellen Littlefield; music, Trianon ensemble. 11:45, Nighthawk Frolic.
KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio. 5, children's program. 7:15, markets, weather, news bulletins and police reports. 8, agricultural service lecture. 8:30, concert arranged by Mrs. Fred L. Olson. 10, Multnomah Hotel Strollers.
WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeeze time for children. 5:57, time.

Wednesday, March 4

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercises. 10:45, weather and business reports. 12:30 P. M., Coolidge inaugural. 1:30, business reports. 3, market reports. 4, program for the "Shut-Ins." 6, Selinsky instrumental quintet. 8, trio, William Stoess, violin; Arthur L. Knecht, cello; Rosemary Ellerbrook, piano and celeste; Clifford Lang. 8:30, five-minute talk on "National Thrift." 9, Walter Esberger, pianist, and instrumental quartet; selections from light operas; songs by the famous Lyric male quartet.
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 and speaker. 4, concert orch. 6:45, final reading, stock reports, weather, S. F. produce news, and news.
KFI, Los Angeles, 467 (P. S. T.)—5 P. M., Evening Herald news. 5:30, Examiner news. 6:45, KFI radiatorial. 7, Nick Harris detective stories. 7:30, a popular program. 8, Herald program. 9, Examiner program. 10, dance orch.; Betty Patrick, soloist.
WFAA, Dallas, Texas, 476 (C. S. T.)—12:30 P. M., Charles E. Osborn, health talk; music. 6:30, Vesper recital. 8:30, musical recital by Edmund

Boettcher, tenor; William H. McRaven, pianist. 11, organ recital, Dwight Brown.
KOA, Denver, Colo., 323 (M. S. T.)—12:20 to 12:50 P. M., Rialto (theatre) organ recital. 1, N. Y. stock reports; live stock, fruit, vegetable, and weather. 6, final reading, N. Y. stock reports, live stock, vegetables, and late news. 8, ten

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Programs

(Continued from preceding page)

minutes of music by Fred Schmitt and his Rialto orch.

WEEI, Boston, 303 (E. S. T.)—12 M., Inauguration of President Coolidge. 2, musical. 6:30, Big Brother Club. 7:15, sport talk by Stanley Woodward. 7:30, radio interview. 7:45, Harry Einstein. 8, The Traveler Shoe orch. 8:30, M. B. Cohan's half hour musical. 9, Gillette orch.

WHAS, Louisville, Ky., 400 (C. S. T.)—1 P. M., selections from Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain markets. 5, time. 7:30, concert by the Tropical Hawaiian sextette; a chapter of the "Billy and Jane" stories; late news; time.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12 P. M., Inauguration ceremonies of President Calvia Coolidge. 1:30 P. M., news; weather; reading of program for the day. 4:30, stock market reports; The Sunshine Girl. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, special feature. 8:30, concert by the Keystone male chorus.

WDAF, Kansas City, Mo., 365 (C. S. T.)—broadcasting of Inaugural ceremony. 3:30 P. M., The Star's radio trio. 5:50, marketgram, weather,

time and road. 6, address from the Meat Council; The Tell-Me-a-Story Lady; Trionan ensemble. 8, program of classical music.

WLIT, Philadelphia, 395 (E. S. T.)—11:45 A. M., daily almanac. 12:02 P. M., organ recital from the Stanley theatre.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeeze time for children. 5:57, time.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio. 5, children's program. 7:15, markets, weather, news bulletins, and police reports. 8, concert. 10, Colburn's Melody Men.

Thursday, March 5

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercises. 10:45, weather, business reports. 11:55, time. 12:15 P. M., noonday concert. 1:30, business reports. 3, market reports. 4, French lesson; piano solos by Adelaide Apfel. 6, dinner hour concert, Selinsky instrumental quintet. 8, The Passion Play. 10, message from the Civil Service Department. 10:03, Cooper Corporation. The Cooper orch. and male quartet; solos and ensembles from the Cooper male quartet; selections by Larry Grueter, piano-accordion; popular program by The Doherty Melody Boys.

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, Arion trio; Winifred Hanlon, soprano; C. A. Harwell, whistler; Mrs. Cyril Roche, soprano; Hawaiian novelty three; Waldemar Engberg, bass; piano duets, William P. and Bonita Keasbey; address, "Music and Shirts." Rev. George W. Phillips; Joyce Holloway Barthelsson, pianist; Josephine Holub, violinist. 10, Henry Halstead's orch.

WMAK, Lockport, N. Y., 265 (E. S. T.)—12 M., Murray Whiteman's midnight serenaders.

KFI, Los Angeles, 467 (P. S. T.)—5 P. M., Herald news. 5:30, Examiner news. 6:45, KFI

radiatorial and Carlyle Stevenson's Bon Ton orch. 7:20, Y. M. C. A. speaker. 7:30, male quartet. 8, play with music. 9, Los Gatos trio, and Carol Blaine, contralto. 10, Examiner program.

WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M., Edmund F. Boettcher, singing; William H. McRaven, playing; DeWitt McMurray, speaking. 6:30, Lone Star Five's orch. 8:30, Miss Lucie Lechner, singing, and Mrs. Lillian T. Cummings, pianist. 11, violin recital by Edward Cramer, first violin in the orch.

WOAW, Omaha, Neb., 526 (C. S. T.)—12:30 P. M., horticultural program. 5:45, public news period. 6, every child's story hour. 6:20, to be announced. 6:45, dinner program, Randall's Royal Fontenelle orch. 9, program transmitted from WOAW. 10:30, Frank W. Hodek, Jr., and his Nightingale orch.

WEEI, Boston, 303 (E. S. T.)—1 P. M., assembly

(Continued on next page)

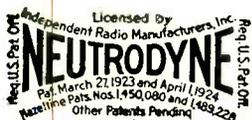


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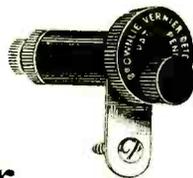
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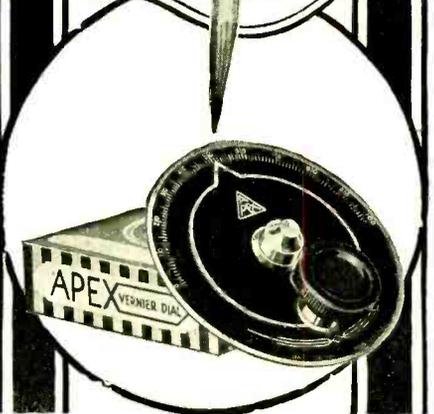
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Programs

(Thursday, March 5, continued)

luncheon. 2, Eleanor Baldwin Cass, "Your Girl and the Movies." 3:15, Noah's Arkadians, Joe W. Rines, director. 6:30, Big Brother Club. 7:15, sport talk by Wm. E. Mullins. 7:25, program arranged by the Greater Boston Churches. 7:55, Pathe News flashes. 8, New York program, musical. 8:30, musical. 9, Atwater-Kent musical. 10, musical.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., selections from Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain market reports. 5, time. 7:30, concert under the auspices of Mrs. Robert K. Van Pelt; four-minute digest of Sunday school lesson; four-minute talk; late news; official time.

KOA, Denver, Colo., 323 (M. S. T.)—12:20 P. M., Rialto organ recital. 1, N. Y. stock reports, live stock, fruit, vegetable report, and weather. 3, half hour matinee for housewives. 6, final reading,

N. Y. stock reports, live stock, vegetables, and late news.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M., news; weather. 4:40, stock market; The Sunshine Girl. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, special feature. 8, Moore's radio review. 9, Atwater-Kent radio artists.

WMC, Memphis, Tenn., 500 (E. S. T.)—9:30, P. M., Harry O. Nichols at the console of the Scottish Rite Cathedral organ.

WDAF, Kansas City, Mo., 365 (C. S. T.)—3:30 P. M., The Star's radio trio. 5:50, marketgram, weather, time and road. 6, Cecile Burton, from popular poems and essays; address, one of a series of book talks by Louis Mecker; The Tell-Me-a-Story Lady; music, Trianon ensemble. 11:45, Nighthawk Frolic.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeezix time for children. 5:57, time.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio. 5, children's program. 7:15, markets, weather, and news bulletins. 8, Oregonian concert orch. 10, Multnomah Hotel Strollers.

Friday, March 6

WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercises. 10:45, weather and business reports. 11:55, time. 12:15 P. M., Ahaus Brunswick orch. 1:30, business reports.

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. 4, concert orch. 6:45, stock reports, weather, S. F. produce news, and news.

KFI, Los Angeles, Cal., 467 (P. S. T.)—5 P. M., Herald news. 5:30, Examiner news. 6:54, KFI radiatorial. 7, Examiner program. 8, Aeolian organ recital, Dan McFarland at console. 9, Herald program. 10, Hollywood Girls quartet and soloists.

WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M., address, Dr Robert Stewart Hyer. 4:30, Woman's Hour. 6:30, Honey Boys orch. 8:30, band and entertainers.

WEEL, Boston, 303 (E. S. T.)—2 P. M., Happy Hawkins and his orch. 6:30, Big Brother Club. 7:15, concert by the U. S. Army band. 8, program by Ice Cream Co. 8:30, The Gilchrist quartet. 9, Grindell's Colonial Club orch.

KFOA, Seattle, Wash., 455 (P. S. T.)—Times Studio program, by Mrs. H. C. Simpkin.

KHJ, Los Angeles, Cal., 404 (P. S. T.)—12:30 P. M., Santa Monica athletic club orch; R. M. Wright, baritone; Pathe News talks. 2:30, matinee musical. 6, Art Hickman's concert orch. 6:30, children's program. 7:30, better-speech talk. 7:45, Capt. John T. Riley, on "Income Tax." 8, program through Henley and Scott. 10, Art Hickman's dance orch.

WOAW, Omaha, Neb., 526 (C. S. T.)—4 P. M., program transmitted from WOAW's remote control. 5:45, public news period. 6, story hour. 6:20, to be announced. 6:30, Harry Brader, violinist-conductor, and Frank Strawn, pianist, of the Rialto Symphony orch. 7, to be announced. 7:15, current sport events by Ivan L. Gaddis. 9, program under auspices of Chicago, Burlington & Quincy Railroad Co.; address, "Seeing by Radio Territory Covered by the Burlington Route," Dr. G. E. Condra. 10:30, orchestra at Brandeis.

KOA, Denver, Colo., 323 (M. S. T.)—12:30 P. M., Rialto organ recital; N. Y. stock reports, live-stock, fruit, vegetable report, and weather. 3, half hour matinee for housewives. 6, final reading N. Y. stock reports, livestock, vegetables, late news. 6:40, book of knowledge program. 8,

ten minutes of music. 8:10, studio program, courtesy the Tuesday musical club.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., selections from Louisville Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain market. 5, time. 7:30, concert by Barney Rapp's orch.; thirty-minute concert.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M., weather; news. 4:30, Sunshine Girl; stock market. 6:30, dinner concert. 7:30, Uncle Kaybee. 8:30, Apollo quartet. 9:30, Hampton S. Lundenstadt, baritone.

WMC, Memphis, Tenn., 500 (E. S. T.)—8:30 P. M., to be announced. 11, midnight frolic.

WDAF, Kansas City, Mo., 365 (C. S. T.)—3:30 P. M., The Star's radio trio. 3:50, marketgram, weather, time and road. 6, address, speaker from Children's Bureau; The Tell-Me-a-Story Lady; the Trianon ensemble. 8, popular program. 11:45, Nighthawk Frolic.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeezix time for children. 5:57, time.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio; 5, children's program. 7:15, markets, weather,

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Programs
(Friday, March 6, continued)
and news bulletins. 8, lecture. 10:30, Hoot Owls. **WGBS, New York City, 316 (E. S. T.)—6:30 P. M.**, Herman Bernard, managing editor of RADIO WORLD, "Radio Hookups, Questions and Answers." Mr. Bernard is on the air at this station every Friday at 6:30 P. M.

Saturday, March 7
WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M., setting-up exercises. 10:45, weather and business reports. 11:55, time. 1:30 P. M., business reports; stock quotations. 3, dance program and other features. 6, dinner hour concert; Lafafone by E. D. Leonard. 8:30, popular music presented symphonically by Henry Lange and his Hotel Sinton orch.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 12:30 P. M., final reading, stock reports; weather. 4, concert orch. 8, The Melody Maids; Elsa Behlow Trautner, soprano; Carey male quartet; concertina solos, Antone Tomasic; Eva Gruninger Atkinson, contralto; Ray Nealan, tenor; address, "The Sunny Side of the Street," Thomas A. Boyer. 10, Henry Halstead's orch.

KFI, Los Angeles, Cal., 467 (P. S. T.)—5 P. M., Herald news. 5:30, Examiner news. 6:45, KFI radiatorial; Dr. Clyde Sheldon Shepherd. 7, Lake Arrowhead orch. 7:45, the book shelf. 8, Examiner program. 9, Classic instrumental trio, and vocalists. 10, Packard Radio Club; the Varsity trio, Barney Weber, Jean Shock, pianist.

WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M., Alex Hughes, pianist. 8:30, Boy Scout program. 11, band recital by De Molay boys.

KHJ, Los Angeles, Cal., 404 (P. S. T.)—10 A. M., weekly broadcasting class. 12:30 P. M., program by Hi Moulton and his orch. 2:30, Saturday afternoon frolic. 7:30, better-peech talk. 7:45, Capt. John T. Riley, on "Income Tax." 8, program featuring a "Trip to Mt. Lowe." 12, pep program by the Lost Angels.

WOAW, Omaha, Neb., 526 (C. S. T.)—5:45 P. M., public news period. 6, dramatic hour, Davis Studio of Expression. 6:30, to be announced. 6:45, dinner program. 7:30, weekly address. 9, program under auspices of the Omaha Printing Co. 11, Frank W. Hodek, Jr., and his Nightingale orch. 11:30, organ music.

WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M., selections from Louisville Conservatory of Music; police bulletins; weather; readings; late news. 4:55, local livestock, produce and grain market. 5, time. 7:30, concert under the auspices of Arthur Findling; news; time.

KOA, Denver, Colo., 323 (M. S. T.)—12:20 P. M., Rialto organ recital. 1, final reading. N. Y. stock reports, livestock, and weather. 9, dance music program by Joe Mann and his Rainbow-Lane orch.

WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M., news; weather. 2:30, tea-dansant music. 4:30, orchestral program. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, special feature. 8:30, concert by artist students.

WMC, Memphis, Tenn., 500 (E. S. T.)—8:30 P. M., program arranged by Mrs. Marie Worden.

WDAF, Kansas City, Mo., 365 (C. S. T.)—3:30 P. M., The Star's radio orch. 5:50, marketgram, weather, time and road. 6, piano tuning-in number; address, personal message from Roger W. Babson, statistical expert and "doctor of business"; The Tell-Me-a-Story Lady; music, the Traanon ensemble. 11:45, Nighthawk Frolic.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert by Rose City trio. 10, Colburn's Melody Men.

WGN, Chicago, 370 (C. S. T.)—9:31 A. M., time. 9:35, stock and farm quotations. 10, wheat. 10:30, wheat and cable reports. 11, wheat, weather, dairy reports. 11:30, wheat, grain and livestock receipts. 11:56, time. 12, wheat, board of trade. 12:10 P. M., board of trade quotations; hog sales. 12:35, Tea Room orch. 1, wheat. 1:05, Tea Room orch. 1:35, readings. 1:40, Drake concert ensemble and Blackstone string quintet. 2:30, musical recital. 3, miscellaneous entertainment. 5, stock exchange and market. 5:30, Skeezi time for children. 5:57, time.

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