September 13 1924 15 Cents

TUBELESS SET WORKS LOUD SPEAKER

RADIO WORLD

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VOL. 5. NO. 25. ILLUSTRATED EVERY WEEK

An Important and Practical Solution

THE REV. HENRY A. JUDGE, S.J.

of a Subject Long Under Experiment

By The REV. HENRY A. JUDGE, S.J.

(Foto Topics)

ME, MY RADIO AND MY DOG

"A dog's life" doesn't mean what it used to, since radio's advent. (Posed by Marilyn Miller.)

A 3-TUBE REFLEXED NEUTRODYNE

By N. N. BERNSTEIN
Technical Editor

DE FOREST WINS PATENT FOR REGENERATION

By BYRT C. CALDWELL

HOW TO MAKE A LOOP ON A PHONOGRAPH RECORD

By HERBERT E. HAYDEN

A LOW-LOSS 3-CIRCUIT TUNER

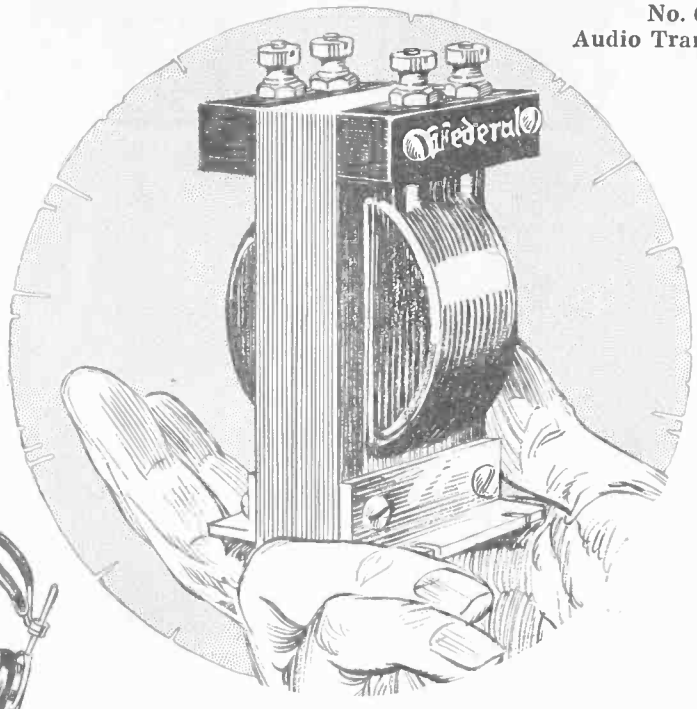
By NEAL FITZALAN

RHEOSTATS

By A. P. PECK

A REAL SET ON A 5″ x 5″ PANEL

By HERMAN BERNARD



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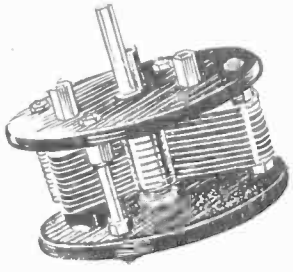

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RADIO WORLD'S FALL BUYERS' ISSUE

SEPT. 27th

Answers most every radio question. The leading radio manufacturers are advertising their new fall model sets in this Fall Buyers' number and many revolutionary things in radio. Some of the articles in this issue will include "The Right Way to Buy Parts," "Selecting a Complete Set," "The Amazing Growth of Radio," "Resistance-Coupled Audio-Frequency," "The Lure of the Crystal," "Why the Best Loud Speakers Behave," Complete List of Broadcasting Stations, Review of the Leading Radio Products.

NOTICE TO ADVERTISERS

This Fall Buyers' Number of September 27 will be advertised to millions; have thousands of extra readers; will have unusual reader interest, and copy received by September 15 for half-page or over will be given an extra color, red, on request, without additional charge. Last advertising form closes September 18.

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VOLUME FIVE OF

RADIO WORLD

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

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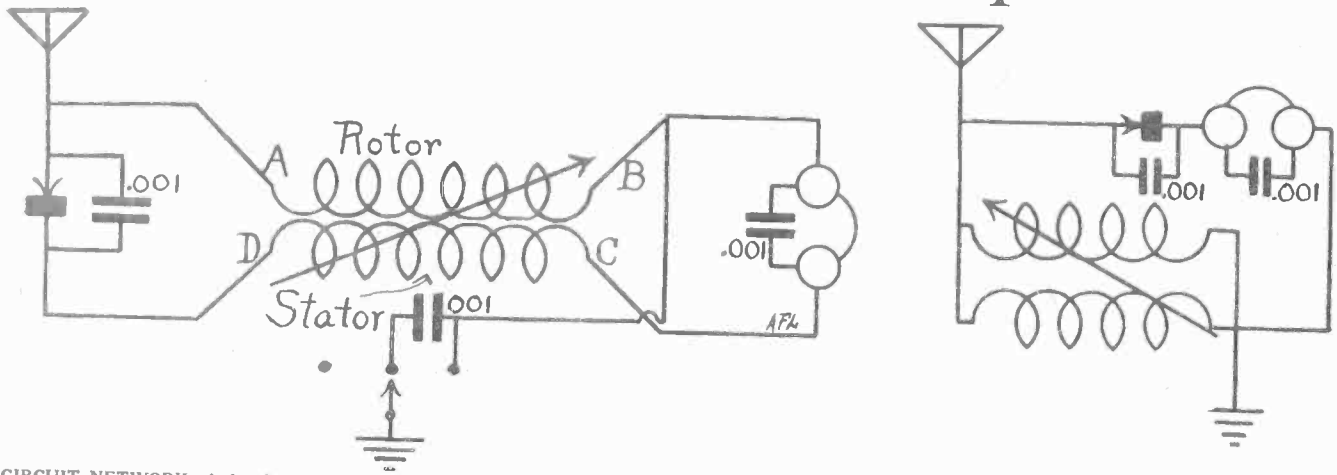
Tubeless Set Works Speaker



CIRCUIT NETWORK of the detector used by the author (Fig. 1). It is a selective crystal set and was decided on after much experimenting. At some sacrifice of volume great selectivity is obtained and thus one knotty problem solved in the 1-dial crystal set. The tuning control is a heavy-wire variometer. The stator is AB, the rotor CD. The aerial and one side of the fixed crystal are connected to the beginning of the stator (A). The end of the stator (B) goes to the ground and to one of the phones. The beginning of the rotor (C) goes to the other phone and the end (D) to the remaining side of the crystal detector. Three fixed condensers are used. They are .001 mfd. each. Fig. 3 (at right) is not selective enough.

By the Rev. Henry A. Judge, S. J.

[The author is Chaplain at Welfare Island, New York City, and a radio experimenter of many years' experience. He is an authority on the subject he discusses.]

THE following experiments in radio reception will, I believe, prove of no little interest to radio enthusiasts, not only in this country, but also abroad:

Some time ago I conceived the idea of obtaining favorable results in loud speaker reception without using any vacuum tubes. In a conversation with a friend who is an expert I broached this plan in the following terms: "Why couldn't I take the input from a crystal set and amplify it by mechanical means?" In reply he shrugged his shoulders and said: "I don't think it possible." Next I consulted an engineer of one of our largest manufacturing concerns and he was even more emphatic on his views. "I have been through all this long ago," he said. "My recommendation is, don't attempt it." Despite all this dissuasion, the idea, as it were, haunted me like a nightmare and I had to try the plan out. Now after my experiences I am tempted to exclaim: "Persistency, thou art a jewel!"

I will describe very exactly how I succeeded, so that any of my readers who cares to repeat the experiment for himself may do so.

First, I tried out various crystal circuits to get the strongest possible input. I did not accept the say-so of anybody, but worked the problem out for myself. The conclusion of my researches was that the following (Fig. 1) was the best for both volume and selectivity. Other arrangements give slightly better volume but little selectivity.

It will be observed that this circuit differs somewhat from the usual run of crystal circuits. The crystal is fixed. The variometer is split, but of large-sized wire. I use a Sleeper variometer of No. 16 wire, specially wound, but No. 19 or 20 is about as good. "Why," you will ask, "do you put the variometer across the line?" Because I get better selectivity thereby. The reason for this, I believe, is that the variometer acts not only as an instrument of inductance across the line, but also as a condenser. The wires of the rotor and stator have a capacity effect because they recede from and approach each other as you turn the dial. Why put the crystal in its isolated position? Because the greatest effects of variation are observable around the crystal. To satisfy himself on this point, let the reader take a variable condenser and try it when shunted around the coil, then around the phones, and finally around the crystal. He will notice that the latter is far more sensitive to variations. A fixed condenser which may at will be thrown in on the ground line also helps at times for

Father Judge's Novel Set

selectivity. It might be well to add that my aerial is perfect, all connections soldered and double porcelain insulators at each end. It was set up by a radio instructor in one of our large universities who is a stickler for careful construction of the antenna. My ground was connected to a water pipe, but to make assurance doubly sure I joined in an adjacent room the hot-water, cold-water, sewer, and steam pipes by wiring. Using the Lego fixed crystal, which is very sensitive, the volume I receive is surprising. I myself am astonished that without any amplification whatever so much energy should be received. When I join to my binding posts (I avoid jacks on account of unpleasant experiences with them), the cords of a Western Electric loud speaker, I can hear distinctly, though not loud, the words of the announcer of stations two miles distant, event when I stand several feet away from the horn. This certainly is remarkable. In this case the cords are joined directly to the small inner coil which actuates the needle attached to the diaphragm. Furthermore the quality of tone of a crystal detector is incomparably superior to that of a thermionic tube. A person who listened in exclaimed: "Isn't this sweet?" This expression characterizes in a way the tone-quality of this form of receiver. It is so clear, so pure, as to be absolutely perfect. By itself the set described is without any addition an excellent one.

PARTS FOR DETECTOR

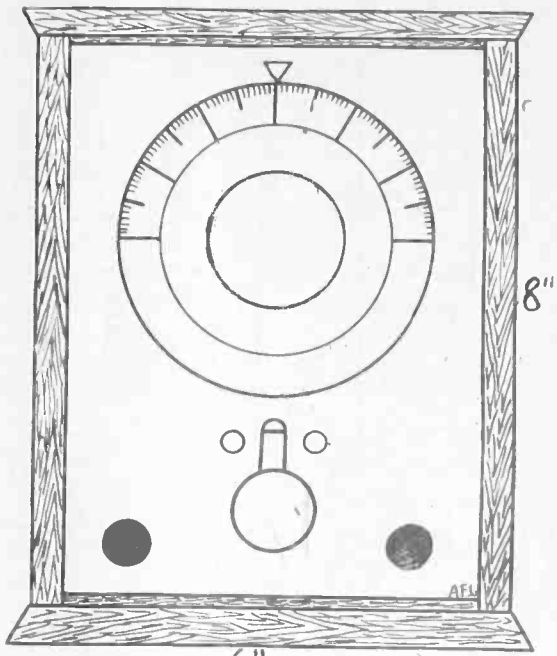
One 5x7 inch panel.
One special cabinet to match.
One coarse-wire variometer.
One Lego fixed crystal.
One 3-point switch.
Two binding posts.
One 4 inch dial.
Three .001 fixed condensers.
One pair of earphones.
Connecting wire, 100 feet aerial wire, 50 feet No. 18 insulated lead-in wire.

Wiring Directions

Split your variometer, i. e., separate the rotor wires from the stator wires. The cat tails are the rotor; the other halves joined are the stator. To avoid confusion, determine each wire by a special color. Using a colored cord, tie a piece to each terminal. For instance, ground wire, black; antenna, white; rotor ends red; stator ends blue; inside phone connections which go to binding posts, green; the crystal wires gray. You will be surprised at how much time and trouble this little expedient will save you.

Pass your antenna and ground leads out through the lower back board of your cabinet, making two holes for them and knotting them on the inside so that no chance pull will break your connections. The ground wire is connected to the middle point of the switch. The point at left is blank, hence when the lever is on that there is no connection; you have signed off listening. The middle point is connected to the bottom of the stator (b) and when the lever is on it, stator and ground are in direct union. The point at right is connected to the middle point by a little fixed condenser. Hence when the lever is on it the impulse from the aerial passes first through the stator, then through the condenser to the ground.

The reader may desire further information regarding experiments that led me to select the above circuit. First of all I tried the variometer split and joined in multiple on one side of the line (Fig. 3). This gives a little greater volume because it reduces the resistance on the circuit, but you turn your variometer dial around in vain to eliminate one station and bring in another. Again if I go back to the original circuit and use only one-half the rotor and one-half the stator I get marked increase of volume, for the same reason as above, but poor selectivity. Therefore I was obliged to sacrifice a little volume for selectivity. I also used the stator as a primary and the rotor as a secondary, but suffered a loss in both volume and selectivity. The radio experts



PANEL of the 1-dial crystal set, with dimensions of cabinet marked. The panel is 5 x 7 inches, but instead of the long side being horizontal it is upright. (Fig. 2). The cabinet is drawn one-half scale.

who have been insisting on the large-wire variometers are absolutely correct. There are two results to be obtained—plenty of inductance, for the sake of the selectivity, and as little resistance as possible, for the sake of volume. The only ways of obtaining these results, so far as I know, (1) by lengthening your wire and (2) by increasing its size. The variation in the length of the coil has by itself a tuning effect, but I find the variation of the variometer simpler and more efficient. The fixed condenser in the antenna-ground line has a splendid tuning effect at times, i.e., when you have two stations of close wave length audible at the same time. By switching in this condenser, and turning your dial it is remarkable how one is favored and the other reduced to silence. Strange to say a large variable condenser on this line is no better than a simple fixed one.

Having determined the best input, my next step was to arrange an amplifier. Years ago in conversation I had heard of a successful telephone relay, but I found considerable difficulty in locating one. I had almost determined on contriving one myself when I met an expert in telephonic work who told me of one made by the Western Electric Co., and used by the New York Central Railroad for train dispatching. It is part of an elaborate circuit and has subsidiary coils in itself. Besides each unit is carefully closed in a metal box and sealed with a wired leaden seal so that not even the electricians of the railroad can get a glimpse of it. It did not in that form suit my purpose. Fortunately I learned from an agent of the company in charge of train dispatching that there was another relay, the patents of which are controlled by William M. Clark of South Orange, N. J. It is used by the Brooklyn-Manhattan Transit Co. and others for sending by telephone a message loud enough to be heard by several persons in a hall or open space. It is essentially a telephone relay though commonly called an amplifier. It consists of a receiver into which the spoken message is sent, and a transmitter which is connected to a new battery circuit and a loud speaker or megaphone. This amplifier, though enclosed in a metal cylinder, can be opened. It is interesting to know how it operates.

(*Next week, Part II, the conclusion*)

The Reflexed Magnadyne

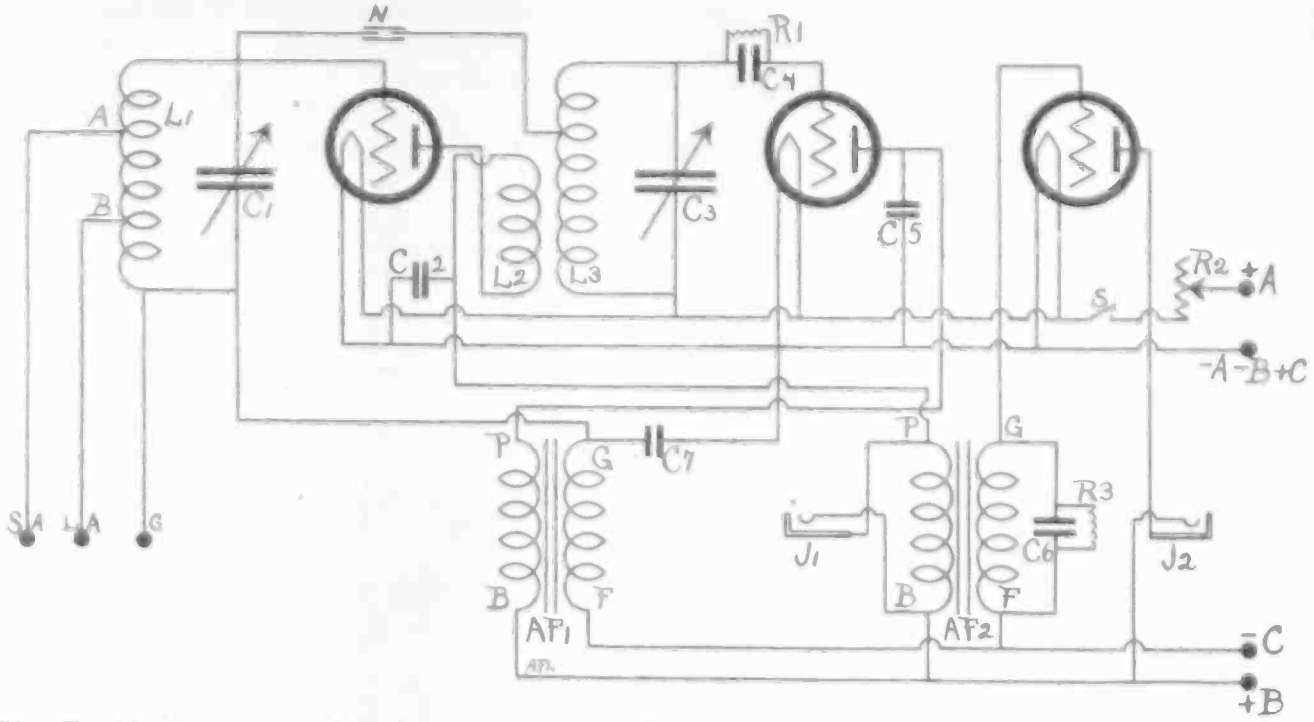


FIG. 2—The wiring diagram, showing clearly the connections to RF and AF transformers. If no C battery is used, place a jumper across plus C and minus C. The filament switch S goes in the positive A battery lead. R1 may sometimes be omitted, and in many cases the circuit works just as well without it. R3 improves the tone quality. C1 and C3 are 17-plate variables. C4, C5, C6 and C7 are .00025 mfd. fixed condensers. C2 is a .006 mfd. fixed condenser.

By N. N. Bernstein

Technical Editor

ALTHOUGH the 5-tube Neutrodyne type of receicer is undoubtedly the most popular set, there is a considerable demand for a similar set using less than five tubes. The ease with which tuning is done in the tuned radio-frequency circuits is another big factor to be taken into account when designing a new instrument to meet the demand. In issues of August 16 and 23, RADIO WORLD, I described thee Magnadyne, a low-loss Neutrodyne using the regulation five tubes—two radio, detector and two audio stages. Builders of this outfit have reported very good success. Requests have been made for a circuit using the low-loss Dyno coils as in the Magnadyne, with three tubes. Of course reflexing them becomes necessary and proper coils for the circuit must be designed. The circuit uses one stage of radio-frequency, detector, first audio stagee reflexed through the RF stage, and one stage of straight audio-frequency amplification. An advantage is gained through the use of the low-loss coils originally described in the Dynoflex article published in RADIO WORLD for August 9.

As there are only two coils used, both of them tuned, there are only two tuning condensers. One 10-ohm rheostat controls the three tubes which should be uniform in type. The tubes should be of the 6-volt storage battery type. The inclusion of the C battery for the AF stages enables the use of two 5-to-1 ratio audio transformers without danger of distortion. Two single-circuit jacks are used, J1 for tuning in and J2 for the loud speaker. J1 is placed after the first (refixed) audio stage and is simply a tap across the primary of the second AF transformer. The secondary of the second AF transformer is shunted with a .00025 mfd. fixed condenser and a 2 megohm leak.

The Dynocoil for the first tube consists of 60 turns or No. 22 double silk or cotton covered wire with a tap at the eighth and fifteenth turns. The tap at the eighth turn, which is used with a short or indoor antenna, includes 52 turns of the coil for the input. The second tap used with the regulation outdoor antenna uses 45 turns for the above purpose. Fig. 1 is the winding form (see page 14). The forms are cut to the same size as the drawing on stiff cardboard. First use tracing paper on the drawing, then paste the tracing on the cardboard and cut.

One neutralizing condenser may be necessary, and it may be cheaply purchased at any radio store. Get the bus bar type which is easy to adjust.

L1 (Fig. 2), the Dynocoil (see page 7) is wound in spider-web fashion with small twisted loops of wire at the designated places for taps. L2 has two windings, the primary or plate coil 15 turns, and the secondary or grid coil 60 turns of No. 22 double silk or cotton covered wire. Measure off about 11 feet of wire from the spool, double it at that point and wind both strands onto the form as if they were one wire. At the fifteenth turn, disengage the free end of the eleven foot length and continue winding from the spool, until 60 turns have been made, but make a tap 12 turns from the end. Cut the beginning of the winding at the hub so as to separate the beginning of the primary and secondary windings. Tie a piece of thread to the beginning of the primary to distinguish it from the secondary. After both coils have been wound, thread up and down tightly between spokes with linen or thread and tie the ends firmly. The cardboard spokes are then cut away and pulled out, the coils remaining self-supporting. Both coils are mounted as shown in the assembly plan, Fig. 3, by means of the short pieces of bus bar which also serve as connecting wires. But brass angles may be used, if preferable.

As shown in the assembly diagram, L1, is mounted at right angles to the panel, and L2 and 3 parallel with it, thus taking up minimum space. The transformers and binding posts are laid out as shown, making short leads. In assembling it is a good plan to tackle the panel first. Fig. 4 illustrates the general panel scheme, and has accurate drilling nd spcing dimen-

A 3-Tube Neutrodyne

sions marked thereon. Lay out the panel markings first on a sheet of paper 12″ long by 7″ high, paste right onto the panel and drill right through the marked holes. When finished, soak the panel in warm water and the paper will come off.

Mount the condensers, rheostat, jacks and filament switch on the panel, screw the panel to the baseboard and then mount the tube sockets and transformers onto the baseboard.

The wiring (Fig. 2), although likely to be rather close in spots, is more easily done with flexible insulated wire than with bus bar. After the set is completely assembled, the wiring is as follows:

Plus A goes to the rheostat, then to the filament switch and on to the plus posts of all three sockets. The minus A lead goes to the negative posts of the sock The minus Alead goes to the negative posts of the socket. The minus C goes to the F posts of both AF transformers. The plus B goes to the blade of J2 and to the B posts of the two AF transformers. Tap A on L1 (8 turns) goes to post SA. Tap B (15 turns) goes to post LA. The end of L1 goes to post G, the stator plates of C1, and to G on the first AF transformers. The beginning of L1 goes to the rotar plates of C1, to one side of the neutralizing condenser N and to the grid of the first tube. The other side of N goes to the tap on L3. The plate of the first tube goes to the beginning of L2. The end of L2 goes to P on the second AF transformer. C2 goes from the end of L2 to the negative A lead. The end of L3 goes to the rotor plates of C3 and to one side of C4. The beginning of L3 goes to the stator plates of C3 and the positive A battery lead. The other side of C4 goes to the grid of the second tube. The plate of the second tube goes to P on the first AF transformer. C5 goes from the plate of the second tube to the negative of A battery lead..The grid of the third tube goes to G on the second AF transformere. C7 goes from post G on the first AF transformer to the negative A lead.J1 is shunted across the primary of the second AF transformer. C6 and R3 are shunted across the secondary of the second AF transformer. The plate of the third tube goes to the frame of J2.

To neutralize the RF tube, tune in on a local station operating around 360 meters, bringing the signal in as strong as possible. When the signal is loudest remove the RF tube and place a piece of paper under one of the filament pegs and re-insert the tube. The signal will still be heard, though faintly. Adjust the neutralizing condenser N until the signal is inaudible, or just faintly heard, and fix the condenser at that point. Take the piece of paper out of the socket and again replace the tube. You should now be able to tune over the whole range without the circuit going into oscillation at any point.

LIST OF PARTS

Two Dynocoils as described.
One 10-ohm rheostat.
Two single-circuit jacks.
Three tube sockets.
Two 4″ dials.
Two low-loss 17-plate condensers.
One neutralizing condenser.
Two 5-to-1 audio transformers.
One filament switch.
Two 4 dials.
Two 4″ dials.
Seven binding posts.
Four .00025 mfd. fixed condensers.
One .005 mfd. fixed condensers.
Two grid leaks, variable preferred.
One 7x12x3/16″ panel.
One 11x9x1/2″ baseboard.
One 7x12x10″ cabinet.
Three 201A type tubes.
Ninety volts B battery, hardware, connection wire, aerial wire, etc.

[*Those who construct this circuit are requested to write to Results Editor, Radio World, 1493 Broadway, New York City, and state how they fared. When possible give the trade names of the parts you use, or the manufacturers' names. Results letters will be published, including trouble-shooting letters. Readers may include questions in the same letter. The questions will be answered in the Radio University Department.*]

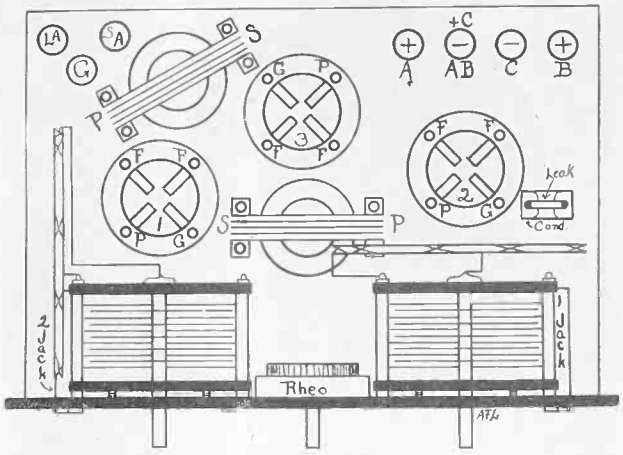


FIG. 3—Assembly plan. The Dynocoils take up very little space when mounted as shown. The AF transformers are very close to the tube sockets, permitting very short leads. Take care to mount them with primaries and secondaries facing as shown in the diagram. One end of the grid condenser and leak may be mounted to the G post of tube 2. If no C battery is used short circuit the binding posts marked + C and — C.

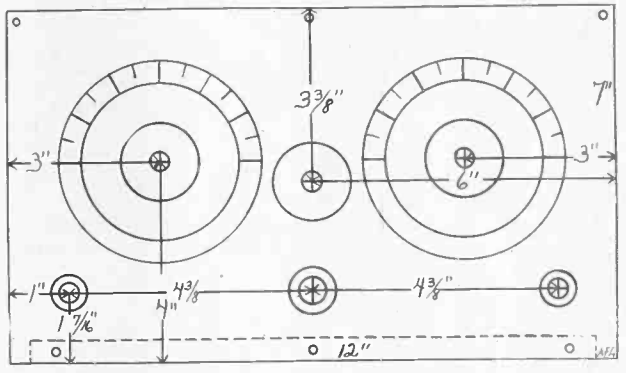
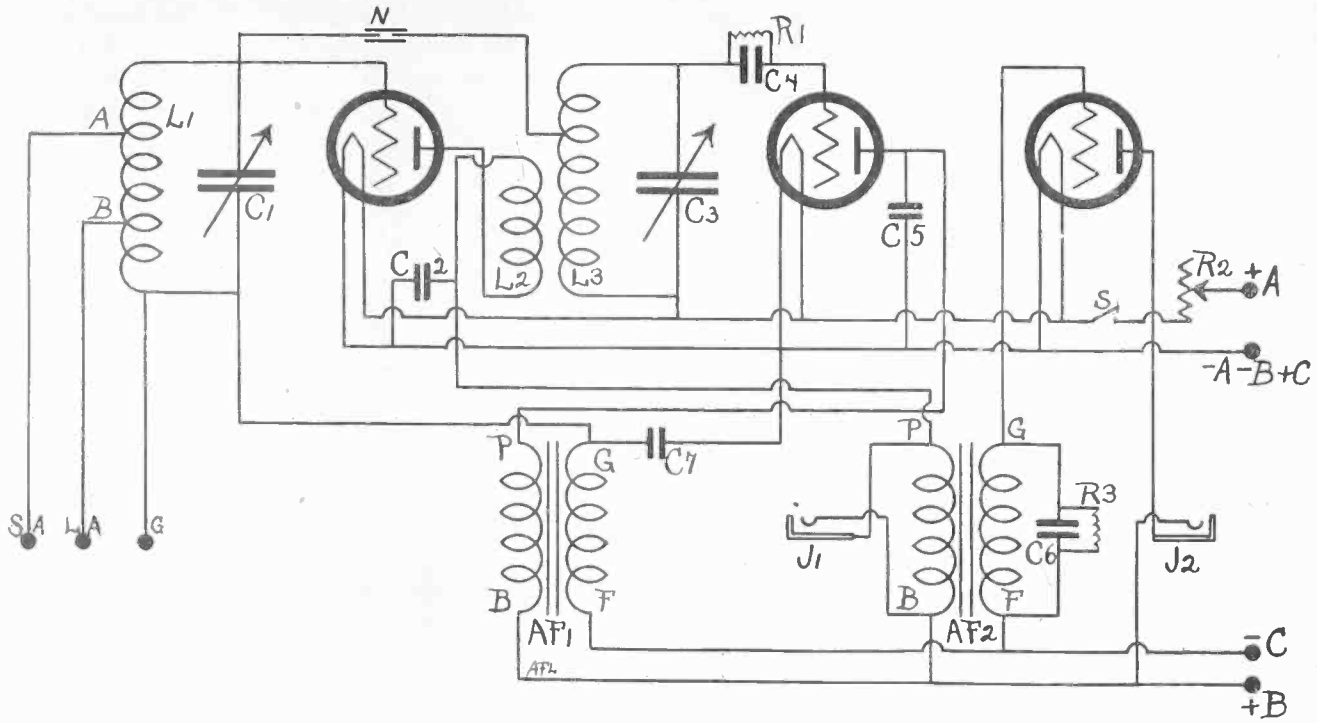


FIG. 4.—The panel design is symmetrical in appearance and permits easy operation of the controls. The rheostat is between the two tuning dials and the battery switch directly underneaht. J1 is at the right and J2 at the left.

Final Resorts for Reviving Tubes

MANY owners of reflex sets find that their tubes have become paralyzed after but two or three months of use. If keeping the tubes lighted with the B battery current turned off does not improve matters any there are two things left—to send the tubes away for refilling and to shock them into activity. The tubes are shocked in the following manner: The A battery is disconnected. Run a lead from a 22½-volt B battery to one of the A battery teminals. Then just touch the other B wire for the smallest possible fraction of time to the remaining A terminal. For the dry cell tubes use 16½ volts. There is a possibility that the tubes may be blown out, unless you make the period of electrical contact just as short as possible. It is a sporting chance and yet there is nothing much to be lost if the tubes do blow, as the tubes are of no practical use. The writer may have been fortunate in this respect, for, out of thirty-eight tubes that he has shocked there have been but three casualties. And these three had been shocked seven times in rapid succession!

The Reflexed Magnadyne



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The wiring (Fig. 2), although likely to be rather close in spots, is more easily done with flexible insulated wire than with bus bar. After the set is completely assembled, the wiring is as follows:

The A goes to the rheostat then to the filament switch and to the plus posts of all three sockets. The minus A lead goes to the negative posts of the sock. The minus A lead goes to the negative posts of the socket. The minus C goes to the F posts of both AF transformers. The plus B goes to the blade of J2 and to the B posts of the two AF transformers. Tap A on L1 (8 turns) goes to post SA. Tap B (15 turns) goes to post 1A. The end of L1 goes to post G, the stator plates of C1 and to G on the first AF transformers. The beginning of L1 goes to the rotar plates of C1, to one side of the neutralizing condenser N and to the grid of the first tube. The other side of N goes to the tap on L3. The plate of the first tube goes to the beginning of L2. The end of L2 goes to P on the second AF transformer. C2 goes from the end of L2 to the negative A lead. The end of L3 goes to the rotor plates of C3 and to one side of C4. The beginning of L3 goes to the stator plates of C3 and the positive A battery lead. The other side of C4 goes to the grid of the second tube. The plate of the second tube goes to P on the first AF transformer. C5 goes from the plate of the second tube to the negative of A battery lead. The grid of the third tube goes to G on the second AF transformer. C7 goes from post G on the first AF transformer to the negative A lead. J1 is shunted across the primary of the second AF transformer. C6 and R3 are shunted across the secondary of the second AF transformer. The plate of the third tube goes to the frame of J2.

To neutralize the RF tube tune in on a local station operating around 360 meters, bringing the signal in as strong as possible. When the signal is loudest remove the RF tube and place a piece of paper under one of the filament pegs and re-insert the tube. The signal will still be heard though faintly. Adjust the neutralizing condenser N until the signal is inaudible, or just faintly heard and fix the condenser at that point. Take the piece of paper out of the socket and again replace the tube. You should now be able to tune over the whole range without the circuit going into oscillation at any point.

LIST OF PARTS

Two Dynocoils as described.
One 10 ohm rheostat
Two single-circuit jacks
Three tube sockets
Two 4" dials
Two low loss 17 plate condensers
One neutralizing condenser
Two 3-to 1 audio transformers
One filament switch
Two 4" dials.
Two 4" dials.
Seven binding posts
Four .00025 mfd. fixed condensers
One .005 mfd fixed condensers
Two grid leaks, variable preferred
One 7x12x3 16" panel.
One 11x9x1 3" baseboard
One 7x12x10" cabinet.
Three 201A type tubes
Ninety volts B battery, hardware, connection wire, aerial wire, etc

[Those who construct this circuit are requested to write to Results Editor Radio World 1 6 Broadway New York City and state how they fared. When possible give the trade names of the parts you use or the manufacturers' names. Results letters will be published including trouble-shooting letters. Readers may include questions in the same letter. The questions will be answered in the Radio University Department.]

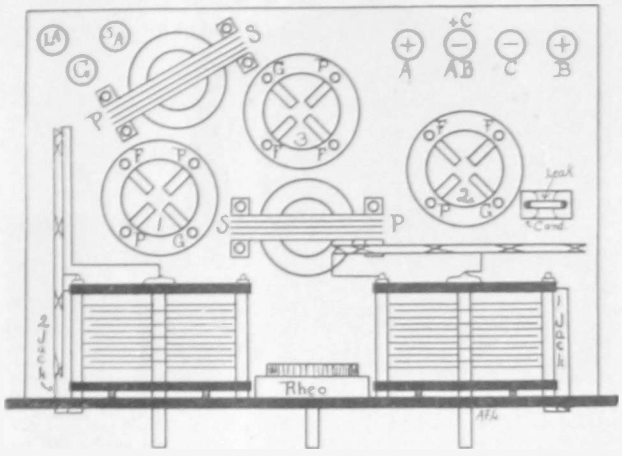


FIG. 3—Assembly plan. The Dynocoils take up very little space when mounted as shown. The AF transformers are very close to the tube sockets, permitting very short leads. Take care to mount them with primaries and secondaries facing as shown in the diagram. One end of the grid condenser and leak may be mounted to the G post of tube 2. If no C battery is used short circuit the binding posts marked + C and — C

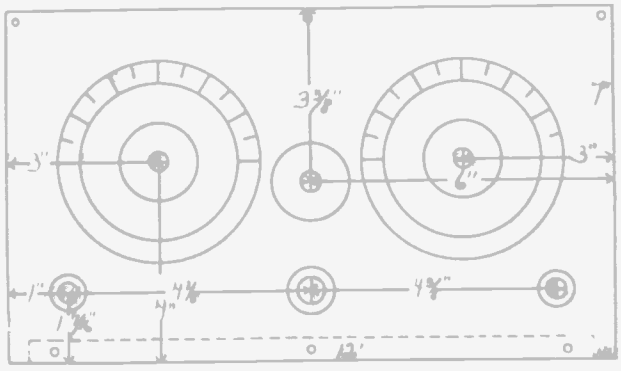


FIG. 4.—The panel design is symmetrical in appearance and permits easy operation of the controls. The rheostat is between the two tuning dials and the battery switch directly underneath. J1 is at the right and J2 at the left

Final Resorts for Reviving Tubes

MANY owners of reflex sets find that their tubes have become paralyzed after but two or three months of use. If keeping the tubes lighted with the B battery current turned off does not improve matters any there are two things left—to send the tubes away for refilling and to shock them into activity. The tubes are shocked in the following manner. The A battery is disconnected. Run a lead from a 22½-volt B battery to one of the A battery terminals. Then just touch the other B wire for the smallest possible fraction of time to the remaining A terminal. For the dry cell tubes use 16½ volts. There is a possibility that the tubes may be blown out unless you make the period of electrical contact just as short as possible. It is a sporting chance and yet there is nothing much to be lost if the tubes do blow, as the tubes are of no practical use. The writer may have been fortunate in this respect, for, out of thirty-eight tubes that he has shocked there have been but three casualties. And these three had been shocked seven times in rapid succession!

A Loop on a Phonograph Record

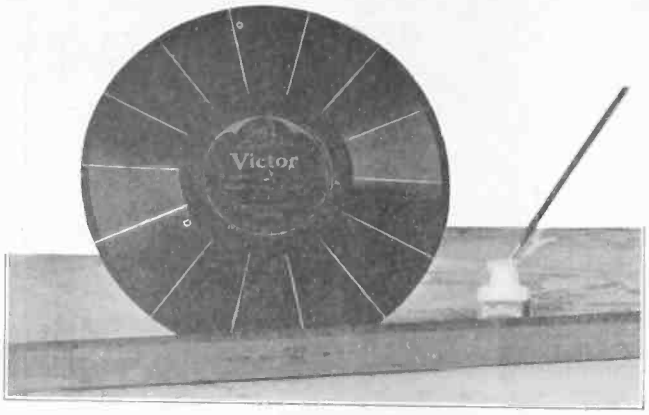


FIG. 1—Any old 10- or 12-inch phonograph record may be pressed into service for use as the support for a radio loop. Mark off with a ruler 14 lines spaced at equal distances. This will provide seven spaces and seven arms. The photo shows just how to mark the record. The record is marked down as far as the voice grooves extend inwardly. Hence your phonograph records may be resurrected for some use, after all!

By Herbert E. Hayden

MANY loops are designed for a special purpose or with a particular set in mind, or the mechanical construction is such that the limitations naturally imposed on the home workshop are not taken into consideration.

In presenting the spider-web phonograph record loop I make no claim that all aerials will disappear from the housetops, but if you want to have a little constructional fun—read on.

Pick out an old 10-inch record (Fig. 1) and with a white pencil, ink or a piece of chalk, mark off fourteen lines as shown. Next get a hack saw blade and base. Cut seven sections out of the record with the hack saw and attach a piece of five-eighths dowel stick as shown in Fig. 2. If you have no hack saw, use a hot knife.

You now reach the result shown in Fig. 3. Four little rubber-covered tacks are driven in the base so the base will not scratch any polished surface. Now place a fixed condenser (it does not make any difference what capacity, for the moment) on the label of the record and drill a hole through the record on each side through the eyelet holes in the condenser.

The next step is the subject of much argument. If you are inclined to be fussy you will want about 75 feet of Litzendragt wire. It is also possible you will want to file a little notch on the edges of the segment so each wire will be spaced evenly.

Fig. 4 shows one way of starting off. In this particular experiment, 85 feet of No. 18 DCC wire was wound on the spider-web form. When it was finished, it appeared as you see it in Fig. 5, plus the two Fahnestock binding posts, the telephone connecting cords. On the other side of the web (Fig. 6) a .00001 fixed condenser was shunted across, held in place by two thumb nuts.

The web was tried with a one-tube set, but a good one. This didn't work so well at the start and the condenser was removed, with a slight improvement, as the capacity in the telephone cords seemed to be about right. Things began to brighten up a little better when other capacities were substituted, and with an entirely different set it was found that 50 feet of No. 20 DCC with .0002 condenser in shunt gave very excellent results and quiet operation on a night when static was rather snappy.

No particular connection is advised. Under some conditions you will notice that by simply connecting one cord to the aerial post and the other to the ground post the web will work. Again it may be necessary to use the usual ground and just one side of the loop connected to the aerial post. Many combinations can be worked out, and the performance varied. The whole thing can be made in less than an hour and the experiment is very interesting.

If one particular size and covering of wire doesn't please you, just unwind and start all over with a different size and length, or if you want a spider-web a bit larger, use an old 12" record, saw out the sections and proceed in the same manner.

Many experiments could be made with this type of loop which should be interesting and instructive. For example, in the case of 5-tube Nentrodyne sets the loop might be put in the detector grid lead and tuned with a small-size variable condenser. This might have the effect of increasing the strength of the incoming signals on the detector grid where every particle of energy counts. The aerial and ground connections are not disturbed. Another plan would be to put the loop in the plate circuit of the Neutrodyne and also tune it there with a 17-plate condenser. Regeneration would probably be the result and on the whole some interesting features may be developed.

The phonograph loop might also be fastened to the top of a pole on the roof and a lead from one end be brought down to the set. This would take up very little room and with some sets would probably function as well as the L type antenna. Of course, it could not conveniently be adjusted for direction, but since only one side of the loop would be connected to the set and the ground connected thereto also, there would be no directional effect necessary.

However, should the loop be so located as to permit turning, both leads may be brought down to the set and real directional effect obtained. The loop will work a good deal better placed outdoors than when located inside.

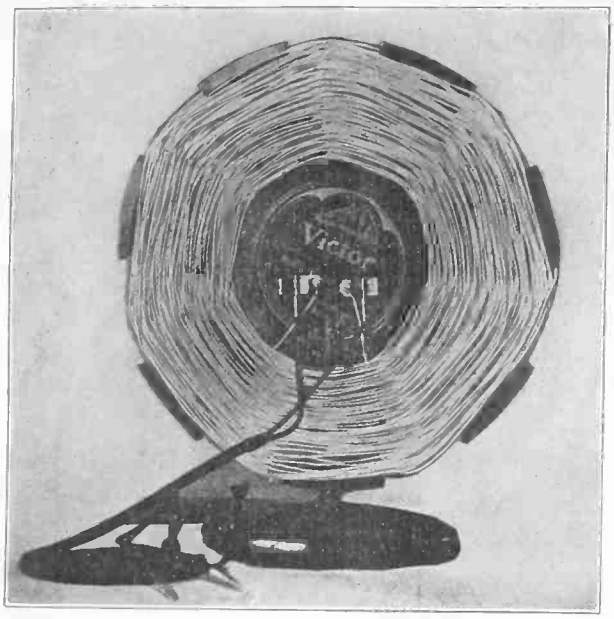
A very beneficial effect was noticed in some recent experiments with loops, described in an article by Herman Bernard in the September 6 issue of RADIO WORLD. The loop was connected in series with the regular antenna and provided with a short circuiting switch. The circuit used was regenerative. With the loop shorted out the set emitted energy, as observed from another set close by. With the switch out and the loop in series with the antenna, the radiation was greatly cut down. The loop acts as an absorber when used in this manner.

It is always better to tune a loop with a variable condenser, no matter where the loop is placed.

Making a Honeycomb Panel Look Normal

MANY experimenters are continually changing around the location of the instruments in their sets with the result that the average experimenter's panel looks like a honeycomb. These holes in the panel may be filled in a very simple manner and at very little or no cost. For panels with a mahogany finish fill the holes with the melted material from the top of a discarded B battery. For black panels use melted tar, or better still use the material from the top of a discarded A dry cell.

Winding Described in Photographs



(By Radio World Staff Photographer)

FIG. 5—The completed phonograph record spider-web loop. For convenience in connecting, two Fahnestock clips are fastened to the center of the record with machine screws and nuts. A single phone cord connects the spider-web to the set. The whole is mounted on a supporting base, and as the loop is rather light it is easily turned in any direction desired. It might be advisable to attach an extending arm to the loop to avoid capacity effects when turning the loop by hand. A fifteenth inch length of hard rubber or wooden dowel fastened to the center of the record with a couple of screws will be sufficient for the purpose. When the loops are in operation, try switching the leads on the record, as sometimes loops work better with the beginning of the winding going to the grid of the first tube.

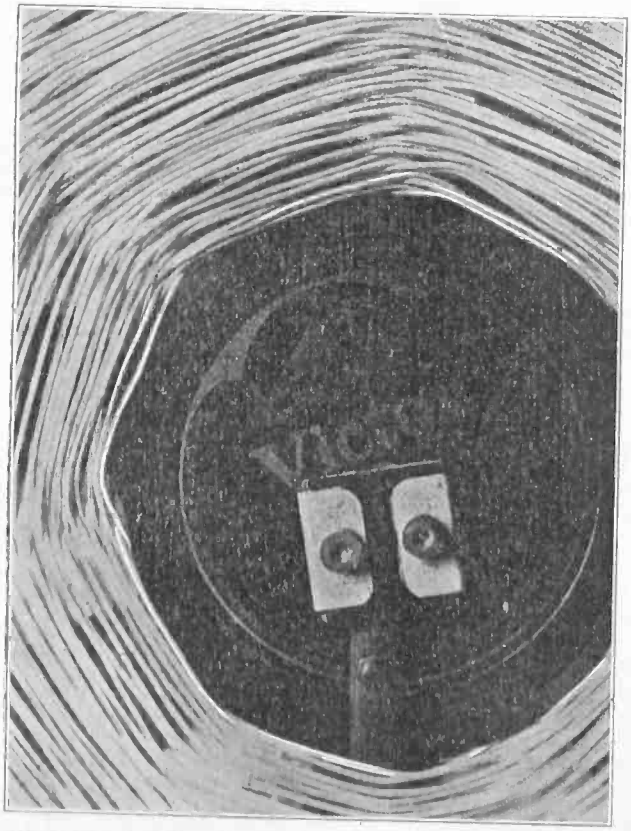
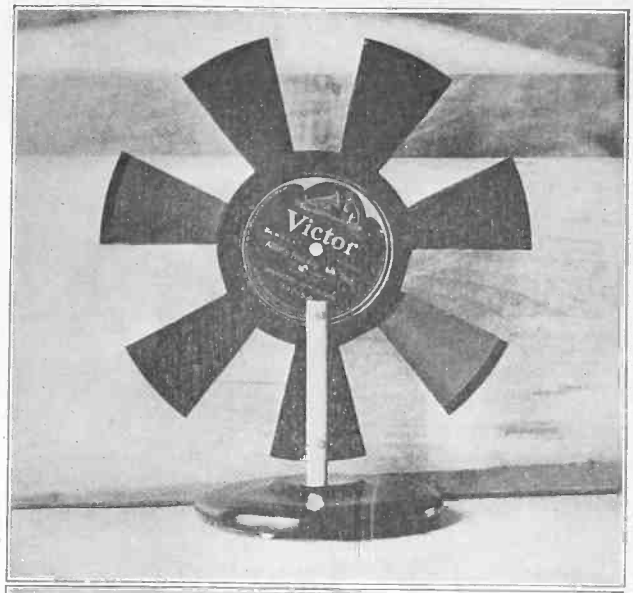
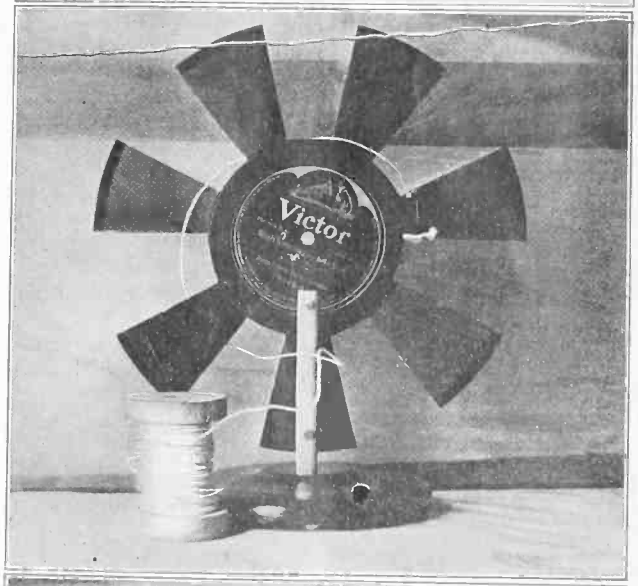


FIG. 6—The other side of the completed spider-web loop. The small fixed condenser (.00001 mfd.) is shunted across the loop terminals. This increases the effective wavelength of the loop. Different size condensers should be tried and the loop thus experimented with until the right capacity is found for the set used. Sometimes no condenser is needed, the capacity in the phone cord proving high enough. A good stunt would be to mount a low-loss 11-plate condenser onto the center of the record and do the antenna tuning with it there.





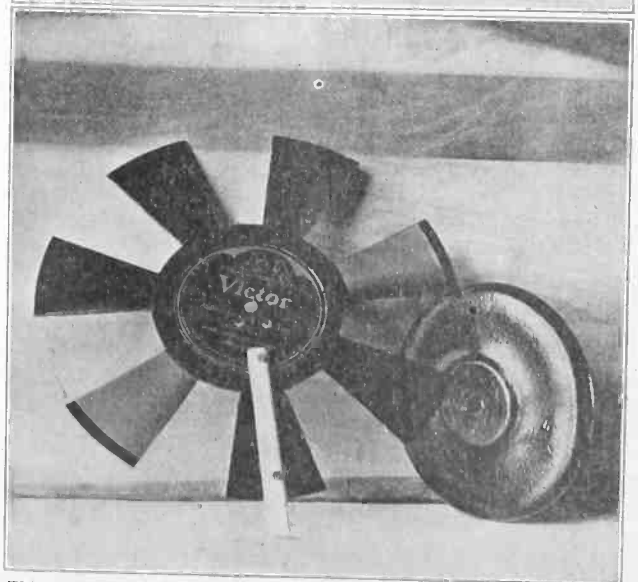


FIG. 2 (bottom)—The record after cutting on the white lines. Two small holes are made with a No. 27 drill near the center holes of the record for the binding posts and condenser. Fig. 3 (top)—How to mount the cut record on the stand with the supporting stick. Fig. 4 (center photo)—The wire is wound over one spoke and under the next, progressing around the circle.

A Low Loss Three Circuit Tuner

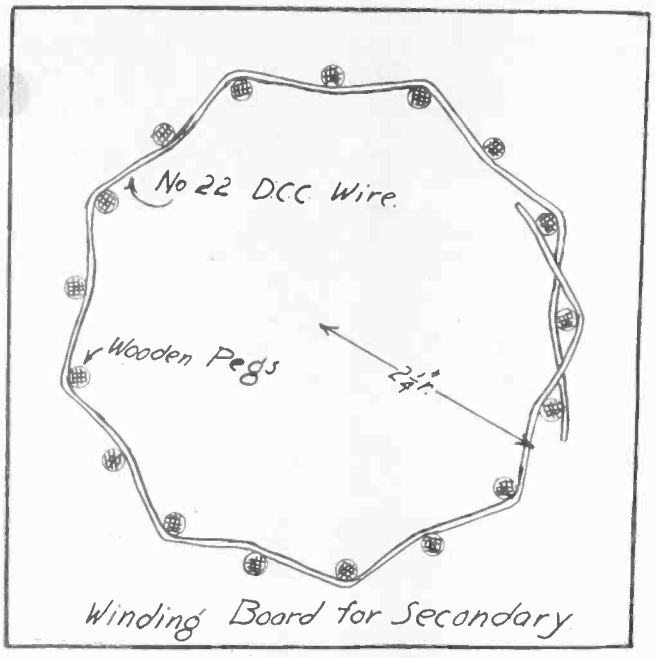


FIG. 1—A wooden block, 6 inches square, is used as the base for the winding form in making the secondary. Draw a circle, 4½ or 5 inches in diameter, and mark off 17 points as shown. Insert wooden rods, called dowels, in a vertical position, i. e., at right angles to the base, and in and out of these uprights wind the coil. Then apply collodion to the completed winding, removing the dowels. The coil is then self-supporting.

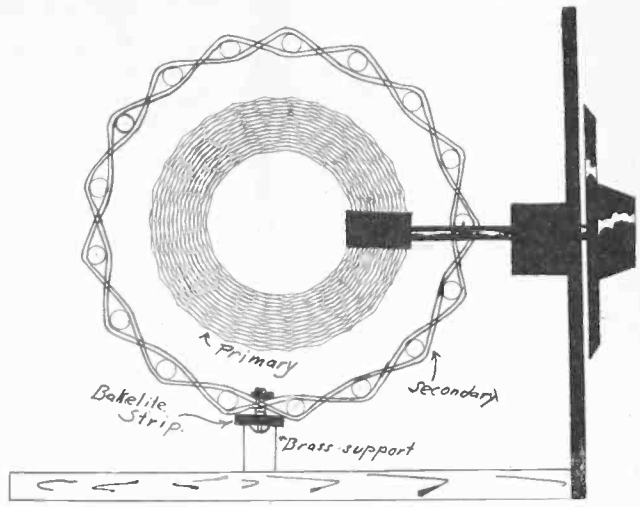


FIG. 2—Side view of the primary and secondary of low-loss coupler for the 3-circuit tuner, i. e., the view obtained when looking from one end of the 7 x 12 inch panel. The baseboard is at bottom. Notice that the primary is variable, rotated from the dial. This is unusual in a 3-circuit tuner and increases efficiency. The primary is nearer to you than the secondary. See Fig. 3 for view of the completed tuner.

By Neal Fitzalan

THIS week, in my series of articles on low-loss radio receivers, I come to the 3-circuit tuner. The diagrams show the construction of a 3-circuit tuner which is most efficient. When making this be sure to follow instruction closely, or you will not have a low-loss tuner.

It will be found that when this tuner is substituted for your present tuner, selectivity will be greatly improved and the sensitiveness of the receiver will be increased an amount quivalent to that obtained when one or two tubes have been added to the receiver. It is hard to believe what a great difference a low-loss tuner will make in a set.

The first thing which should be made is the secondary. A heavy block of wood, about 6″ square is needed. Draw a 4½″ or 5″ circle on this, and with your compass mark this circle off into 17 or 19 equal divisions. Drill holes on the markings and put short wooden rods into the holes. No. 22 double cotton covered wire is required for this coil. Wind it in and out of the pegs, as shown in Fig. 1. Forty turns are required. When it is wound paint the coil with collodion where the wires cross. Do not use shellac. Remove the pegs from the board, and the secondary is ready.

The primary and tickler are wound on wooden spider web forms, painted with collodion, and then removed from the forms. How this is done I explained in article on tuned RF transformers in the September 6 issue of RADIO WORLD. The primary of this tuner is aperiodic. Although it is shown in the drawings with a large number of turns, it has but 10 or 12 turns of the same wire that is used for the secondary.

Most tickler coils have entirely too many turns of wire in them. The number of turns used in this tuner is about 30. No. 24 DS wire is used for this coil.

The secondary coil is clamped between two strips of bakelite and fastened directly to the base with brass supports. A piece of bakelite is clamped to each of the other coils, and the shafts are run through these and fastened in place. They are supported so that they do not wobble, by a large piece of wood or other insulation, which is fastened to the panel, and through which the shafts run. These two coils are placed so that they are in the center of the secondary, and so that they are both parallel to the base they are about ¾″ apart inside the secondary. It should be noticed that the secondary of the coil is supported at least an inch from the base, and is placed at least an inch from the panel. It is better to allow 1½″ or 2″ provided that does not bring the coil too close to other solid material. The reason for this is that all possible insulation has been removed from the tuner and the act of bringing the instrument near the panel or base would introduce the losses which we have been trying to avoid.

The leads from the coils are made with flexible cord and are brought directly to the wiring of the set.

Use a great deal of care in the construction of this tuner, follow directions carefully, and you will have a tuner which will so improve your old receiver, or which which will give such wonderful results on your new one, that you will be far more than repaid for your work and trouble.

Wiring Directions

To construct the 3-circuit timer, mount the vario-coupler at left on the panel, centered 3″ from the panel side and 3½″ from bottom. Mount the variable condenser with center 7″ from center of the coupler shaft. Mount the rheostat at right of panel, near bottom. Mount the jack to right of and in line with the rheostat. For binding posts it is advisable to use a terminal strip, placed at rear of the baseboard, the leads going from the set to the strip and being carried from the strip through holes bored in the cabinet to their source—aerial, ground and batteries. This makes a neat job, keeping wired connections off the panel.

This set is regenerative and should be wired carefully to get about the best results possible, for, correctly made, it is perhaps the most effective 1-tube receiver yet devised.

1. Hold the baseboard against the panel, with 1″ free space at each end and on bottom of panel, i. e., 1″ leeway on two sides and bottom. Mark where

Wiring Great DX-Getting Set

the socket is to go, being sure it is as far back from the variable condenser as possible and leaving room for the grid condenser. Mark where the terminal strip is to go. This consists of a row of binding posts on a hard rubber strip. Put the baseboard on a table. Secure the socket and strip to the baseboard. Mount the grid condenser on the post of socket. Mount the baseboard on the panel with wood screws, through holes drilled in panel. Three screws are enough, equi-distant. Place the dials on the shafts. Mark the midpoint at top. Remove dials. With a fine drill barely start a hole. This is the indicator for dial settings. Remove dials.

2. Connect the + on the A battery direct to the F+ post on the socket. Connect the — on the A battery to one side of the rheostat, the other side of the rheostat going to the F— post on the socket. Connect the A— and B—. That completes the A battery wiring.

3. Connect the beginning of L2 (the secondary) to the stator plates of the variable condenser C1 and to the open side of the grid condenser. Connect the end of L2 to the rotor or movable plates of C1 and to the A+. (If a 200 or 300 tube is used, this grid return is to the A— instead.)

4. Connect the beginning of L3 to the P post of the socket, i. e., the plate, the end going to one of the jack springs. The other jack spring should be joined to the B+. (Instead of a jack, phones are shown in the diagram).

5. Connect the aerial to the beginning of L1 and the ground to the end of L1. It is optional to join the ground also with the end of L2 and sometimes improves results. But the ground connection to L1 still remains.

6. Disconnect the B+ wire at the battery. Insert the tube in the socket. Turn on the rheostat. If the tube lights, connect the B+ line to the B battery as before. If the tube does not light, check up your wiring for a short circuit and do NOT connect to the B battery + until you find the trouble, or you may blow out your tube.

Mounting Dials

Place the two dials on the two shafts. Tighten the set screws, but not firmly. On the condenser dial see that the plates are in mesh, that is, the rotating plates are completely inside the stationary plates. Now hold them there and turn the dial so that it reads at maximum (usually 100; sometimes 180, depending on kind of dial used). Fasten the set screw securely. Go through the same process for the coupler dial. The maximum reading should be obtained when the tickler (L3) and the secondary (L2) are parallel.

List of Parts

One 7" x 12" panel.....
One 7" x 12" cabinet.....
One baseboard 6" x 10".....
One variocoupler as described (L1L2L3).....
One 23-plate variabe condenser (C1).....
Two 4" dials.....
One tube .....
One socket to match.....
One grid condenser and leak (C3, R2).....
One pair of earphones.....
One jack plug.....
One vernier rheostat .....
One A battery .....
One B battery .....
One jack .....
150 to 200 feet of aerial wire, 50 feet No. 18 insulated lead-in wire, connecting wire, solder, lugs, binding posts and two (optional) fixed condensers, .001 mfd. (C2C4).

Note: If 199 or 299 tube is used, plate voltage should be 45 on detector; on all other tubes 22½. A battery is 4½ volts on 199 and 299; 1½ volts on 11 and 12 tubes and 6 volts on other tubes.

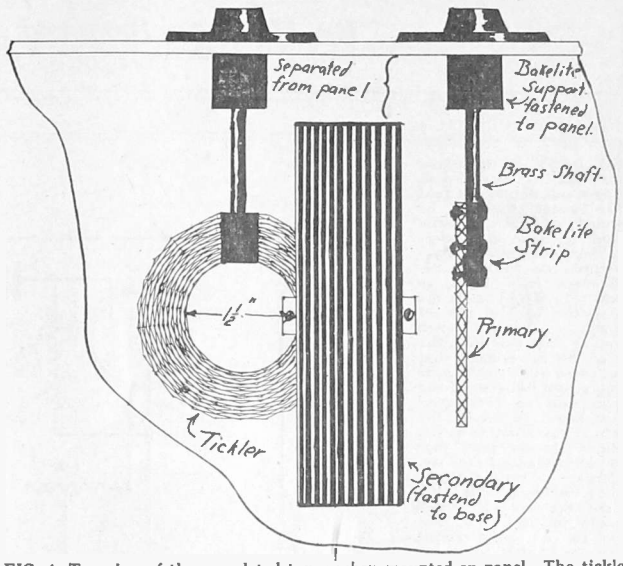
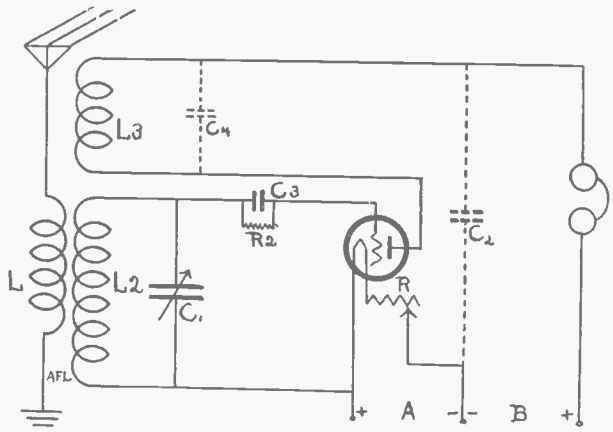


FIG. 4—Top view of the completed tuner when mounted on panel. The tickler or tertiary has 30 turns of No. 24 DCC wire. The heavy shaded symbol represents the secondary, suported on a wooden block. At right is the primary, 10 to 12 turns. Note that the primary is variable, just as is the tertiary.



CIRCUIT NETWORK of the 3-Circuit Tuner. L1L2L3 are the aperiodic primary, the tuned secondary and the tertiary or tickler of the variocoupler. (L1 is marked just L in diagram.) C1 is a 23-plate variable condenser, C2 an optional by-pass condenser, .001 mfd.; C3 the grid condenser, .00025 mfd., with grid leak (R2) mounted thereon; C4 is an optional fixed condenser, .00025 or .001, in case enough regeneration is not obtained otherwise. R is the rheostat and should be vernier, preferably of the compression or carbon disc type. A variable grid leak is recommended, as the resistance affects regeneration, and adjustment will clear up mushy signals from DX stations. This circuit is extremely selective, gets DX with great success and produces good tone quality and volume. The tube may be any kind except Sodion, because Sodion won't regenerate .

Tuning

The tuning is done exclusively with the dial on the variable condenser. The other dial controls regeneration, hence volume. The rheostat plays its part in regeneration, but is not critical after the correct rheostat setting is found. Set the coupler dial at about 20 to 30, light the tube, and turn the wavelength dial (on the condenser). When a station is heard, slowly increase the coupling of the coupler by turning to higher numbers. When good volume is reached, stop. Do not try for great volume or force the tube or the regeneration. That causes distortion and radiation and careful tuning avoids both.

The same stations always will come in at the same setting of the condenser dial at right. The setting of the coupler dial at left will vary.

A Real DX Set on 5" x 5" Panel

By Herman Bernard

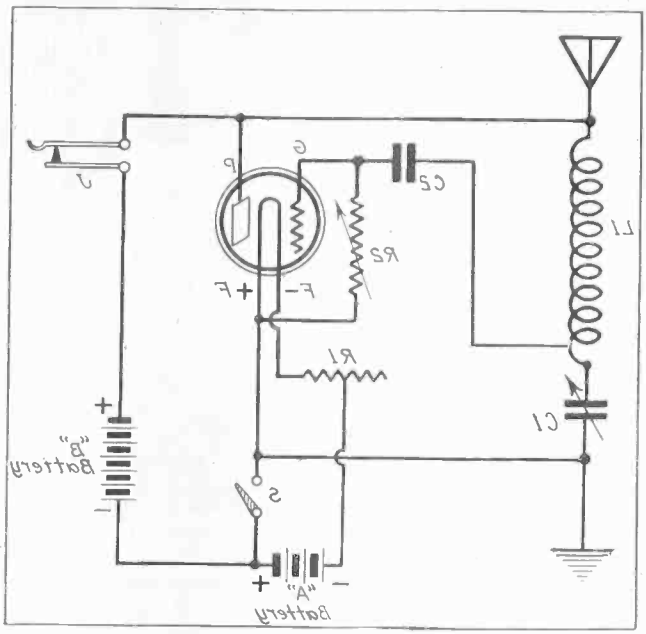
THE 1-tube, 1-dial set shown in Fig. 1 is selective enough for all ordinary needs, produces fine tone quality and volume and is a real DX-getter. It is constructed on a 5" x 5" panel. The use of a 4" dial is advisable, because large dials make tuning easier, particularly on a 1-dial set.

The coil used is wound on a spider-web form. Fifty feet of No. 20 double cotton covered wire may be used in conjunction with a 15 or 17-plate low-loss variable condenser to cover the radiocast band.

Some difficulty occasionally arises because experimenters making sets find that the coil and condenser combination described by a text writer does not cover the band, the high wavelength stations coming in near the center of the dial, around 50, or the low ones registering such dial setting. This is due to the disparity between the experimenter's condenser with that used by the author. If the condenser you intend to use is not low-loss you may need 23 plates. Often a 23-plate condenser, converted into a low-loss one, which can be done easily enough, covers the entire band, and much more successfuly, when only 13 or 15 plates remain. That is because when the insulation is reduced the narrowing effect goes with it. Through the insulation the precious feeble impulses find an easy path of escape and the whole philosophy of low-loss instruments in radio is to safeguard against unnecessary losses. The complete elimination of losses is impossible in a coil and very difficult in a condenser, but that is no excuse for tolerating undue losses. Those desiring to convert their condensers into the low-loss type should read the article by Dennis J. O'Flaherty, published in the July 5 issue of RADIO WORLD.

It is advisable in constructing the set presented herewith to wind fifty feet of No. 20 DCC wire and if that proves too much to remove turns until the highest wavelength station comes in around 90. Assuming that this course is to be followed, use the template (Fig. 2) for tracing the spider-web form. Then paste some tracing paper on a square piece of cardboard and cut the cardboard to the shape of the form. Leave one foot of slack wire for later connections, then start winding the wire at the hub in and out of the arms or spokes of the form. Be sure to wind the wire tight. DCC wire is preferable because it is less likely to lose its insulation and the thickness of the insulation gives just the right dielectric for best inductance. You will find that the succeeding turns will keep the beginning terminal of the wire snugly in place. When you come to the end of the winding leave another foot of slack wire. The point a foot from the end of the wire, that is, where the winding terminates, may be secured by passing the excess foot of wire under the second preceding winding and out to the end again, being threaded under the wire at the end loop. Now with linen thread, which is better than cord because of its fortunate indifference to moisture, bind the winding to prevent spreading. Thirteen pieces of thread may be used, one piece passed around the winding at each of the apertures between spokes. The thread is knotted at the outer circumference of the

SO EASY is the construction of the 1-dial, single-coil, 1-tube set that the artist thought he would add just a little kink to make the undertaking still more interesting. So he drew the diagram from right to left (Fig. 1). That is the way the back of the set looks, anyway, when you're constructing the set. So he decided that an extra kink was a good thing and he lettered the constants so they read backward. Even so, the whole construction is ten times simpler than that of any other tube set. Perhaps he thought that by having his little joke the signals would come in backward, but not so. L1 is the special Dynocoil, easy to make, and described in the text. C1 is a 17-plate variable low-loss condenser. C2 is the grid condenser. R2 is a vernier rheostat, S a battery switch, push-pull or toggle variety; J a single-circuit jack. If 199 or 299 tube is used the plate voltage should be 45.



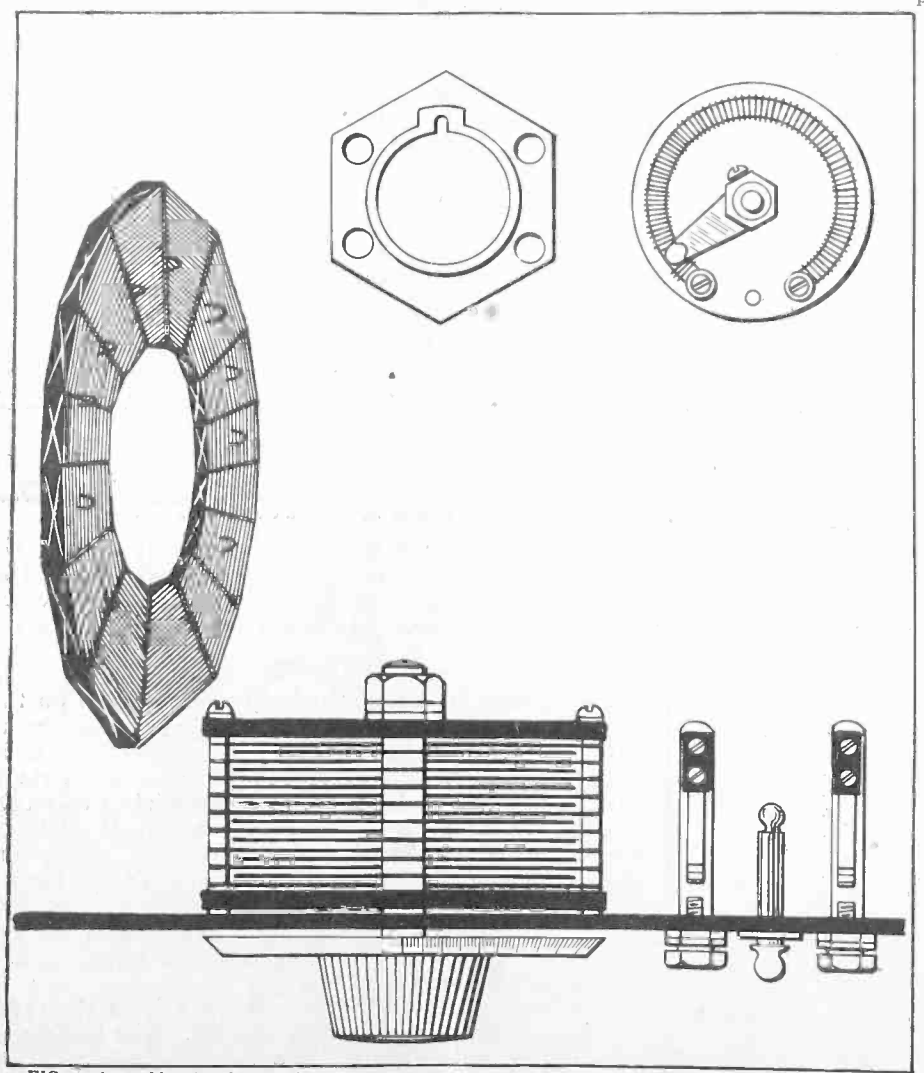


FIG. 4—Assembly plan for 1-dial DX set, showing variable condenser with coil mounted thereon; rheostat, tube etc. This plan may be followed exactly, except that the switch would be on the rheostat should the type used by the author be selected. The baseboard is 5" wide 6" deep, if no cabinet is to be used. Otherwise 4¼" x 5" so that the panel can slide in the cabinet easily.

Winding the Low-Loss Dynocoil

A Highly Efficient Tuner

winding. You need have no fear whatever that the coil thus made is not sufficiently rigid. Moreover you will have a coil as nearly no-loss as it is possible to make. The ideal coil would be one without any insulation whatever—no cotton or silk or other covering—and suspended in mid-air, attached to nothing. As the exacting laws of nature render this impossible, the next best thing is a coil that uses no insulation except that necessary to separate windings, and minimum insulation where connection is made. This coil devised by RADIO WORLD and known as the Dynocoil, is better than one wound on a hard rubber or like tube, where the tube affords the path of escape that radio engineers are strongly determined shall be avoided.

You may wonder how the excess wire, if any, is to be removed, now that all the wire is bound with linen thread. That problem will be discussed later, as it is most easily soluble after the set is made.

Try to keep the turns of wire as nearly parallel as possible. If this is done while you are engaged in the winding, the process is simplified. Just push the turns with your finger if they show any tendency to separate. But probably you will not encounter any such difficulty. That relief is the fruit of tight winding. So much depends on the coil that you should wind it very carefully.

If it is well-made it will do wonders on DX work and will last a very long time.

Now take your 5" x 5" panel. It may be difficult to purchase a panel of this size. If so, get the smallest size possible and cut it to these measurements with a hacksaw. If preferable, leave the smallest size panel you can buy just the way it is and draw a line across the middle, parallel with top and bottom. Measure 5" from the left and draw a perpendicular line in pencil parallel with the side. When you come to the mounting of the variable condenser drill for the shaft center on the horizontal line, the same distance from the left-hand side as shown in the panel layout (Fig. 3).

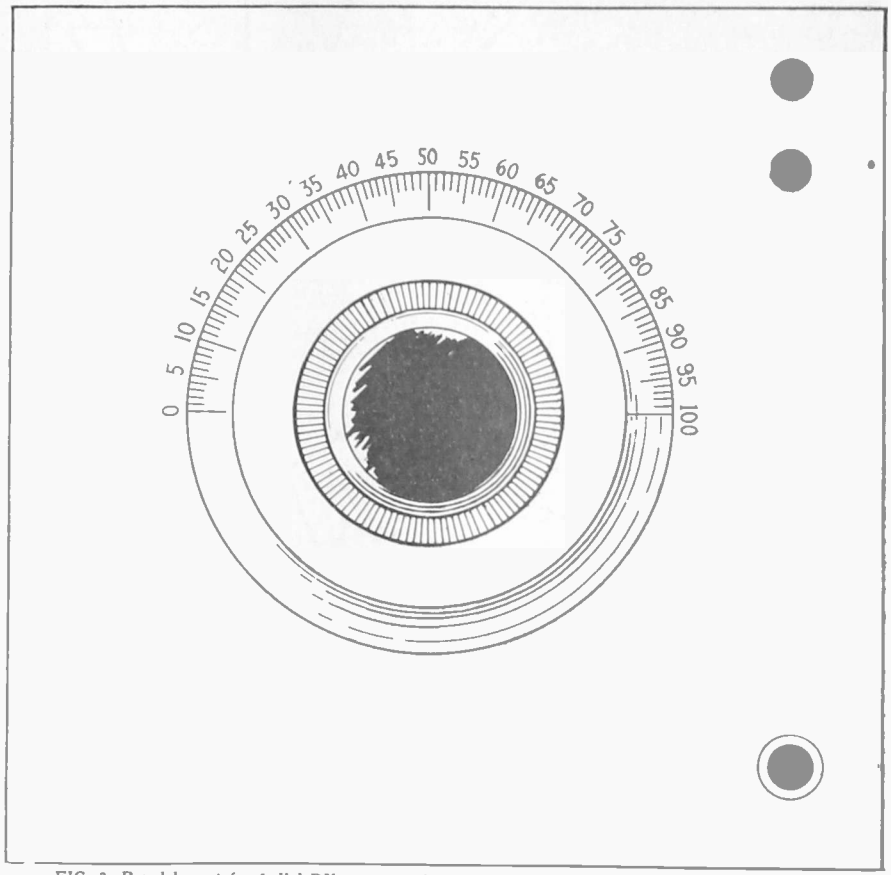


FIG. 3—Panel layout for 1-dial DX set, actual size. Use it as a template. The panel is 5" x 5"

Assuming that Fig. 3 is being followed, drill a ¼" center hole for the shaft of the variable condenser. Fig. 3 is printed in actual size, so the dimensions may be taken from the drawing. Use the template that comes with the condenser, for drilling the hole for the machine screws.

The variable condenser mounted, now place the baseboard against the panel, leaving ¼" free space at bottom if the set is to be put in a cabinet. The object is to permit the baseboard to clear the bottom of the panel cabinet, in case the cabinet is of the type that has a horizontal bottom strip for stopping the panel, It must not stop the baseboard. If no cabinet is to be used, and it is not vital for the success of the set that you have a cabinet, the baseboard may be mounted flush with the bottom of the panel. Thus panel bottom and baseboard bottom will be on the same level. Otherwise the set would tilt.

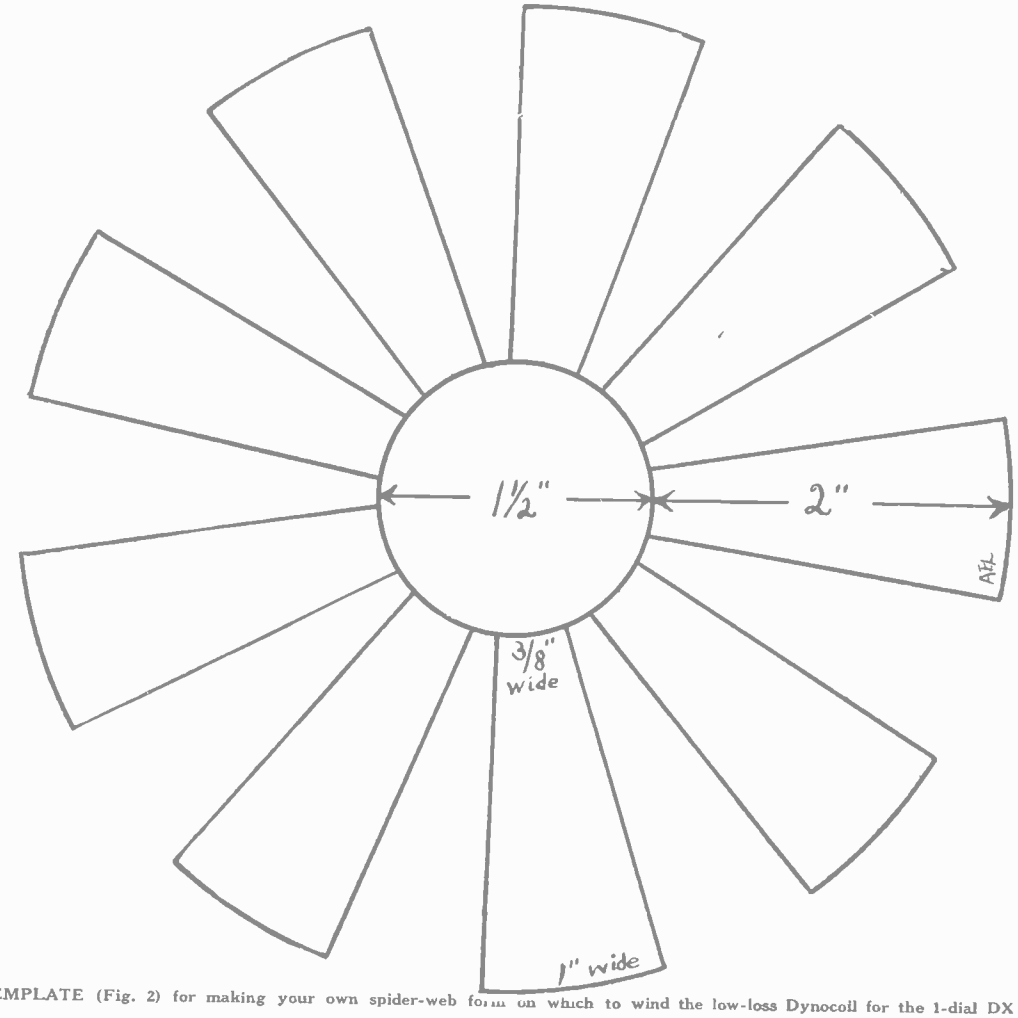
With the baseboard held against the panel in the position where the two are to be joined with woodscrews, mark off where the socket is to go and take care to provide room for the grid condenser. In many types of sockets the grid condenser may be mounted directly on the G post of the socket. This is true of the socket shown in the assembly plan (Fig. 4). In the set I built the 199 tube was used. Note that the grid and plate posts are diagonally opposite each other, instead of side by side. This is characteristic of the 199 tube. The 299 type is the same tube as the 199 and made by the same company, though these tubes are sold by distinct companies. If dry-cell tubes are to be used I advise 199 or 299 type or equal. However, the 11 and 12 types work well. The Sodion tube, because this is a regenerative set, will not do. The best tube to use is the 200 or 300 type, requiring a 6-volt storage battery, but consuming entirely too much filament current to be rated as economical. All things considered, the 201A or 301A tube is best, the 199 and 299 tying for second place and the 11 and 12 tubes sharing third place. I speak of these tubes on the basis of their general run, though sometimes an 11 or 12 tube will be better than a 201A. I find the greatest variation in the 199 and 299 class. However, this is the tube I use, as I make sure to use one that is an excellent detector. When you do this you have a tube that is hard to beat.

Mount the socket on the baseboard and the grid condensed on the G post of the socket. If the socket binding post has a screw too wide to permit passing through the hole in the grid condenser, solder a piece of stiff wire, such as No. 14 round bare wire, to one side of the grid condenser and bend the wire at right angles. Loop the wire so that the loop may be passed onto the binding post, or solder that end of the wire to a lug.

Suit yourself as to binding posts on the panel. If you object to having wires attached at the front panel, and many experimenters do object, then use a terminal strip. This consists of hard rubber, 7" x 1½", with a row of binding posts on it, usually designated. This should be mounted on the baseboard, preferably at right, in the rear. If a cabinet is used, holes are drilled so that the wires from the strip may go to aerial, ground and batteries. If no strip is used, fasten binding posts to the front panel at points as near as possible to the leads to which they connect. The aerial and ground posts would be at left, preferably near the top of the panel, the aerial post at the higher position and the ground post under it.

Fasten the baseboard to the panel by drilling three holes through the panel, on the same line at a distance from the bottom permitting the screws to enter the middle of the baseboard front. The distance may be determined by measuring the thickness of the baseboard and drilling the holes one-half that distance from the bottom of the panel, should no cabinet be used. If a cabinet is used, add ¼" to one-half the thickness of the baseboard. The next step is to mount the coil. A brass angle is secured to the back of the variable condenser. If no angle is available, use a stiff piece of insulated copper wire. Bus bar will do, but cover it with spaghetti. I prefer a brass angle. One may be purchased for a few cents in a hardware store. Get one with 1½" arms, or thereabouts, with two holes on each arm. Then you can cut a small piece of hard rubber, say 1" x 3", boring two holes in it at the narrow bottom to

Matching the Coil and Condenser



TEMPLATE (Fig. 2) for making your own spider-web form on which to wind the low-loss Dynocoil for the 1-dial DX set.

coincide with the holes in the angle arm. Fasten the angle to the condenser so that the arm attached to the condenser is horizontal and the other arm points toward the front of the panel. Perhaps your condenser is not a deep one and the coil, if mounted this way, would come in contact with the panel. Always be sure to keep the coil at least 1½" away from the panel. Your solution is easy. Remove the angle and mount it on its reverse side, so that the one arm is still horizontal, but the other points to the rear of the panel. The hard rubber block will be upright. Two more holes, drilled where the inner and outer circumferences of the coil are, will afford means of passing linen thread through the hard rubber block and around the coil, keeping the coil in place. The coil is at right angles to the panel. However, if there is room it is even permissible to turn the angle bar so that the coil is atop the condenser, and parallel with the baseboard. In such an instance be sure that the variable condenser's plates, when entirely out of mesh, do not come too close to the coil, certainly not touch it. There is a wide latitude in this mounting and any manner that best suits the convenience of the experimenter will do.

Wiring Directions

1. Connect the + post of the A battery to the F+ post on the socket, to the ground and to the rotor or movable plates of the variable condenser C1. Mount the variable grid leak between the G and F posts on the socket. Connect the A— to one side of the rheostat and join the other side of the rheostat to the F— post on the socket. Connect the A+ and the B—. If the assembly plan shown in Fig. 4 is used with a battery switch interrupt the A+ lead between battery and socket. The socket side of the remaining wire goes to one of the posts of the switch and the other switch post is connected to the A+ on the battery.

2. Connect the beginning of the coil to the aerial, to the plate or P post on the socket, and to one of the springs of the jack. For clarity the jack appears as two separate tips in the assembly layout (Fig. 5). The other spring goes to the B battery +.

3. Connect the end of the coil to the stator plates of C1 and to the unconnected side of the variable grid condenser C2.

Be sure that you mount the grid leak correctly—that is, connect it between binding post and binding post. The custom of putting the cartridge type leak in the clips on fixed grid condensers leads some experimenter to assume that the leak when placed across the line goes to the coil side of the grid condenser. If this misapprehension prevails the ste will not function.

The grid return is metallically to the F+ in this circuit, as you can see by following the grid line from the G post of the socket across the leak to F+. If a 200 or 300 tube or other soft detector is used this connection should be to the A—. See the instruction sheet supplied with the tube you buy.

There is also a supplementary and capacitatively coupled grid return, traceable from the grid across the grid condenser to the end of the coil and through the coil into the plate. It is the metallic grid return that necessitates nice adjustment of the grid capacity, leak and rheostat. You will be surprised to find the improvement in the quality of DX reception encountered by variation of the grid condenser and grid leak. In my set I used an Amplex Grid-denser and a Turnit variable grid leak, ¼ to 5 magaohms.

For local reception the rheostat need be set only once and the switch need only be pulled out to make the set function properly on stations, but on DX work the rheostat will have to be adjusted. The switch makes constant turning of the rheostat knob unnecessary to light or extinguish the tube. I used a Filkostat, the new model that has battery switch attached.

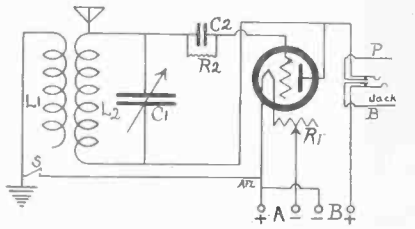
Now as to covering the radiocast band. Try out the set. Light the tube. Tune in a station by rotating the dial. If the station of highest wavelength that you expect or desire to reach would be relatively far down in the dial reading, say around 55 or 60, you have too much wire on the coil. If you try out the set when the highest wave station is on the air you can make your adjustment properly right then. If a 455-meter station, or thereabouts, comes in around 50 you may safely decide your balance between capacity and inductance is all right. If it comes in around 30 you have too much inductance. If by any chance the readings are too high, instead of too low, you may balance your circuit by putting a small fixed condenser across the variable condenser. This connection is in parallel, that is, one side of the fixed condenser would go to the stator plates and one to the rotor plates. Under the plan I outline, however, you will not encounter this difficulty unless you use, say, an 11-plate variable condenser, and more-

(*Concluded on page* 30)

The Radio University

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

I have hooked up the 1-dial, 1-tube set described by Herman Bernard in the August 23 issue of RADIO WORLD *and it is a wonder. I added two stages of AF. I hear a buzz like an open circuit. (I wired the set for regeneration without the*



SOLODIAL CIRCUIT (Fig. 33) with grid return to the plate, answering Dr. F. E. Bowman's query.

switch).—Dr. F. E. Bowman, 17 Prospect St., Cambridge, Mass.

Fig. 33 shows a circuit diagram with a slight change from the original and which should get rid of any hum you may hear. The aerial goes to the grid and the grid return is to the plate.

* * *

1—Will National condensers, .00035 mfd., cover the radiocasting wavelength range if used on the low-loss Neutrodyne coils (the Magnadyne circuit, RADIO WORLD *for August 16 and 30), or will the secondary windings have to be increased, and if so, how much? 2—Will these coils wound the same as specified in the August 23 issue be suitable to use on a Boston American Super (4 tubes), and could I expect an increase in DX and more volume on locals?—J. W. Rankin, 565 Putnam Ave., Cambridge, Mass.*

1—Yes, the condensers you mention are entirely suitable for use with the Dynocoils. No change in the windings is necessary. 2—Not being familiar with the Boston American circuit, it is impossible to say whether or not the coils will do. If you send in the circuit with constants we will give you the right dimensions to construct the proper Dynocoil.

* * *

With reference to your article in the July 19 issue of RADIO WORLD, *kindly publish a sketch giving more definite illustration of the method of arranging the wire on the ideal loop. It is not quite clear just how far apart the outer and inner turns are to be spaced.—B. O. Salter, 190 University Avenue, Toronto, Can.*

A complete descriptive article on the simplified ideal loop with drawings appears in RADIO WORLD for August 30. That article will tell you in detail just how to build and wind the loop.

* * *

I am now using a 3-coil regenerative set and when tuning it in causes the greatest disturbances in my neighbors' sets. Is there anything that can be done to check this?—F. Haas, 123 Southern Ave., Baltimore, Md.

The reason that the set causes the disturbance is that you have not yet learned to tune it properly. Instead of tuning in the high-pitched whistle from the transmitting station you should adjust the plate coil so that there is no hissing sound or click present in the ear phones. Then tune the coupler and condensers until the signal is heard, after which you may tune up the plate coil until the signal is loudest without causing the circuit to go into oscillation. Oscillation is brought about by turning the plate coil so far that a click and then a hissing sound is heard. It is then that the receiving set radiates and disturbs other listeners.

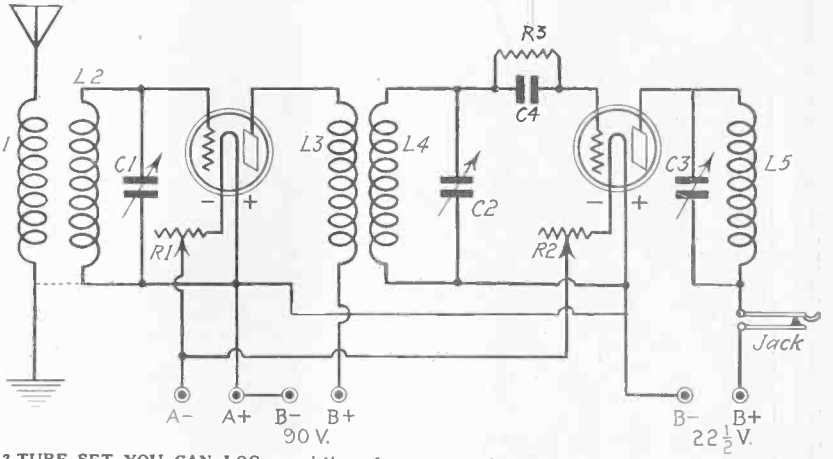
* * *

I wish to build N. N. Bernstein's Dynoflex set as described in RADIO WORLD *for August 9, but he stipulates variable condensers of .00035 mfd. capacity and I wish to use two Acme low-loss .0005 mfd. condensers, which I have on hand. Will it be possible to use these condensers without making any change in wiring the coils? If not, what changes will I have to make in the instructions as given? Will this set, if properly constructed, give good loud speaker reception at distances up to about 1,000 miles under favorable conditions, if one stage of straight AF amplification is added?—Earnest L. Brudos, Lake City, S. D.*

You may use the condensers you have on hand now, and the set will work just as well, with the exception, however, that the tuning will be sharper than when using the .00035 mfd. condensers. The efficiency of the set will in no way be lessened by their use. With one stage of straight audio added, this circuit is sure to give excellent loud speaker results on local and even distant stations in the winter months. You can expect excellent DX with it.

In regard to a 1-tube set you can log, published in RADIO WORLD, *issue of July 12, would it be possible to add two stages of radio and two of audio? —Clyde Newton, Box 353, Conrad, Ia.*

It is inadvisable to add two stages of radio-frequency amplification to a regenerative detector because of the uncontrollable oscillation. However, one stage of radio-frequency is highly desirable and efficient. Fig. 34 is the circuit network on the 1-tube loggable set, preceded by a stage of tuned radio-frequency amplification. Honeycomb coils are used for the inductances. L1 consists of 25 turns and L2 of 75 turns, the latter shunted by C1, a 17-plate low-loss variable, .00035 mfd. L1 and L2 are closely coupled. L3 is 25 turns, L4 is 75 turns, and L5 is 50 turns. L3, L4 and L5 are tied together with a piece of string and mounted on a hard rubber strip, which is affixed to the backs of condensers C2 C3, the latter being 13 or 15 plates, low-loss. The ground may be connected to the end of L2 or this connection, shown by a dotted line, may be omitted. Try both ways and select the one that works better. The two stages of audio-frequency are added in standard fashion. The end of L5 and the B plus 22½ volts go respectively to the P and B posts of the first audio-frequency transformer.



A 2-TUBE SET YOU CAN LOG, consisting of one stage of tuned RF and a 3-circuit regenerative detector (Fig. 34). Honeycomb coils are used. The diagram is published in response to the query of Clyde Newton, Box 353, Conrad, Ia.

A detailed description of adding two stages of AF without any extra controls to the set was published in the August 30 issue of RADIO WORLD.

WHAT

do you think of the advance programs published in RADIO WORLD? Are they serviceable to you? If not, why not? If so, how much? YOUR views will be appreciated. Mail replies before September 15, 1924.

Address PROGRAM EDITOR, Radio World, 1493 Broadway, New York City.

An autographed photo of "Roxy" (S. A. Rothafel, WEAF) will be sent to everyone replying.

RADIO WORLD'S

Radiocast University

Questions and Answers On the Air Every Wednesday Evening at WLS, the Sears-Roebuck Station, Chicago — Department Conducted by Mat H. Friedman, RADIO WORLD'S *Chicago Representative.*

Will you please furnish me with a reliable 1-tube circuit which will enable me to get good local results and some distance? Also the set should be able to tube sharp.—Hugh Doherty, 5633 South Elizabeth St., Chicago.

For an excellent 1-tube set you are recommended to build the Dynoflex, complete constructional data for which is given by N. N. Bernstein, Technical Editor, in RADIO WORLD for August 9. Many fans have built this circuit with great success with it. Loud speaker volume is obtained on stations 350 miles away, although only one tube is used. This circuit is also very selective so you will be able to tune out any undesired station.

* * *

Please give your opinion of a circuit comprised of two stages of transformer-coupled radio-frequency amplification, detector, and two stages of audio. This circuit uses a variocoupler for tuning, two variable condensers and five tubes. Can I use this set with a loop antenna? Also, how is this hook-up for DX reception?—Charles D. Rollins, 836 Storley Ave., Burlington, Wis.

The circuit you describe, although it apparently uses fixed RF transformers, is considered to be a very good one for local and DX reception. It will work well with a loop, but then the variocoupler will have to be taken out of the circuit and the loop placed across the grid tuning condenser. A method of using either loop or regular antenna by means of a double-circuit jack was explained in the Radio University department in RADIO WORLD, issue of June 21.

* * *

In regard to the Autoplex circuit featured quite a while ago in RADIO WORLD, *would basket-weave variometers be more efficient and satisfactory than the moulded bakelite type?—E. Wehmann, Little Falls, Ia.*

The basket-weave type of variometer is considered to be much more efficient than the kind wound on moulded forms because the losses in the former have been reduced to a minimum by the elimination of supporting material.

THE SUPERDYNE PRINCIPLE in a 3-Tube Set, by Lester Hutter. Complete construction data and diagrams, Aug. 16 issue, 15 cents, or start your subscription with that number. Radio World, 1493 Broadway, N. Y. C.

Join RADIO WORLD'S University Club

And Get Full Question and Answer Service for the Coming 52 Weeks.

RADIO WORLD, 1493 Broadway, New York City:

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

Name .....

Street .....

City and State .....

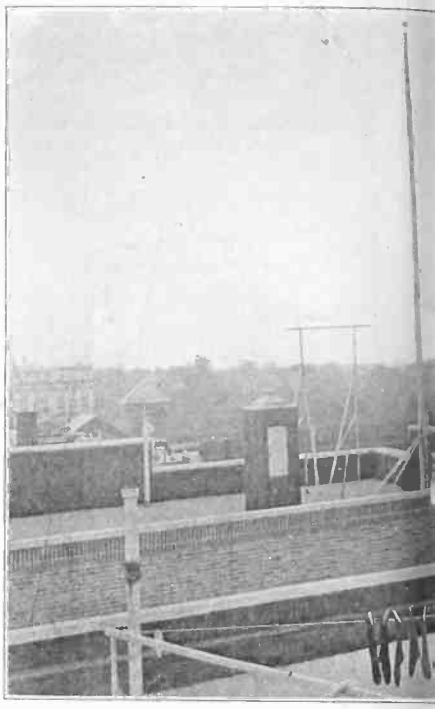
By Air Mail—Comforts — Benevolen

(Kadel & Herbert)

RADIO waves travel in the air. This radio set came in via the air, all the way from Los Angeles to New York. Miss Catherine O'Connell of New York ordered the set from a firm in Los Angeles and paid $69.46 Aero Mail charges.

(International Newsreel)

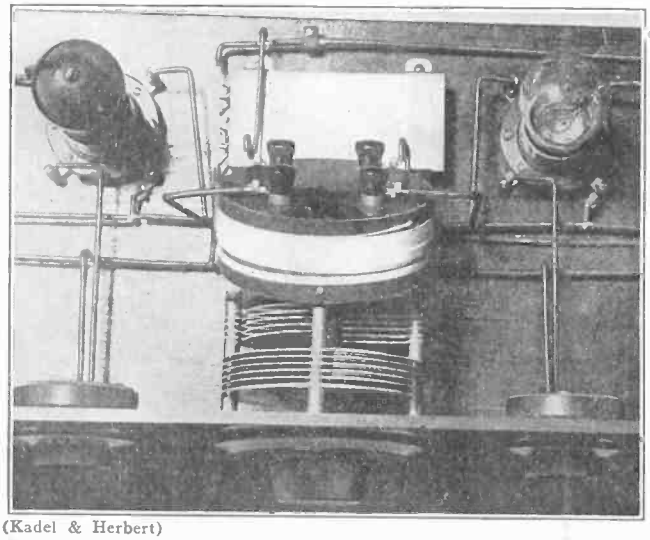
"ALL modern improvements and comforts" now includes a radio receiver in each hotel room. Margery Weinzart is all set for the Sandman's good night story. The box with the dial in the center that you see over the head of the bed is the individual tuning device placed in each room of the new Nassau Hotel, Long Island. Thus, each guest can tune in which ever program he likes best.



(Kadel & Herbert)

MODERN apartment ho
venience of the tenants.
Bronx, N. Y. C., has ste
occupants of the apartme
amount of space is allo
his aerial wire to the st
on ea

A FEAT—Two-way conversation between an army plane and persons on the ground was accomplished at night at Palisades Park, N. J. Lieut. Howard Brandt (left) radiocast from the plane, 4,000 feet up. Lieut. S. M. Connell (right) was the pilot.

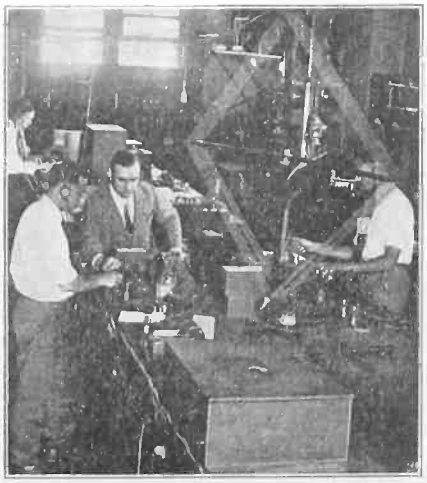


(Kadel & Herbert)

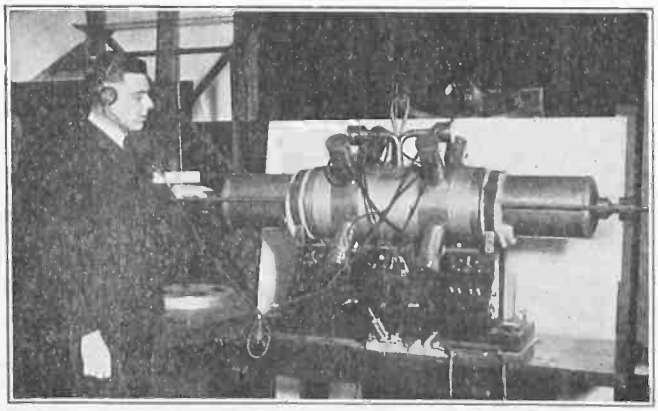
A NEW IDEA in placing the coils in tuned radio-frequency sets was developed by Walter S. Lemmon, of the Radio Club of America, who built the outfit shown in the photo. The angle is the thing. Mr. Lemmon found that by winding special coils and mounting them as shown the set was very stable.

(United)

THIS ANCIENT DRO
on far-off desert sands,
of Arab Sheiks. Tuning
pleasure, especially if
supports. Riding a ca
violent climax of a Jap



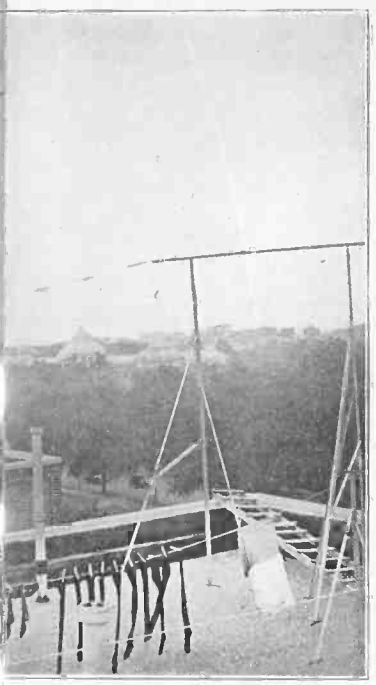
TRYING to reach Europe from N. Y. City College laboratory. (Kadel & Herbert)



(Miller)

E. L. LUKE, Chief Radio Electrician, U. S. N., demonstrating the Scotch Clariphone used for the elimination of static in radio reception by acoustics.

Landlord — Journey of a Signal

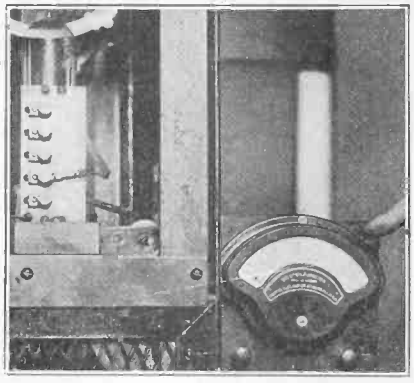


ve radio towers built on them for the con-
e row of houses on Mosholu Parkway in the
rts of uniform size on the roofs, so that the
l have ready-made antenna posts. A certain
h tenant and all he has to do is to attach
pieces. Two of these structures are erected
se. Benevolent landlord!

RY, used to leading a sedate and drowsy life
transports bathing beauties and radios instead
oard the humped back will not be fraught with
uum tubes are not mounted on soft rubber
th a park bench for a saddle feels like the
arthquake and sounds heard are often falsely
scribed to static.

(Kadel & Herbert)

THE FIRST STEP in sending out the voice over the air from the transmitting station is performed before the microphone. The artist does her part in much the same manner before the "mike" as before an audience. The voice acts upon the microphone, which in turn sends the electric impulses along to the speech amplifiers. The diaphragm of the microphone vibrates with the voice, changing its internal resistance constantly, thus allowing a fluctuating current of electricity to pass through it.

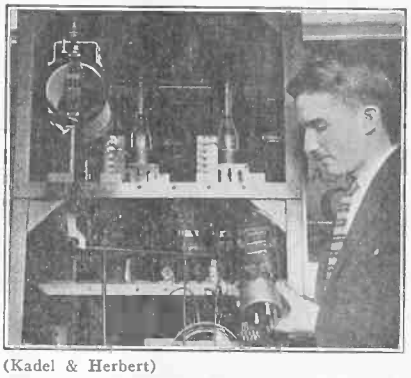


(Kadel & Herbert)

AFTER the singer's voice has left the speech amplifier, it is amplified still further by a 50-watt vacuum tube, and from there it goes to the transmitter. By means of the meter shown in this photograph it is possible to note any distortion in the outgoing signal, and of course the apparatus is immediately adjusted to correct the fault. The meters of the radio transmitting stations tell at a glance if anything is wrong. They are the watchdogs of the radio.

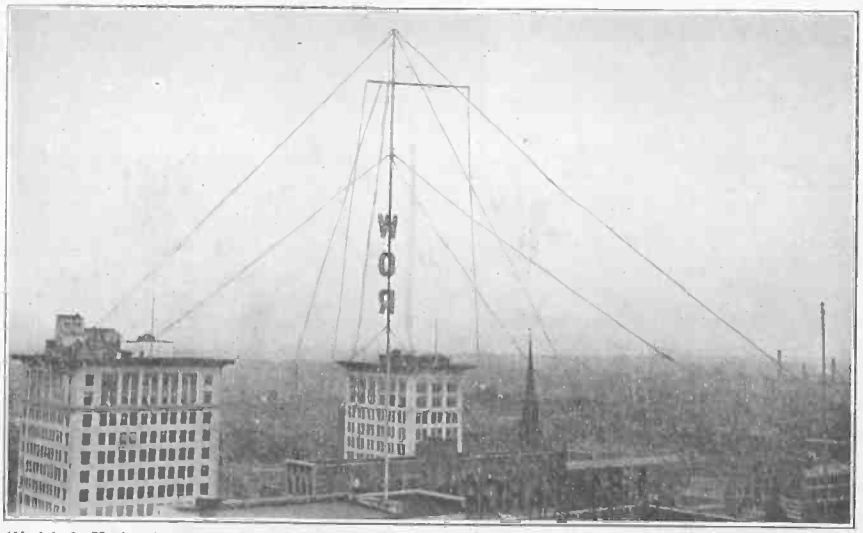
(Kadel & Herbert)

THE SECOND STEP of radiocasting is performed by the speech amplifier. After the singer's voice is picked up by the microphone, it is amplified many times before it enters the transmitting tube circuit. The knob that the engineer in the photo is turning regulates the speech amplifier. The knob controls amplification.



(Kadel & Herbert)

THE FOURTH STEP in the transmission of voice over the air is the passage of the singer's voice through the great 500-watt transmitting tubes, located on the upper shelf of the transmitter cabinet.



(Kadel & Herbert)

THE FIFTH AND LAST STEP of radiocasting is performed by the antenna wires which radiate the energy from the transmitting tubes into space. These waves are picked up by your own antenna wires and your receiving set does the rest.

RADIOCAST PROGRAMS

Thursday, September 11

WDAR, Philadelphia, 395m (760k), E. S. D. S. T.—11:45 A. M., daily almanac. 12 Noon, organ recital from the Stanley Theatre; Arcadia Cafe Concert Orchestra. 2-3 P. M., Arcadia Cafe Concert Orchestra. Artist recital from the Studio. 4:30 P. M., artist recital from the Studio, Magazine Corner. 5:45 P. M., sporting results and special announcements. 7:30 P. M., Dream Daddy with the boys and girls.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—6:05 P. M., dinner music, arranged by Harry Link. 6:45 P. M., agriculture, livestock and produce market reports. 7:00 P. M., Uncle Wip's bedtime stories and roll call for the children. 8:00 P. M., "Timely Talks to Motorists," talk by Gene Hogle. 8:15 P. M., special program by the Atlantic City Kiwanis Club, direction of Mr. E. M. Spence. 8:45 P. M., "What the Wild Waves Are Saying." 8:50 P. M., performance of Murphy's Minstrels, direction of Frank Elliott. 9:30 P. M., concert by Vessella's Concert Band, Oreste Vessella, conductor. 10:00 P. M., dance music by Bob Leman's Dance Orchestra.

WAAM, Newark, N. J., 360m (830k), E. S. D. S. T.—11:30 A. M., American Radio Relay League's latest bulletin on items of interest to amateur radio. 7:30 P. M., music while you dine by Ray Southwick's Commodore Orchestra. 8:00 P. M., WAAM popular pianist in a varied program of piano selections. 8:30 P. M., Harry Knox and his radio entertainers. 9:45 P. M., Catello's Syncopators in their hour dance program of Zippy Jazz.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—7:00 A. M., WOR Morning Gym Class, direction of Arthur E. Bagley. 6:15 P. M., Albert E. Sonn, radio department, "Radio for the Layman." 6:30 P. M., "Music While You Dine"—Tom Cooper's Country Club Orchestra. 7:20 P. M., resume of the day's sports with "Jolly Bill" Steinke.

WLW, Cincinnati, O., 423m (710k), C. S. D. S. T.—1:00 A. M., weather forecast and business reports. 1:30 P. M., business reports. 3:00 P. M., market reports. 4:00 P. M., piano recital by Miss Adelaide Apfel. 10:00 P. M., three minutes with the United States Civil Service. 10:03 P. M., Popular program and entertainment by the Doherty Melody Boys.

WHN, New York, 360m (830k), E. S. D. S. T.—6:30-7:30 P. M., dinner music by Olcott Vail's Trio and Paul Specht's Alamac Orchestra. 9:30 P. M., Crystal Palace Orchestra. 10:00 P. M., "Defense Day," by Robert E. Condon, of the National Security League. 10:30 P. M., Roseland Dance Orchestra. 11:00 P. M., Chas. Strickland's Palisades Park Orchestra. 11:30 P. M., Bob Schaefer and his entertainers.

KHJ, Los Angeles, 395m (760k), P. T.—6:00 P. M., Art Hickman's Concert Orchestra from the Biltmore Hotel. 6:30 P. M., children's program. Dickie Brandon, screen juvenile. 8:00 P. M., program by the Continental National Bank. 9:00 P. M., program by the Filipino String Orchestra. 10:00 P. M., Art Hickman's Dance Orchestra.

KFI, Los Angeles, 469m (640k), P. T.—5:00 P. M., Evening Herald news bulletins. 5:30 P. M., Examiner news bulletins. 6:45 P. M., Y. M. C. A. lecture and L. A. Junior Quartette. 8:00 P. M., Ambassador Hotel Cocoanut Grove Orchestra. 9:00 P. M., Examiner studio program. 10:00 P. M., John Smallman vocal program.

WWJ, Detroit, 517m (580k), E. S. T.—9:00 A. M. "Tonight's dinner" and a special talk by the Woman's Editor. 9:45 A. M., Public Health Service bulletins and talks on subjects of general interest. 10:25 A. M., weather forecast. 11:55 A. M., Arlington time. 12:00 P. M., Detroit News Orchestra. 3:50 P. M., weather forecast. 3:55 P. M., market reports and baseball scores. 5:00 P. M., baseball scores.

WOC, Davenport, Ia., 484m (620k), C. S. T.—9:00 A. M., opening market quotations. 10:00 A. M., household hints. 10:55 A. M., time signals. 11:00 A. M., weather and river forecast. 11:05 A. M., market quotations. 12:00 Noon, chimes concert. 12:15 P. M., weather forecast. 1:00 P. M., closing stocks and markets, including weekly report of wool market. 7:00 P. M., sport news and weather forecast. 9:00 P. M., orchestra program. The Palmer School Radio Orchestra.

WOAW, Omaha, Neb., 526m (570k), C. S. T.—6:00 P. M., Every Child's Story Hour, by Grace Sorenson. 6:30 P. M., dinner program by Harmo-Jazz Orchestra, Ralph Feral, director. 9:00 P. M., program courtesy Knights of Columbus. Arranged by Chas. M. Fixa. Harmo-Jazz Orchestra, K. of C. Glee Club, Mrs. Jas. H. Hanley, soprano.

KDKA, Pittsburgh, 326m (920k), E. S. D. S. T.—5:30 P. M., dinner concert by the KDKA Little Symphony Orchestra, Victor Saudek, conductor. 6:00 P. M., baseball scores. 6:30 P. M., The Children's Period. Some songs for the kiddies. 7:00 P. M., baseball scores. "Shrubs and Perennials for September" prepared by the Fruit Growers Nurseries. 7:15 P. M., program arranged by the National Stockman and Farmer. 7:40 P. M., market reports. 9:00 P. M., concert by the KDKA Little Symphony Orchestra and the Brackenridge Glee Club. 9:55 P. M., time signals. 10:00 P. M., weather forecast. Baseball scores. 10:05 P. M., concert from the Pittsburgh Post studio.

KYW, Chicago, 536m (560k), C. S. D. S. T.—1:35 P. M., "Afternoon Frolic," broadcast from KYW's studio. 5:02 P. M., news, financial and final markets. 6:00 P. M., dinner concert, broadcast from the Congress Hotel. 7:20 to 8:15 P. M., musical program; Hilda Butler Farr, pianist. 8:15 P. M., "Safety First" talk by Mr. Z. C. Elkin. 9:00 P. M., "At Home" program.

WJY, New York, 405m (740k), E. S. D. S. T.—7:30 P. M., weekly French lesson. 8:00 P. M., John Hepler, pianist; Andrew Donnelly, tenor. 9:00 P. M., Al Reiser's Club Ferreri Orchestra.

WGY, Schenectady, N. Y., 380m (790k), E. S. T.—11:30 A. M., stock market report. 11:40 A. M., produce market report. 11:45 A. M., weather report. 11:50 A. M., report on Farm Movement of Lettuce. 11:55 A. M., time signals. 1:00 P. M., music and fashion talk, "Notes on Autumn Fashions." 5:00 P. M., produce and stock market quotations; news bulletins baseball results. 5:15 P. M., report on condition of New York State Highways. 5:30 P. M., organ recital by Stephen E. Boisclair. 7:40 P. M., baseball scores. 7:45 P. M., "A Few Moments with New Books." 8:00 P. M., One-Act Plays by WGY Student Players.

WJZ, New York, 455m (660k), E. S. D. S. T.—1:00 P. M., Nathan Abas' Hotel Pennsylvania Orchestra. 4:00 P. M., Eleanor Gunn's fashion talk. 4:10 P. M., daily menu. 4:15 P. M., "The Progress of the World." 5:30 P. M., State and Federal agricultural reports; farm and home reports; closing quotations N. Y. Stock Exchange; foreign exchange quotations; Evening Post News. 7:55 P. M., "Big Vote," John B. Kennedy. 8:00 P. M., Wall Street Journal review. 8:30 P. M., Wanamaker organ concert. 9:15 P. M., blow-by-blow description of the Wills-Firpo boxing match, direct from the ringside at Boyle's Thirty Acres; description of semi-final and final bouts by Major J. Andrew White, famous sport announcer. 10:30 P. M., Waldorf-Astoria dance orchestra.

WEAF, New York, 492m (610k), E. S. D. S. T.—11:00-12:00 A. M., Mabel Empie, soprano; talks to housewives; market and weather reports. 4:00-5:00 P. M., Carl Leggett, baritone; Marion Cara, coloratura soprano; children's stories. 6:00-11:00 P. M., dinner music from the Rose Room of Hotel Waldorf-Astoria; mid-week services by the Federation of Churches; Ada Gordon, pianist; Emily A. Berry, dramatic reader; Oswold Olson, bass; West End Ladies Trio; Vincent Lopez and his orchestra from Hotel Pennsylvania.

Friday, September 12

WDAR, Philadelphia, 395m (760k), E. S. D. S. T.—2:00 P. M., Arcadia Cafe Concert Orchestra. Artist recital from Studio. 4:30 P. M., artist recital from Studio. 5:45 P. M., sporting results. 7:30 P. M., Dream Daddy with the boys and girls. 8:00 P. M., "Turning the Pages," a book review by Arnold Abbott. 8:30 P. M., the Emmett Welch Minstrels; WDAR Sportsman's Fishing Forecast—a report on the week-end fishing conditions along the New Jersey Coast; artist recital and special features; dance music by Benson's Chicago Orchestra; Fry's Million Dollar Pier Orchestra.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—2:30 P. M., direct broadcast of the Davis Cup tennis matches from the Germantown Cricket Club, Philadelphia; these matches will be described play by play by well known tennis stars of the country, as fast as the plays are made. 6:00 P. M., weather forecast. 6:05 P. M., dinner music by Eddie Elkins' Orchestra. 6:45 P. M., agriculture livestock and produce market reports. 7:00 P. M., Uncle Wip's bedtime stories and roll call for the children of Uncle Wip's Kiddie Klub.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—2:30 P. M., "The Army," Major Phillip J. McCook, Supreme Court Judge. 2:45 P. M., "Lighter Than Aircraft," by Commander J. H. Klein, Jr. 3:00 P. M., concert by the orchestra of the S. S. America. 3:45 P. M., "The Navy," speaker to be announced. 6:15 P. M., "Music While You Dine," Lou Strassman and his Four Towers' Orchestra. 6:30 P. M., "Man in the Moon" stories for the children by Josephine Lawrence and William F. B. McNeary. 7:20 P. M., resume of the day's sports with "Jolly Bill" Steinke.

WLW, Cincinnati, O., 423m (710k), C. S. D. S. T.—11:00 A. M., weather forecast and business reports. 1:30 P. M., market reports. 3:00 P. M., stock quotations. 4:00 P. M., piano recital.

WHN, New York, 360m (830k), E. S. D. S. T.—5:00 P. M., Walter Friddie's Trio, violin, piano, drum banjo. 6:30-7:30 P. M., dinner music by Olcott Vail's Trio and Paul Specht's Alamac Orchestra. 9:30 P. M., Chas. Strickland's Palisades Park Orchestra. 10:00 P. M., Gem Orchestra. 10:30 P. M., Roseland Dance Orchestra. 11:30 P. M., Club Alabam Revue.

KHJ, Los Angeles, 395m (760k), P. T.—6:00 P. M., Art Hickman's Concert Orchestra from the Biltmore Hotel. 6:30 P. M., children's program, presenting Richard Headrick, screen juvenile. 8:00 P. M., program presented by Radio Corporation of Southern California. 9:30 P. M., Naval Reserve Band. 10:00 P. M., Art Hickman's Dance Orchestra.

KFI, Los Angeles, 469m (640k), P. T.—5:00 P. M., Evening Herald news bulletins. 5:30 P. M., Examiner news bulletins; 6:45 P. M., Aeolian organ recital. 8:00 P. M., Evening Herald—Marion Ward Players. 9:00 P. M., program from Examiner Studio. 10:00 P. M., Tyrolean Zither Club. 11:00 P. M., Ambassador Hotel Cocoanut Grove Orchestra.

WWJ, Detroit, 517m (580k), E. S. T.—9:30 A. M. "Tonight's Dinner," and a special talk by the Woman's Editor. 9:45 A. M., Public Health Service bulletins and talks of general interest. 10:25 A. M., weather forecast. 11:55 A. M., Arlington time. 12:00 P. M., Detroit News Orchestra. 3:50 P. M., weather forecast. 3:55 P. M., market reports and baseball scores. 5:00 P. M., baseball scores. 8:30 P. M., Detroit News Orchestra.

WOC, Davenport, Ia., 484m (620k), C. S. T.—9:00 A. M., opening market quotations. 10:00 A. M., household hints. 10:55 A. M., time signals. 11:00 A. M., weather and river forecast. 11:05 A. M., market quotations. 12:00 Noon, chimes concert. 12:15 P. M., weather forecast. 1:00 P. M., closing stocks and markets. 7:00 P. M., sport news and weather forecast. 8:00 P. M., musical program—Howard and Harmony Entertainers, Colored Quartette. 9:00 P. M., weekly tourists' road bulletin.

WOAW, Omaha, Neb., 526m (570k), C. S. T.—6:00 P. M., story hour conducted by Doris Claire Secord, daughter of "Uncle Ross." 6:30 P. M., dinner program. 9:00 P. M., program by Misner Merry Minstrels.

KSD, St. Louis, Mo., 546m (550k), C. S. T.—8:15 P. M., broadcasting National Defense Test Day program direct from Washington, D. C., the Secretary of War, General Pershing, General Carty, speakers.

KDKA, Pittsburgh, 326m (720k), E. S. D. S. T.—2:15 P. M., baseball scores, inning by inning. 5:00 P. M., baseball scores. 5:30 p. m., organ recital by Paul E. Fleeger, from the Cameo Theatre. 6:00 P. M., dinner concert. 6:30 P. M., The Children's Period. The Poetry Lady. 6:45 P. M., news bulletins. 7:00 P. M., baseball scores. 7:15 P. M., feature. 7:30 P. M., address by U. S. Bureau of Mines. 7:40 P. M., Stockman reports of the primary livestock and produce markets. 8:00 P. M., concert by Chauncey Parsons, courtesy Rosenbaum Company. 9:55 P. M., time signals. 10:00 P. M., weather forecast; baseball scores.

KYW, Chicago, 536m (560k), C. S. D. S. T.—5:00 P. M., news, financial and final markets; Dun's Review and Bradstreet's Weekly Review of Chicago Trade. 5:45 P. M., children's bedtime story, told by Uncle Bob. 6:00 P. M., dinner concert. 6:30 P. M., program from KYW's studio, Duncan Sisters' Music Co. 7:20 P. M., speeches, auspices American Farm Bureau Federation. 8:00 P. M., midnight revue. 9:30 P. M., "Around the Town with KYW in Chicago." (Stage Reviews). 9:45 to 11:30 P. M., continuation of the midnight revue.

WJY, New York, 405m (740k), E. S. D. S. T.—7:30 P. M., Leonard Nelson's Knickerbocker Grill Orchestra. 8:15 P. M., Time Pop Question Game. 9:30 P. M., Ed Hirsch's Orchestra.

WGY, Schenectady, N. Y., 380m (790k), E. S. T.—11:30 A. M., stock market report. 11:40 A. M., produce market report. 11:45 A. M., weather forecast. 11:50 A. M., report on farm movement of lettuce. 11:55 A. M., time signals. 1:00 P. M., music and household hints. 5:00 P. M., produce and stock market quotations news bulletins; baseball results. 5:30 P. M., stories for children. 5:45 P. M., children's story, in French, by Frederic Duclert. 6:00 P. M., International Sunday School Session. 7:40 P. M., baseball results. 7:45 P. M., health talk. 7:50 P. M., program by WGY Orchestra.

WJZ, New York, 455m (660k), E. S. D. S. T.—1:00 P. M., Hotel Ambassador Trio. 3:00 P. M., Defense Day Meeting, from Engineers' Club; speakers, Judge Elbert Gary and Gen. Guy E. Tripp. 4:00 P. M., Eleanor Gunn's Fashion Talk. 4:10 P. M., daily menu. 4:15 P. M., Arts and Decorations Talk. 4:30 P. M., Hotel Astor Organ Recital. 5:30 P. M., State and Federal agricultural reports farm and home reports; closing quotations N. Y. Stock Exchange; foreign exchange quotations; Evening Post News. 7:00 P. M., Lafayette Hotel Orchestra. 8:00 P. M., Wall Street Journal review. 8:30 P. M., Looseleaf Current Topics, Wm. H. Allen. 8:45 P. M., Special Defense Test Day program. 10:30 P. M., Harold Stern's Belleclair Towers Orchestra.

WEAF, New York, 492m (610k), E. S. D. S. T.—11:00-12:00 A. M., Helen Morris, soprano; health talk—talk by Leonard Barron. 4:00-5:00 P. M., club program for women; John Burnham, pianist. 6:00-10:00 P. M., dinner music from Rose Room of Hotel Waldorf-Astoria; stories for children by Blanche Elizabeth Wade; Joseph White, tenor; Harry Jentes, jazz pianist; Rosella Sheiner, 10-year-old Violinist; B. Fischer's Dance Orchestra.

WOO, Philadelphia, 509m (590k), E. S. D. S. T.—7:30 P. M., sports results and police reports; dinner music by A. Candelori and his Hotel Adelphia Roof Garden Orchestra. 8:15 P. M., historical address, "Defense of Philadelphia," Major John A. Farrell. 8:30 P. M., Defense Day Program of Music with address by His Honor Freeland W. Kendrick, Mayor of Philadelphia. 9:45 P. M., organ recital, Harriette G. Ridley. 10:15 P. M., broadcasting from War Department at Washington of Defense Day addresses by Hon. John W. Weeks, Sec. of War, Gen. J. J. Carty, U. S. A., and the farewell address of Gen. John J. Pershing. 10:55 P. M., time signal. 11:02 P. M., weather forecast. 11:03 P. M., dance program by A. Candelori and his Hotel Adelphia Roof Garden Orchestra.

Saturday, September 13

WDAR, Philadelphia, 395m (760k), E. S. D. S. T.—11:45 A. M., daily almanac. 12 Noon, organ recital from Stanley Theatre; features from Studio; Arcadia Cafe Concert Orchestra, Prof. Feri Sarkozi, director. 2-3 P. M., artist recital from the studio. 4:30 P. M., dance program. 5:45 P. M., sporting results and special announcements. 7:30 P. M., Dream Daddy with the boys and girls.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—6:05 P. M., dinner music arranged by Harry Link. 6:45 P. M., agriculture livestock and produce market reports. 7 P. M., Uncle Wip's bedtime stories and roll call for the children of Uncle Wip's Kiddie Klub. 8 P. M., concert by Comfort's Philharmonic Orchestra. Soloist, Bessie Crown, soprano. 8:45 P. M., "What the Wild Waves Are Saying." 8:50 P. M., concert by Vessella's Concert Band. 10 P. M., dance music by Bob Leman's dance orchestra. 11:05 P. M., organ recital by Karl Bonawitz.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—6:15 P. M., "Music While You Dine," Charley Storm and his collegians. 7:15 P. M., resume of the day's sports with "Jolly Bill" Steinke. 8 P. M., Mrs. John W. Anderson, soprano; Ethel Arrighi at piano. 8:45 P. M., Herman Gelhausen, baritone. 9 P. M., Alfred B. Stanford, writer of sea tales, in a talk on the fun and pathos in writing literature of the sea. 9:15 P. M., Dolores Aquarino, coloratura soprano. 10 P. M., piano

selections by Julius Koehl. 10:15 P. M., program by the Manhattan Serenaders.

WLW, Cincinnati, O., 423m (710k), C. S. D. S. T.—11 A. M., weather forecast and busniess reports. 1:30 P. M., market reports.

PWX, Havana, 400m (750k), E. S. T.—8 P. M., concert at the Studio of Station PWX, by employees of the Cuban Telephone Company.

WHN, New York, 360m (830k), E. S. D. S. T.—8 P. M., Ida Nachmanowitz, concert pianist. 8:15 P. M., Augusta Strangfeld, soprano. 8:30 P. M., Arthur Stone, blind pianist. 8:40 P. M., Perfect Harmony Four Quartette. 8:50 P. M., Vic and Jack Laura, singing and ukulele. 9:00 P. M., Chas. Strickland's Palisades Park Orchestra. 9:30 P. M., Barbara Weil, soprano. 9:40 P. M., Jack Celestain, colored jazz pianist. 9:50 P. M., J. Emmett Kelly, tenor. 10 P. M., Melody Four Male Quartette. 10:30 P. M., Pergola Brothers, banjo and accordian. 10:45 P. M., Fitzpatrick Brothers, singing old time medlies. 11 P. M., Frank Wright and Frank Bessinger, harmony singers. 11:15 P. M., Jimmy Clarke and his entertainers. 11:30 P. M., Roseland Dance Orchestra.

KHJ, Los Angeles, 395m (760k), P. T.—12:30 P. M., news items and music. 6 P. M., Art Hickman's Concert Orchestra from the Biltmore Hotel. 6:30 P. M., children's hour. 8 P. M., two hours with the classics.

KFI, Los Angeles, 469m (640k), P. T.—5 P. M., Evening Herald news bulletins. 5:30 P. M., Examiner news bulletins. 6:45 P. M., dance orchestra. 8 P. M. vocal recital. 9 P. M., program from Examiner Studio. 10 P. M., Packard popular program. 11 P. M., Ambassador Hotel Cocoanut Grove Orchestra.

WWJ, Detroit, 517m (580k), E. S. T.—12 P. M., Detroit News Orchestra. 3:50 P. M., weather forecast. 3:55 P. M., market reports and baseball scores. 5 P. M., baseball scores. 8:30 P. M., The Detroit News Orchestra; John Drummond, baritone. 10 P. M., Dance music by Jean Goldkette's Victor Recording Orchestra. 11 P. M., Detroit News Orchestra.

WOC, Davenport, Ia., 484m (620k), C. S. T.—9 A. M., opening market quotations. 10 A. M., household hints. 10:55 A. M., time signals. 11 A. M., weather and river forecast. 11:05 A. M., government bulletins. 11:15 A. M., closing market quotations. 12 Noon, chimes concert. 12:15 P. M., weather forecast. 7 P. M., sport news and weather forecast. 9 P. M., orchestra program. The Palmer School Radio Orchestra.

WOAW, Omaha, Neb., 526m (570k), C. S. T.—6 P. M., address, "My Exploration Trip to the Loup River Valley," E. E. Blackman, curator of museum. 6:30 P. M., dinner program by G. R.'s Radio Orchestra. 9 P. M., program from vocal studio of Walter B. Graham, baritone; Regina Franklin, accompanist.

KSD, St. Louis, Mo., 546m (550k), C. S. T.—8 P. M., Missouri Theater Orchestra and specialties broadcast direct from Missouri Theater.

KDKA, Pittsburgh, 326m (920k), E. S. D. S. T.—2 P. M., popular concert, and baseball scores, inning by inning. 5 P. M., baseball scores. 5:30 P. M., dinner concert by the Westinghoue Band, T. J. Vastine, director. 6 P. M., baseball scores. 6:30 P. M., The Children's Period, The Kiddies Buddy. 6:45 P. M., Last Minute Helps to teachers of uniform Sunday School Lessons, by C. C. Johnson. 7 P. M., baseball scores; sport review by James J. Long. 7:15 P. M., feature. 8 P. M., concert by the Westinghouse Band.

KYW, Chicago, 536m (560k), C. S. D. S. T.—5:02 P. M., news, financial and final markets. 5:45 P. M., children's bedtime story, by Uncle Bob. 6 P. M., dinner concert. 8:05 P. M., talk by Vivetter Gorman. 8:10 P. M., short stories, articles and humorous sketches.

WGY, Schenectady, N. Y., 380m (790k), E. S. T.—11:30 A. M., stock market report. 11:40 A. M., produce market report. 11:50 A. M., report on farm movement of lettuce. 11:55 A. M., time signals. 9:30 P. M., dance music by Joseph A. Chickene and his Clover Club Orchestra.

WJZ, New York, 455m (660k), E. S. D. S. T.—1 P. M., Hotel Vanderbilt Orchestra; Joseph Strissof, director. 3 P. M., third and final International Polo Game direct from Meadowbrook Country Club; Major A. G. Rudd, U. S. Army, and Major J. Andrew White, announcers. 5:30 P. M., State and Federal agricultural reports; farm and home reports; closing quotations N. Y. Stock Exchange foreign exchange quotations; Evening Post News. 7 P. M., Waldorf-Astoria dance orchestra. 9:30 P. M., concert orchestra of S. S. France. 10:30 P. M., Hotel Astor Orchestra.

WEAF, New York, 492m (610k), E. S. D. S. T.—4-5 P. M., Bob Fridkin and his Clifford Lodge Orchestra. 6-11 P. M., dinner music from the Rose Room of the Hotel Waldorf-Astoria; College Club Orchestra; Judith Roth, soprano and Mildred Van Vliet Feldman, pianist; Vincent Lopez and his orchestra from the Hotel Pennsylvania.

WOO, Philadelphia, 509m (590k), E. S. D. S. T.—11 A. M., grand organ. 11:30 A. M., weather forecast. 12 Noon, luncheon music by the Tea Room Orchestra. 12:55 P. M., time signal. 4:45 P. M., grand organ and trumpets. 7:30 P. M., sports results and police reports. 10:55 P. M., time signal. 11:02 P. M., weather forecast.

Sunday, September 14

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—7:30 P. M., religious service of the First Presbyterian Church of Jefferson City, Rev. W. Hooper Adams, Pastor; Mrs. Mary Armstrong, organist; Mrs. John V. Jobe, director of the Vested Choir.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—3:35 P. M., special Sunday afternoon concert by Comfort's Philharmonic Orchestra. 7:45 P. M., evening service, broadcast direct from Holy Trinity Church, Philadelphia, Rev. Floyd W. Tomkins, D. D., Rector. 9:30 P. M., Sunday evening concert, with prominent soloists.

KPO, San Francisco, 423m (710k), P. T.—11 A. M., undenominational and non-sectarian church services; speaker, Dr. W. J. Fisher, Presbyterian soloist, Leonore Sollendar Campbell, soprano; organ selections by Theodore J. Irwin. 8:30 to 10 P. M., concert by Rudy Seiger's Fairmount Hotel Orchestra.

KCW, Portland, Ore., 492m (610k), P. T.—6 P. M., church services.

WHAS, Louisville, Ky., 400m (750k), C. S. T.—9:57 A. M., organ music. 10 A. M., church service auspices Broadway Baptist Church, the Rev. Dr. Russell Johnson Pirkey, pastor. H. U. Goodwin, organist and choir director. Mrs. Roy N. Downs, soprano; Miss Angeline McCrocklin, contralto; Charles H. Barns, Jr., tenor; A. W. Thompson, baritone. 4-5 P. M., concert direction of Miss Myrtle George Stinger.

WWJ, Detroit, 517m (580k), E. S. T.—11 A. M., services at St. Paul's Episcopal Cathedral, broadcast from the cathedral. 2 P. M., Detroit News Orchestra.

KGO, Oakland, Cal., 312m (960k), P. T.—11 A. M., service from First Methodist Episcopal Church, Oakland, California. 3:30 P. M., concert by KGO Little Symphony Orchestra, assisted by the united choirs of the colored churches of Oakland. 7:30 P. M., evening service, First Methodist Episcopal Church, Oakland.

WOAW, Omaha, Neb., 526m (570k), C. S. T.—9 A. M., radio chapel service, conducted by Rev. R. R. Brown. 9 P. M., musical chapel service by Grace Lutheran Church, Rev. A. O. Soholm, pastor. Gilbert W. Uhler, choir director; Florence Olsen Smith, accompanist.

KYW, Chicago, 536m (560k), C. S. D. S. T.—10 A. M., Sunday morning service, St. Chryostom's Episcopal Church; Rev. Norman C. Hutton, rector. 1:30 P. M., studio chapel service broadcast from KYW's studio.

Monday, September 15

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—8 P. M., address by Arthur T. Nelson, State Marketing Commissioner. 8:20 P. M., musical program by Missouri State Prison Orchestra; piano solos by the "King of the Ivories."

WMC, Memphis, Tenn., 500m (600k), C. S. T.—8:30 P. M., Prof. Gasper Pappalardo and his Hotel Gayoso Orchestra.

KPO, San Francisco, 423m (710k), P. T.—1 P. M., Rudy Seiger's Fairmount Hotel Orchestra. 2:30 P. M., Nancy Buckley, poems; musical matinee. 4:30 P. M., Rudy Seiger's Fairmount Orchestra. 5:30 P. M., children's hour stories by Big Brother of KPO. 7 P. M., Rudy Seiger's Fairmount Hotel Orchestra. 8 P. M., organ recital by Theodore J. Irwin. 9 P. M., dramatic soprano, Dorothy Olmsted. Piano solos by Miss M. Igler. 10 P. M., E. Max Bradfield's Versatile Band.

KGW, Portland, Ore., 492m (610k), P. T.—11:30 A. M., weather forecast. 3:30 P. M., literary programme by Portland Library Association. 7:15 P. M., police reports. 7:30 P. M., baseball scores, weather forecast and market reports. 8:00 P. M., concert.

WHAS, Louisville, Ky., 400m (750k), C. S. T.—4-5 P. M., selections by Alamo Theater orchestra. police bulletins; weather forecast for Kentucky, Indiana and Tennessee; "Just Among Home Folks"; readings: selected Courier-Journal and Louisville Times editorials; late news bulletins. 4:55 P. M., local livestock, produce and grain market reports. 5 P. M., Central Standard time announced.

WFAA, Dallas, Tex., 476m (630k), C. S. T.—12:30 P. M., address, Dr. J. D. Boon, astronomer, Southern Methodist University. 8:30 P. M., male quartet and chorus in popular and comic variety program.

KGO, Oakland, Cal., 312m (960k), P. T.—1:30 P. M., N. Y. and S. F. stock reports and weather. 3:00 P. M., studio musical program. 4-5:30 P. M., Henry Halstead's Dance Orchestra, Hotel St. Francis. 5:30 P. M., Aunt Betty stories and KGO Kiddies' Klub. 6:45 P. M., stock reports, weather, S. F. produce news, baseball scores, and news items. 8 P. M., educational program; courses in agriculture, music, economics, and literature; music by Arion Trio. 10 P. M. to 1 A. M., dance music program by Henry Halstead's Orchestra and soloists, Hotel St. Francis.

KFAE, Pullman, Wash., 330m (910k), P. T.—Piano solos, Miss Miriam Zimmerman; The Spillman Tour of Eastern Washington, R. M. Turner; New Football Rules, "Hack" Applequist, assistant coach; Let's Vote This Year, Prof. N. J. Aiken.

WMAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sport results. 4:10 P. M., Mothers in Council, by Mrs. Frances M. Ford; first of a weekly series for mothers. 4:30 P. M., musical program. 6 P. M., Chicago theater organ recital. 6:30 P. M., Hotel LaSalle orchestra.

Tuesday, September 15

KPO, San Francisco, 423m (710k), P. T.—2:30 P. M., organ recital by Theodore J. Irwin. 4:30 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 5:30 P. M., children's hour stories by Big Brother of KPO. 7 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 8 P. M., program by the Dons of Peralto of Oakland. 10 P. M., E. Max Bradfield's versatile band.

KGW, Portland, Ore., 492m (610k), P. T.—11:30 A. M., weather forecast. 3:30 P. M., children's programme. 7:15 P. M., police reports. 7:30 P. M., baseball scores, weather forecast and market reports. 8 P. M., concert provided by Seiberling-Lucas Music Co.

WHAS, Louisville, Ky., 400m (750k), C. S. T.—4-5 P. M., selections by the Alamo Theater orchestra; Harry S. Currie, director; police bulletins; weather forecast for Kentucky, Indiana and Tennessee; "Just Among Home Folks" readings; late news bulletins. 4:55 P. M., local livestock, produce and grain market reports. 5 P. M., Central Standard time announced. 7:30 to 9 P. M., concert by the Zur Schmiede Harmony Diggers; late news bulletins; Central Standard time announced at 9 o'clock.

WFAA, Dallas, Tex., 476m (630k), C. S. T.—12:30 P. M., address, DeWitt McMurray. 8:30 P. M., Walter J. Fried and assisting talent in violin recital. 11-12 P. M., Schubert Junior Glee Club and Choral Club recital.

KGO, Oakland, Cal., 312m (960k), P. T.—1:30 P. M., N. Y. and S. F. stock reports and weather. 4 P. M., Concert Orchestra of the Hotel St. Francis. 6:45 P. M., stock reports, weather, S. F. produce news, baseball scores, and news items. 8 P. M., program by the Arion Trio; assisted by Virginia Treadwell, contralto; H. I. Milholland, reader; Carl Anderson, tenor; and Ford E. Samuel, speaker. 10 P. M. to 1 A. M., dance music program by Henry Halstead's Orchestra and soloists, Hotel St. Francis.

WMAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sport results. 4:10 P. M., second lecture by the Red Cross Home Nursing Service. 4:30 P. M., musical program. 6 P. M., Chicago theater

(*Concluded on page 26*)

Who Is America's Most Popular Radio Entertainer?

The Answer Will Be Published in the Fall Buyers' Number of Radio World, Issue of September 27

Now is the last week of the test. All ballots must be cast by September 21. Letters enclosing ballots must be postmarked no later than 11:59 P. M., September 21.

Everybody is interested in this query: Who is America's most popular radio entertainer? You have your favorite. Who is she or he? Let us know your choice, whether a comedian, an opera singer, a jazz band, or a story-teller.

RADIO WORLD wants to be able to tell the world the name of the entertainer who stands highest in the regard of listeners-in.

Use the accompany blank and mail to Radiocasting Manager, RADIO WORLD.

Cut off. Fill out. Mail today.

RADIOCASTING MANAGER, RADIO WORLD,
1493 Broadway, New York City.

Dear Sir:

My favorite entertainer is.....Station.....

Name .....

Street Address .....

City and State .....

Yearly subscribers for RADIO WORLD may, when sending in their $6.00 for a yearly subscription, vote the entire fifty-two issues in advance for their favorite entertainer, when they so designate their desire to do so. In the August 16 issue was published a tally showing H. M. Snodgrass, of WOS, Jefferson City, Mo., leading.

A THOUGHT FOR THE WEEK
—What radio is merely phophesies the still mightier factor it will be.

RADIO WORLD

Title Reg. U. S. Pat. Off.

TELEPHONE: LACKAWANNA 2062, 6976
PUBLISHED EVERY WEDNESDAY
(Dated Saturday of same week)
FROM PUBLICATION OFFICE
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San Francisco Representative: Benj. Leven, 582 Market St.
European Representative: The International News Co., Breams Bldgs., Chancery Lane, London, Eng. Paris, France, Brentano's 38 Avenue de l'Opera.

EDITOR, Roland Burke Hennessy
MANAGING EDITOR, Herman Bernard
TECHNICAL EDITOR, N. N. Bernstein

SUBSCRIPTION RATES

Fifteen cents a copy. $6.00 a year. $3.00 for six months. $1.50 for three months. Add $1.00 a year extra for foreign postage. Canada, 50 cents.

Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order, is automatic acknowledgment of their subscription order. Changes of address should be received at this office two weeks before date of publication. Always give old address also. State whether subscription is new or a renewal.

ADVERTISING RATES

FLAT RATE—Page, 7¼x11", $150; half page, 3¼ D. C. or 5⅛x3 col., $75; quarter page, 4⅛ D. C., $37.50; one col., 2¼x11"; $50—$5 per inch. Back cover page, two colors, $250. Preferred positions 10% extra.

CLASSIFIED ADVERTISEMENTS

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

Entered as second-class matter, March 28, 1922, at the Post Office at New York, New York, under the act of March 3, 1879.

SEPTEMBER 13, 1924

Where Caution Is Needed

STATIONS operated by a municipality are charged with a special responsibility, that of keeping their programs free of politics. The temptation is strong to vent one's political ideas before the microphone, for the vast audience is indeed an invitation. But it is often the better part of wisdom to refuse some invitations, for their acceptance invites trouble. If a municipal administration desires its creed and doctrine transmitted, at least it should take the curse off that by permitting the other side to be heard on the same occasion. Radiocasting is a proper municipal function, just as much so as park concerts. But would it be good taste and pleasing to the audience if advantage were taken of the assemblage to turn it into a political mass meeting?

Fessenden Makes Set Play Piano and Violin

(International Newsreel)

PROFESSOR REGINALD A. FESSENDEN, noted radio engineer, has developed a new loud speaker device which he attaches to an ordinary violin or piano. The new invention is attached to the output of the receiving set and placed directly on the violin. It is said that his discovery will add new feats to his already remarkable radio achievements. There is no squeaking or scratching, no static nor interference. The voice and music comes through clearly with excellent reproduction on the violin strings. Professor Fessenden's device also turns a piano into a loud speaker and is able to record perfectly music from any distance.

Marching Onward

THE next issue of RADIO WORLD, dated September 20, on sale at all newsstands on Wednesday, September 17, will contain many interesting and instructive articles by RADIO WORLD's well-known popular authors. In that issue will appear: Part II of the Rev. Henry A. Judge's article on the tubeless amplifier that works a loud speaker; "How to Build a Fixed Radio-Frequency Transformer," by A. F. Lapierre, Consulting Engineer; "First Aid to Listeners-in," by N. N. Bernstein, Technical Editor; "Saving Time in Testing Circuits," by Herman Bernard; "A 1-Dial Reflex Set," by Byrt C. Caldwell, and "An Explanation of All Forms of RF Circuits," by A. P. Peck, Associate, Institute of Radio Engineers.

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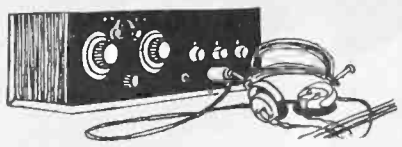
RADIO WORLD

A Weekly Paper Published Every Wednesday and Dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y.

September 13, 1924
Vol. 5 No. 25
15 Cents.

A COMPLETE LIST OF RADIOCASTING STATIONS, revised and corrected up to the date of going to press, will be published in the September 27 issue of RADIO WORLD.



The RADIO PRIMER

Information and Instruction for the Beginner

Rheostats

By A. P. Peck

ASSOCIATE INSTITUTE OF RADIO ENGINEERS

TO get a really good rheostat you will have to pay at least a dollar, maybe more. Do not begrudge it, as a good instrument is worth it.

A. P. PECK

By purchasing a good rheostat you will be doing yourself a service. Sometimes after a set is built the rheostat is in an inaccessible place and if anything goes wrong with it a great deal of connecting wire has to be removed before the trouble can be righted. Avoid all this by taking out insurance. That means buying the best rheostat you can afford. A good rheostat is worth its weight in gold.

In discussing the good and bad points of rheostats we will confine ourselves to the wire-wound type and one other. The carbon grain or disc type are practically all good. The only trouble that you will be likely to find with them is that the porcelain shell may crack. When this happens, get a new rheostat.

Fig. 1 shows the rear view of a standard type of wire-wound rheostat numbered for ready reference. This type is designed to be mounted on a panel, as are practically all of the rheostats made.

First to be considered is the base (1). This should be made of bakelite or hard rubber. Soft compositions are likely to break when machine screws are tightened up in the mounting holes and are therefore to be avoided. (2) The wire-wound sector. The material on which the wire is wound is usually fiber, and in this position fiber gives fairly good results. The wire must be wound tightly. In the better types, the fiber sector is grooved so that the wire is held firmly in position. This is important, because if the turns touch each other, they become short circuited and cause trouble. Then, it must be remembered that when wire becomes hot, as it does on a rheostat when in use, it expands. Therefore, if the wire is not held in some manner, the turns are bound to touch, more so because of the action of the contact lever that tends to force the wires against each other. (3) The connection between the end of the resistance wire and the binding post must be solid, otherwise the heat of the filament may vary during reception with consequent annoying noise. Solder this connection if the manufacturer did not do so. There is usually a sliding contact between the connection strip (4) and the contact arm (5). This should be as firm as possible to avoid fluctuations of current. When I buy a new rheostat I make sure of a good contact here by soldering one end of a flexible lead to the shaft and the other end to the binding post. Then we have the set screw (6). This is provided to hold the contact arm securely to the shaft.

One other type of instrument that deserves attention is the automatic rheostat that is designed to be used with amplifying tubes (Amperites). Do not try to use one of these on your detector tube, as it does not allow fine adjustment of the current.

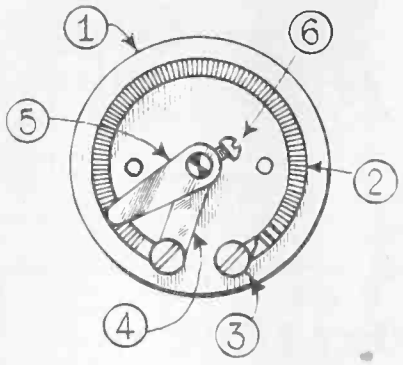


Fig. 1

THE WIRE-WOUND TYPE of rheostat (Fig. 1) consists of six parts, numbered on the diagram. The base (1) is made of bakelite or hard rubber. The sector on which the wire is wound is designated 2. The total amount of wire wound thereon, and its thickness, determine the total maximum resistance of the rheostat. The connection between the wound wire and the rheostat binding post (3) should be firm and secure. The connecting strip (4) is joined to the remaining binding post of the rheostat and the movable contact arm (5) through a shaft. This shaft protrudes through the front panel of your set. The movable arm is secured to the shaft by means of a set-screw (6).

However, in amplifying circuits it gives excellent results and reduces the number of controls. These instruments are supplied in different values for different types of tubes.

Now we come to a use for rheostats that is not very well known or understood. When the fan changes from, say, 6-volt tubes to those requiring a lower potential, such as the UV199, he usually gets rid of his storage battery. This is entirely unnecessary. The secret is this—either change the rheostats in the set for those with a resistance of 100 to 120 ohms or use a resistance unit. The additional resistance will take care of any extra power of the battery and prevent it from burning out the tube.

If you cannot get a rheostat of the mentioned resistance, get a resistance unit that is to be connected in series with the rheostat in the set. After the unit is set at about the required point, the actual adjustment of the filament current may be accomplished by means of the standard rheostat. These uits may be made by winding resistance wire on a bakelite or hard hiubber form, providing a slider or similar attachment for varying the amount of wire in use. Resistance wire may be purchased quite cheaply from radio or electrical supply stores. Concerns supply wire and booklets showing the resistance of their various products from which the size and amount of wire necessary for your use can be calculated. After the units are made up they can be mounted on the base board in any convenient position and then roughly adjusted, after which the fine adjustments may be made by means of the rheostat already contained in the set.

Beginner's Dictionary

AN aperiodic circuit is one having sufficiently high resistance to prevent natural oscillations. It will not respond to any frequency. It is a circuit having no tuning condenser or tuning coil.

New Corporations

Ambassador Electrical Service Corp., Brooklyn, N. Y., $10,000. W. Kessler, G. Hoerner. Attorney, H. Lewis, 220 West 42nd St., N. Y. C.

All Radio Products Co., N. Y. C., $10,000. M. Schulz, F. Burgheimer, E. Meyrowitz. Attorney, W. Galland, 1 Madison Ave.

City Radio Co., N. Y. C., $20,000. H. M. Stein, H. Kirk. Attorney, I. Sack, 110 West 40th St.

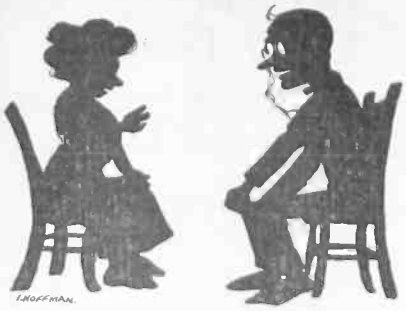
Monarch Radio Sales, Wilmington, Del., to manufacture apparatus, $100,000. By American Guaranty & Trust Co.

Kustombilt Radio Corp., N. Y. C., 10,000 shares preferred stock at $10 each; 20,000 common at $1 each active capital $120,000. J. K. and F. J. Sprague, J. J. Tucker. Attorney, M. Levey, 110 East 42nd St.

Leslie Corp., N. Y. C., radio and electrical work, 500 shares common stock, no par value. W. H. Walden, T. F. Kuper. Attorney, C. D. Sprung, 15 Park Row.

Colonial Radio Corp., N. Y. C., to manufacture, $4,000,000. Corporation Trust Co. of America, at Wilmington, Del.

Confidence



VISITOR—I have a fine set. Get everything—coast-to-coast reception on the loud speaker. Also static.

HOSTESS—My husband hasn't gotten static but could if he tried.

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 .....

Eric J. Everett, 135 W. 16th St., N. Y. C.
Arthur C. Day, Box 254, Gas City, Ind.
E. L. Davis, 132 S. Main St., Niles, O.
C. B. Kull, 1605 Marshall Ave., Mattoon, Ill.
C. H. Hodgkin, Rochester, O.
Thomas F. Abbott, Box 52, King City, Mo.
Geo. F. Weisener, S. Pittsburgh, Tenn.
G. G. Pasley, 319 Second St., Mt. Vernon, Ill.
Kester Brewer, 122 E. Orange Ave., Monrovia, Cal.
Roy Winberg, 407 S. Citrus Ave., Los Angeles, Cal.
Ben F. Hassler, 1823 Ninth St., Peru, Ill.
E. W. Saxe, 1871 North Ave., Niagara Falls, N. Y.
Louis U. Diemert, 852 Charleston St., Mobile, Ala.
R. R. Prosch, Rush Center, Kans.
G. P. Heckman, 233 N. Franklin St., Chambersburg, Pa.
Joe McVay, Butte City, Glenn Co., Cal.
Geo. S. Fish, Rancocas, N. J.
Karl F. Anderson, Box 234, Raquette Lake, N. Y.
J. W. Tubbs, McComb, Miss.
H. H. Schlosser, Box 122, Tuckahoe, N. Y.
Joseph Greenspan, 190 Knickerbocker Ave., Brooklyn, N. Y.
Otto Greggerson, Elkhorn, Neb.
St. Elmo Powell, Box 464, Memphis, Tex.
J. B. Gardner, 533 Carolina St., Gary, Ind.
D. I. Porter, 252 W. 121st St., N. Y. C.
J. B. Hull, 246 W. 102nd St., N. Y. C.
J. G. Wildman, 7334 Finance St., Homewood, Pa.
E. H. Prendergast, Saranac, N. Y.
R. W. Poots, 5914 Linwood Ave, Cleveland, O.
Salvador E Gutierrez, Apartado 162, Mexico City, Mex.
Chas. E. Boucher, 20 Boggs Ave., Mt. Washington, Pittsburgh, Pa.
W. T. Huffnall, 2106 Cumberland St., Waco, Tex.
Thomas Cook, 3938 Third St., Des Moines, Ia.
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O. W. Forster, 39 Manor Rd., Lynnbrook, N. Y.
Harold Sullivan, Macomb, Ill.
H. F. Sarber, 947 E. Market St., Indianapolis, Ind.
H. L. McMahan, 215 Walnut St., Grand Forks, N. D.
Citizens Radio Co., 513 Coppin Bldg., Covington, Ky.
Thos. J. P. Shannon, The Radio Inn, Bell, Cal.
C. M. Lovell, 4210 McPherson Ave., St. Louis, Mo.
George Steitz, 4963 a Kansas St., St. Louis, Mo.

The Radio Trade

Hazeltine Suit vs. Freed-Eisemann Ends In a Draw

A DECISION handed down by Federal Judge Inch, in Brooklyn, N. Y., District Court, in a suit by the Hazeltine Research Corporation to terminate the license to the Freed-Eisemann Radio Corporation for non-payment of royalties, leaves the parties as they were prior to the suit.

The court held that the facts did not show a forfeiture, as an adequate remedy exists at law to collect unpaid royalties. The suit was brought in equity.

The Freed-Eisemann Corporation's demand that its payments be limited to certain parts, and not to the entire set, was rejected. Neither the Hazeltine patents nor the Neutrodyne were affected by the decision.

New Model Clear-O-Dyne Prove Attractive

A NEW line of 4- and 5-tube sets has been designed and is being offered by the Cleartone Radio Company of Cincinnati under the name Clear-O-Dyne. These sets employ tuned radio frequency amplification which is adjusted and stabilized for use on all antennas before the sets leave the factory. The Super Clear-O-Dyne consists of two stages of tuned radio-frequency amplification, a detector and two stages of audio-frequency amplification. It has the selectivity that is characteristic of this construction, is capable of producing loud speaker volume on distant stations, and is free from oscillation and distortion on all wave-lengths. The Goldcrest Clear-O-Dyne—as the 4-tube set is called—consists of one stage of radio-frequency amplification with antenna tuning detector and two stages of audio-frequency amplification. These sets have a minimum of adjustments, and can be logged with complete accuracy. They offer a performance that is equal to that of any sets built with the same number of tubes. In appearance they are especially attractive. The cabinets are high grade mahogany with gold finished front panels, Formica base panels, high quality condensers and neat simple wiring. All the parts are made in the Cleartone plant of the finest materials by the most careful workmanship—and are very thoroughly tested for performance.

Durham Leaks Have Special Metal Film

FIXED and variable grid leaks, manufactured by Durham & Co., Inc., 1936 Market Street, Philadelphia, are accurate and noiseless leaks of high efficiency. The fixed leaks are obtainable in values from 5,000 ohms resistance to 10 megohms (10,000,000 ohms). There are 28 leaks in this group. The Durham Variable Grid Leaks have a small insulated shaft for rotation. These are of three types—1,000 to 100,000 ohms, 1 to 5 megohms and 2 to 10 megohms. They are of standard size to fit the ears or springs of mounts, such as those on grid condensers. A feature of the Durham leaks is the metal deposit on the inner or outer surface of a glass tube or rod. This film is annealed to the glass. This special metal is part of a process developed by a professor of electricity and a professor of chemical engineering of one of the largest universities of the East.

Coming Events

SEPT. 22-28—First Annual Radio World's Fair, Madison Square Garden, New York City.

OCT. 2-11—Exposition, Grand Central Palace, New York City, under auspices of American Radio Exposition Co.

OCT. 4-11—Radio and Electrical Exhibition by the Radio Institute, 309 West Cordova St., Vancouver, B. C.

NOV. 3-8—Third Annual National Radio Show, Grand Central Palace. Annual National Radio Convention in conjunction with Show.

NOV. 24 TO 30, INCLUSIVE—International Radio Week.

DEC. 1 TO 6, INCLUSIVE—Boston Radio Exposition, Mechanics Building, Boston.

OCT. 1—Meeting of Institute of Radio Engineers, at 29 West 39th St., N. Y. C. H. de A. Donisthorp will read a paper, "Radio Direction Finding."

OCT. 14 TO 19, INCLUSIVE—Southwestern Radio & Electrical Exposition, Parkmoor Building, Dallas, Texas. Mailing address, Adolphus Hotel, Dallas.

SEPT. 27 TO Oct. 8—Exhibition, National Association of Radio Manufacturers, Albert Hall, London, Eng.

THE USE AND CARE OF A STORAGE BATTERY, by N. N. Bernstein, Technical Editor. How to test the battery, how often to recharge it, what size to buy. Send 15 cents for September 6 issue or start your subscription with that number. Radio World, 1493 Broadway, New York City.

Business Opportunities Radio and Electrical

Rates: 40c a Line; Minimum, 3 lines.

PIONEER RADIO COMPANY in New England offers exceptional opportunity to business man with finances to join present manager in taking over business established seven years; going concern with background of extensive national advertising; excellent standing with trade and orders on hand; prefer man with financial experience to act as treasurer. Write for appointment. Box 1111, RADIO WORLD.

SALESMAN, EXECUTIVE, 34 YEARS, seeks partnership or employment with radio wholesaler or manufacturer. Make investment after trial. Acorn, 520 Broadway, N. Y. C.

INVENTORS—Have your models made at Herman's, 64 Lafayette St., N. Y. C. Phone Franklin 1485.

Patent Victory for De Forest

By BYRT C. CALDWELL

DR. LEE DEFOREST, the noted radio inventor, scored another victory in the courts when he recently had two patents, numbers 1,507,017 and 1,507,016 granted, establishing him as the first person to make application for the well-known oscillating

Regeneration His Invention, Not Armstrong's, U. S. District Court Holds

and feed back circuits generally credited to Major Edwin H. Armstrong, to whom patents for the same circuits had been granted in October, 1914. The decision was handed down by the U. S. District Court.

This latest decision, coming after ten years of bitter legal wrangling, means that the Armstrong patent, which has become famous because of the fortune both Armstrong and the Westinghouse Company made on it, practically is voided, the laws of the United States covering this point under a statute concerning interfering patents, unless the decision is reversed on appeal.

Many millions of dollars are involved by the issuance of these new patents to De-Forest. The American Telegraph and Telephone Company is now the sole licensee to DeForest and the seventeen lucrative licenses issued by Westinghouse under its Armstrong license thereby killed.

DeForest does not intend to stop these seventeen manufacturers from continuing to make regenerative sets if they so choose, and the A. T. & T. Co. and the trust including the General Electric, Wireless Specialty, and the Radio Corporation of America cannot stop them on their own accwithout DeForest's consent, which the latter's attorney says will not be given!

Radio World's 1-Dial Set Better Than Neutrodyne, Says Doctor

RESULTS EDITOR:

I HAVE not missed a single copy of your magazine for two years. I have

In First Tuning in He Gets 1,000 Miles on Speaker

hooked up on an average of one circuit from each number, the last being the Solodial set described by Herman Bernard in the August 23 issue in an article entitled "A 1-Dial, 1-Tube DX set." When you stated your belief that this was the best 1-dial set yet, you only stated a half truth. I trust my experience will be of sufficient interest to you to be passed along to others. I had a set from which I had removed the detector circuit and I also had two spider-web coils, all wound on cardboard, one of 45 turns and one of 10 turns. From these I removed the forms, cutting them away as Mr. Bernard recommended. To save winding more (of course I was in a rush) I mounted them about ¾ inch apart in the set and hooked up the two stages of audio already wired. This took me about forty-five minutes. Then I tuned in on the loud speaker WNAC, WBL, WJZ, WGY, WTAM, WGN (Chicago), WOR, WDBH, WGI, CNRO, WMAF, WSAI and then WHAZ, after WGY was off. In addition I got stations too numerous to mention on the phones. I tried both the crystal and the leak in grid lead. In my case the leak and condenser work better. Now comes the surprise. I took the set off the table and put on my old stand-by, a 5-tube Neutrodyne, and if anything the little set was better. You can bet one thing and safely, and that is that your circuit stays put.

DR. F. E. BOWMAN,
17 Prospect Street,
Cambridge, Mass.

* * *

RESULTS EDITOR:

IN the February 23 issue of RADIO WORLD there was published a diagram of a reflex set to be made from a vario coupler-variometer regenerative set.

Well, wishing to experiment, I went to a chain store and bought the parts, including the audio transformers.

The first time I tuned in I got Northfield, Minn., and the Crosley station at Cincinnati. I was using two 3½-to-1 trans-

Coast to Coast on Horn with 3-Tube Set

formers at that time. My antenna was 150 feet long.

I was interested in another circuit and so tore down the reflex and built a 3-circuit set. I got good volume on that with a C 11 tube. Last week I decided to build a very complicated antenna, total length 50 feet, containing 200 feet of braided enameled wire with 30-foot lead in.

I hooked up a set that was built of Bremer-Tally parts, using a C 299 tube as detector and a UV 199 in one stage of audio.

This was a No. 3 B.T. hookup, and one stage of audio. Last night I brought in WEAF with volume through the static.

I rebuilt the reflex set mentioned in the first part of this letter, using the same parts, except a 9-to-1 audio transformer as T 1 on diagram instead of 3½-to-1.

WHB was in the air and I tuned in on him. The volume was so great it nearly knocked me off the stool. UV 199s were used and 45 volts on the plate. In a few days I am going to try higher plate voltage and see what I can do.

I appreciate your magazine and the circuits you publish certainly work. Good luck to you. Yours sincerely,

E. S. PENNY,
2106 Cleveland, Kansas City, Mo.

RESULTS

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:

I CHANGED my single-circuit regenerative set to a 3-circuit at a cost of $.00, as described by Herman Bernard in the August 2 issue of RADIO WORLD.

I now cover the wavelength band much better. The set is so selective that I can tune out two stations within one degree. Volume is slightly cut down, but the results warrant a sacrifice in volume. Two steps of audio work the loud speaker fine. The best and most remarkable thing is that I caught KGO, Oakland, Cal., clearly and distinctly on the loud speaker. This is nothing short of phenomenal. This was practically coast-to-coast reception. DX weather hadn't come in yet either. What do you think of this for real DX?

LIN S. FELDER,
P. O. Box 23, Orangeburg, S. C.

Programs

Tuesday, September 15 (Continued from page 19)

organ recital. 6:30 P. M., Hotel LaSalle orchestra. 8 P. M., Harry Hanson, literary editor. 8:20 P. M., Miss Clara E. Laughlin, travel talk. 9:15 P.

Wednesday, September 16

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—8 P. M., farm address by a faculty member of the Missouri College of Agriculture. 8:20 P. M., barn dance program by Ernest R. Taft.

KPO, San Francisco, 423m (710k), P. T.—1 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M., Garry Fisher's Amphians; 4:30 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 5:30 P. M., children's hour stories by Big Brother of KPO. 7 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 8 P. M., E. Max Bradfield's Versatile Band; Baron Keyes, composer, playing and singing his own selections; talk, "Thrift in Education for Your Boy and Mine," by Wm. T. Elzinga.

KGW, Portland, Ore., 492m (610k), P. T.—11:30 A. M., weather forecast. 3:30 P. M., talk by Jeanette P. Cramer, home economics editor. 7:15 P. M., police reports. 7:30 P. M., baseball scores, weather forecast, market reports. 8 P. M., concert by Western Union Telegraph Co. 10 P. M., dance music by George Olsen's Metropolitan orchestra.

WHAS, Louisville, Ky., 400m (750k), C. S. T.—4 P. M., selections by the Alamo Theater orchestra, Harry S. Currie, conductor; police bulletins; weather forecast for Kentucky, Indiana and Tennessee; "Just Among Home Folks"; radings: selected Courier-Journal and Louisville Times editorials; late news bulletins. 4:55 P. M., local livestock, produce and grain market reports. 5 P. M., Central Standard time. 7:30 to 9 P. M., concert by the Kentucky Night Owls, direction of Jake Seligman; late news bulletins; Central Standard time.

WFAA, Dallas, Tex., 476m (630k), C. S. T.—12:30 P. M., musical program by talent from a Dallas theater.

PWX, Havana, 400m (750k), E. S. T.—8 P. M., concert at the Malecon Band Stand by the General Staff Band of the Cuban Army, Lieutenant Juan Iglesias Band Leader.

KGO, Oakland al., 312m (960k), P. T.—1:30 P. M., N. Y. and S. F. stock reports and weather. 3 P. M., musical program and Cora L. Williams, institute speaker. 4 to 5:30 P. M., Concert Orchestra of the Hotel St. Francis, Vinton La Ferrera conducting. 6:45 P. M., stock reports, weather, S. F. produce news, baseball scores, and news items.

KFAE, Pullman, Wash., 330m (910k), P. T.—8:30 P. M., violin numbers, Jaroslav Sotola, accompanied by Miss Zimmerman Fairs, Not Fakers, Lincoln R. Lounsbury; Development of the Practical in Higher Education, by President E. O. Holland; Business of Being a Good Citizen, Rev. Norman McKay.

WMAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sports results. 4:10 P. M., child life story hour. 4:30, musical program. 6 P. M., Chicago theater organ recital. 6:30 P. M., stories for children by Miss Georgene Faulkner, the story-lady. 8:30 P. M., WMAQ "play-night," direction of William Ziegler Nourse. 9:15 P. M., Kathleen Kearney and Thomas J. Coughlin—Irish program. 9:45 P. M., Talk from one of the Chicago charities.

Radio Writers Form Association

(Photo Topics)

THE RADIO WRITERS, an association of editors, technical contributors and editorial staff members of newspaper radio supplements and radio magazines published in and about New York City, was formed the other evening at the Hotel Majestic. Left to right (front and back rows combined), A. J. Casey, American Radio Journal; E. R. Doyle, American Radio Journal; E. W. Hulse, Radio Broadcast; J. B. Brennon, Radio Broadcast; V. C. Poe, Brooklyn Standard Union; A. H. Lynch. Radio Broadcast; M. D. Entler, New York Sun; M. Clements, Electrical Merchandising; W. K. Wing, Radio Broadcast; O. E. Dunlap, Jr., New York Times; S. L. Kahn, Radio Dealer; L. L. Adelman, Science and Invention; W. R. Boehnel, New York Times; G. D. Wardrop, Radio Merchandising; N. N. Bernstein, Radio World; K. M. Swezey, New York Journal; Zeh Bouck, New York World; Lloyd Jacquet, Amateur Radio. Front, Robert T. Morris, Amateur Radio. Rear, Herman Bernard, Radio World; Fred C. Ehlert, New York Sun; Robert Hertzberg, New York American; Alfred M. Caddell, American Radio Association, and E. L. Bragdon, New York Sun.

RADIOGRAMS

THE PRINCE OF WALES, besides his many other hobbies, is also a radio fan. His special private railroad car, "Renfrew," and his ranch in Canada are equipped with sensitive receiving outfits.

* * *

FOREIGN missionary news will be radiocast regularly from station WFBH, New York City, by Rev. Dr. Earnest F. Hall, Eastern District secretary of Foreign Missions.

* * *

COLORED PHOTOS sent by land wires is the latest development along that line by engineers of the American Telephone and Telegraph Company. Heretofore only black and white screenings have been successful.

* * *

DR. E. E. FREE, scientist and writer, has assumed the editorship-in-chief of the Scientific American, filling the vacancy created by the resignation of Austic C. Lescaboura, who will be a corresponding editor and have supervision of the radio department.

* * *

THE FRENCH GOVERNMENT has stopped radiocasting from the Eiffel Tower, and instead will send out French propaganda, according to a recent report. The music from Eiffel has been the chief factor in popularizing radio among the French.

MAKING A LOW-LOSS RF COIL, by Neal Fitzalan. Dispenses wtih neutralization. Send 15 cents for Sept. 6 issue or start your subscription with that number. Radio World, 1493 Broadway, N. Y. C.

Join the A. B. C. NOW

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 .....

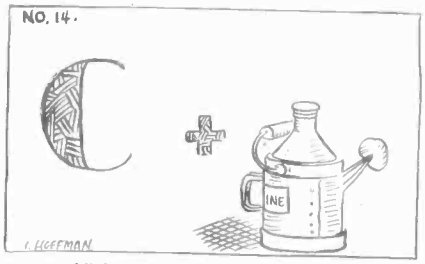
THE American Broadcast Club, formed under the auspices of RADIO WORLD, has for its object the promotion of the welfare of the broadcast listeners of the United States, Canada and Mexico.

Membership is open to all interested in radio in any way, either as broadcast listener, dealer, manufacturer, wholesaler or jobber.

A novel feature of the A. B. C. is that membership entails no duties or obligations whatever. There are no dues. All you have to do is enroll. That will signify your interest in radio and make you one of the thousands unselfishly united in a common interest.

The Weekly Rebus

REBUS No. 14 is published herewith. Rebuses Nos. 1 to 5, inclusive, were reprinted in the August 9 issue, Nos. 6, 7 and 8 in the issue of August 16. In the August 23 issue, Nos. 9 and 10



were published and a new Rebus, No. 11, was printed, and August 30 No. 12. The names of all those correctly solving the twelve Rebuses will be placed on the Rebus Honor Roll and published. Address, Rebus Editor, Radio World, 1493 Broadway, New York City.

The complete roster of names of those who correctly answer Rebuses Nos. 1 to 12, inclusive, will appear in the Rebus Honor Roll in the Fall Buyers' Number of RADIO WORLD, *issue of September 27, on sale Wednesday, September 24.*

HOOK-UPS FOR EVERYBODY—Henley's 222 Radio Circuit Designs, $1.00, postpaid. The Columbia Print, 1493 Broadway, N. Y. C.

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This Offer Good Until
Sept. 25, 1924

Name .....
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Letters from Our Readers

EDITOR, RADIO WORLD:

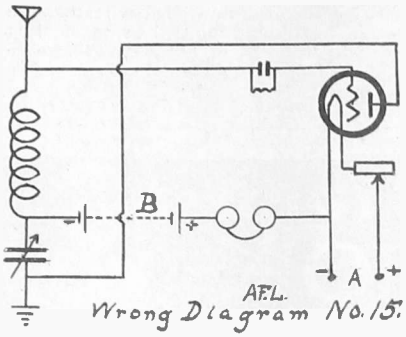
I AM enclosing a money order for a subscription to RADIO WORLD.

I like this magazine very much and have written to several of the radio concerns that advertise in it, for parts, as I feel sure they are reliable or you would not have them advertise in your magazine.

S. W. JACKSON,
413 W. Pike Street,
Canonsburg, Pa.

WHAT'S WRONG HERE?

THE wiring in the accompanying diagram is wrong. If you find what you think is the error, write to Wrong Diagram



Editor, RADIO WORLD.

THAT GREAT SUPERDYNE CIRCUIT

That appeared in RADIO WORLD dated May 17, 24, 31, 1924, aroused so great an interest that the entire supply of those issues has been exhausted. The Editors, therefore, decided to bring the articles strictly up-to-date, and the Superdyne Circuit was, therefore, fully covered in descriptive story and diagrams in RADIO WORLD dated Aug. 23 and 30, 1924. These two copies sent on receipt of 30 cents. Also the July 5 issue contained an article about "Trouble Shooting for the Superdyne"; mailed on receipt of 15 cents. RADIO WORLD, 1493 Broadway, New York City.

DX SET

(*Concluded from page 14*)

over one not low-loss.

Now, to reduce the inductance, if need be. Remove one turn at a time. Then test. If 526 meters comes in around 90, well and fine. If not, remove another turn, and keep up the good work until you strike the balance. The reduction of the amount of wire is accomplished by cutting the end of the coil with shears. For instance, cut away the one foot of slack. Now cut the last turn of wire at every point where it is tied. That will make thirteen separate pieces of wire cut away to reduce the coil one turn. The reason for adopting this method is to avoid passing the unneeded wire through the binding thread more than once. Just once will do no harm, but if dangling wire were pulled through in long stretches you might destroy the rigidity and security of the coil.

LIST OF PARTS

100 feet of aerial wire, 50 feet No. 14 insulated lead-in wire, No. 18 bare round connecting wire, solder, lugs, binding posts or terminal strip.
One 4" dial.
One 199 or 299 tube.
One socket to match.
One pair of earphones.
Sixty feet No. 20 DCC wire.
One variable grid leak.
One variable grid condenser.
One vernier rheostat.
One battery switch.
One 4½ volt dry cell (A battery).
One 45-volt B battery.
One 15 or 17-plate low-loss variable condenser.
One 5" x 5" panel.
One 5" x 6" baseboard (if cabinet is to be used, baseboard should be 4½" x 6").
One piece of hard rubber 1" x 3".
One brass angle, 1½" arms.

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS.

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"B" Battery
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$1.90
Now $1.75

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large size
"B" Battery
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$5.00
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large size
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