Radio in the Home

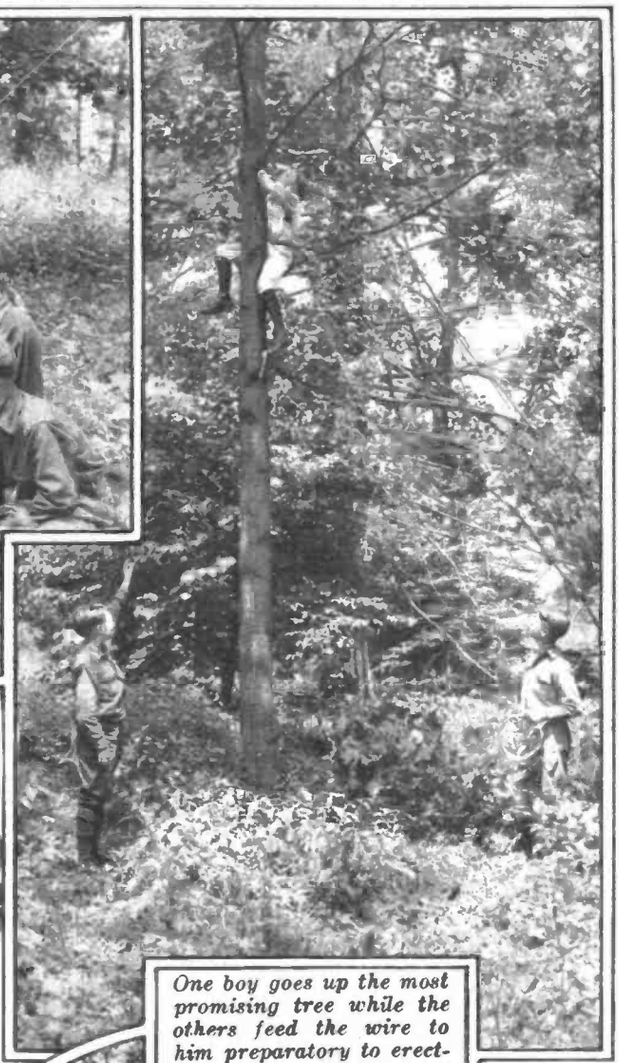
Edited by HENRY M. NEELY

Radio in the Home of E. G. Reyenthaler, of Wynnefield, Pa.
Photo courtesy of N. Snellenburg

JULY 1923

20 CENTS

A radio set makes the best possible kind of feature for the campfire which is one of the delights of the summer-time hike of Boy Scouts. Here is Troop 162, of Overbrook, Pa., with their set all installed ready to put into operation as soon as the evening meal is cleared away. The story of the troop is told on Page 29



One boy goes up the most promising tree while the others feed the wire to him preparatory to erecting the aerial

Late baseball scores are wig-wagged by semaphore to the boys at a distance just as they come in over the radio set

The experts of the troop are charged with the first preliminary tuning of the set to see that everything is all right

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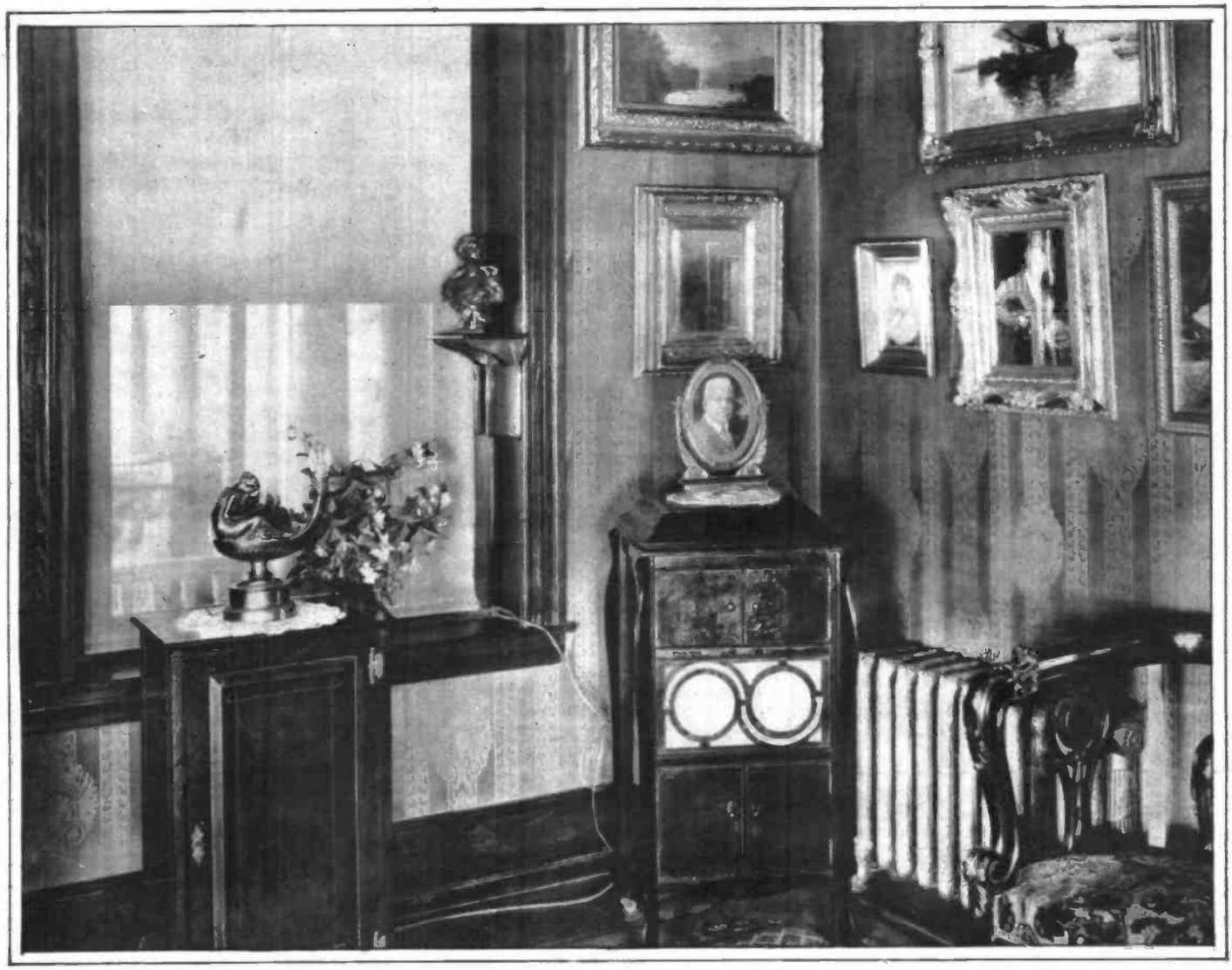

Radio in the home of Frederick J. Michell, of Ridley Park, Pa.
Photo courtesy Wireless Sales Corporation

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RADIO DRAMA

IS IT THE NEW ART FORM?

MORE and more the demand for drama by radio is growing from the vast audience of listeners in all over the United States.

In almost every section of the country, this demand is being met to the best of the ability of the broadcasters by attempting to give standard forms of stage plays by radio, filling in the lack of action in the best manner possible.

Not long ago, before a play thus presented from Station WDAR, Walter Greenough, who has charge of the drama at that station, made a very interesting speech through the microphone, telling his audience of the difficulties of putting out a play in radio form and compensating for the lack of possibility of action.

I was so much impressed with this little talk that I asked Mr. Greenough to let me have a copy of it and he has sent it to me together with a letter from Percival Wilde, the famous playwright.

I am printing both here because I feel sure that they will be of great interest to the radio fans. I am also printing, on the editorial pages of this issue, a few ideas of my own. I should like very much to get your opinion of my opinion.

Mr. Greenough's speech follows:

I WONDER if each of you listeners in realizes that he is one of perhaps five hundred thousand people who have tuned their sets to receive what we are broadcasting tonight!

It's quite appalling to think of, isn't it? I know it's appalling to me and the others who broadcast to realize that we are talking or singing or playing to an audience that it would take four hundred theatres to hold.

The day's issue of several newspapers, the monthly circulation of several magazines is not as great as the number of people who are listening to me hold forth on the magnitude of radio—the tremendous potential power for good and the gorgeous opportunity there is for development, not only of the instrument itself, but of the public who listen in and of the personalities who contribute to its usefulness from the transmission end.

And it will develop and continue to grow. It is useless to point out to you who have already discovered them. many of the obvious ways in which radio is useful. Market reports, time signals. lectures on topics of the day, bedtime stories, music—it's an old story to you, but did you know that the Paris police are using radio to locate criminals, and that our police are rapidly installing equipment?

These developments are taking place almost unnoticed. And radio is still in its infancy.

There are tremendous difficulties to be overcome. and not the least is in arranging suitable programs.

Radio programs entertain thousands of people, yet do not charge for that entertainment.

Radio broadcasting has an enormous circulation and has, of course, a certain friendship-making value for the company that maintains it, but, on the other hand, it is a very expensive form of publicity.

There is the cost of equipment and maintenance of the transmission and control room with its staff of operators, there is the staff of people whose function it is to secure the various kinds of talent that are necessary to the varied program you like. Remember, there are thousands of you and the station can't hope to please all of you all the time; you must each be given some of what you want some of the time. Of course, that's true in other fields. No one reads a newspaper or magazine from cover to cover, and I think all of you have probably sat in a theatre and waited for the end of a song you didn't like because there was a good comedy scene coming —or vice versa.

To return to my subject. Fortunately for the station and for the public, the vast publicity value of broadcasting to a musician, an orchestra or a speaker makes him willing to give his services without direct financial emolument. Obviously, if a station had to pay the artists as well as its already high expenses, broadcasting would either cease or the programs would become monotonous repetition of work by a small corps of entertainers such as you wouldn't want to hear anyway.

And, incidentally, I would like to say that one way for each of you to help to maintain and improve the already high quality of our programs is to write your approval of the things you like and criticisms of those you don't. It is the only way a station has of knowing what its public wants and for the artist to get his applause.

And now to the point of all this.

Recently I have been broadcasting plays for this station—WDAR—and from the response by mail and 'phone they seem to have met your approval. In fact, I am assured that the radio drama will soon become one of the most important elements of a program, if not the most important.

However, as written for the stage—which so far is the only drama available for the radio—we are entirely neglecting some great opportunities that are denied the theatre.

In the old days, the writers for the screen were feeling out ways to tell their stories without the voice.

Today we need people to write plays using the voice alone. There is just as much opportunity for the writer of radio drama as there was for the scenario writer then. There are limitations to the radio form of drama, but there are tremendous opportunities that cannot be found in writing for the stage.

Percival Wilde Is Hopeful of Radio Drama

Dear Mr. Greenough:

I am glad to have your letter of the 15th, and to know that my publishers will be mentioned in future broadcasts of my plays from WDAR.

What you say about the possibilities of radio drama interests me. It is something like the Little Theatre movement, with whose beginnings I had the honor to be connected. Nobody—least of all, the few authors—made any money when it started. The work was pushed because, like the radio drama of today, it was worth while in itself. A few years have seen the Little Theatres intrench themselves, and the authors concerned are now in receipt of rather surprising incomes.

Perhaps the same thing will take place with the radio drama; I do not know. The main thing, as I see it, is to give it a good sendoff. The only return to anybody to date—barring the sellers of radio supplies—has been in advertising, yet this latter has been turned to good account in certain localities. One of the Western department stores, having a book department, has done rather well by displaying the published text with a placard: "WILL BE BROADCAST TONIGHT—BUY A COPY," and has tapped a second source of profit by continuing the display with an appropriately altered placard, on the following day. I pass the idea on to you, as it may interest you, and as I know that my publishers will gladly cooperate. Why people should want to buy the play which they are going to hear or have heard over the radio I cannot explain; perhaps the psychology is similar to that which makes an audience buy the libretto of an opera even when it is sung in English. But since facts are as they are, there is no reason why the book department and the radio department should not play into each other's hands.

I wish that I could hear your performances, but while your station is picked up here, I am unfortunately handicapped by partial deafness, and am compelled to take other listeners' words for it. Medford did one of my plays Saturday and I distinguished only one sentence, though I did a little better when WJZ sent out "The Noble Lord" Tuesday night. So I am afraid I shall have to spend my evenings writing more, and allow everybody but myself to enjoy the performances.

With all good wishes, I am,

Very truly,

PERCIVAL WILDE.

Mr. Walter Greenough,
Broadcasting Station WDAR,
Lit Brothers, Philadelphia.

The play is first read by the cast grouped about the table

Radio characters are not held in one scene or background as they are on the stage. Their conversation can show their progress from one place to another.

They need not be in a lighted room, but can be where it is dark—and action in the dark is in itself dramatic.

Dozens of such instances will suggest themselves to the writer who interests himself in radio drama. Furthermore, a finished radio drama will read very much like a short story. The action continues this out, however, without pauses for description. The character's state of mind and his surroundings must be expressed in the dialogue. The play should be written in from one to three periods or acts of fifteen minutes each.

The radio public will receive any play that is well written and well presented. No one type is necessary, although for the present, dramatic suspense —even a touch of the melodramatic — seems to appeal strongly.

However, humor must be included in radio—as it is found in stage and screen plays. There is humor in life—and there must be humor in representations of life. It took playwrights and scenario writers many years to realize this—and I hope writers for radio will take the short cut to that knowledge.

To those of you who write or are friends of writers, I want to say that every play sent to me care of this station—WDAR, —Philadelphia, will be read, and if available, will be broadcast. When a play is being broadcast, we will notify magazines and theatrical managers of that fact —and in that and other ways help you not only to develop and improve your work but to find a market for it.

You can see that no other known medium would have such power in that direction as a broadcasting station of this type.

Different plays require different treatment, and I think the so-called "literary plays" of the stage will find favor with the radio fan, although at present the instrument is hardly well enough developed to make the listener-in feel certain that he has heard accurately and gotten the full meaning of the speeches broadcast.

If, following a speech, there comes an unduly long pause, the fan often thinks the fault is with this set and changes tuning and loses the dramatic value, which, on the legitimate stage, is enhanced by a pause.

The method of projecting comedy is entirely different. In the "legitimate," when there is a line sure of a laugh, either the actor waits for the laugh to die down or the playwright allows for the noise of laughter by making the following line one that has little importance in the plot. Obviously an important line must not be drowned in the sound of laughter.

However, in radio, particularly with the present loud speaker, there is seldom enough volume of laughter to drown a speech, as each individual horn is used by few people at the same time.

It is surprising how much less actual dialogue is necessary to explain unseen movement than would seem to be required. In the letters commenting on our transmissions from WDAR certain passages I was afraid might not be understood were spoken of as being entirely convincing. An instance of this is in the case of Mr. Criswell's play, "The Secret Wave." In several of the congratulatory letters received, people spoke of their excitement during the wild ride in the automobile.

In writing radio drama a thought

(Continued on Page 29)

They then rehearse it, studying correct distance from the imaginary microphone

Radio in the Home of A. W. Groeneveld, of Chestnut Hill, Pa.

Photo courtesy of General Radio Corporation

THE demand of vacationists for small and compact radio outfits that can be taken around on motorboats or automobiles and will yet deliver good results on a loud speaker has given us some very interesting experiences out at station 3XP.

We have been trying out all sorts of circuits at our test station in order to give you the benefit of the latest ideas in radio, and these circuits, developed by others and merely tested by us, have impressed upon us the marvelous growth of radio during the last year.

If you had asked us a year ago to try to develop a circuit that would enable you to use a loud speaker on only one bulb we would have laughed at you and told you that such a thing was impossible.

Here we are telling you just exactly how to do that impossible thing and we are recommending the impossible circuit for the simple reason that we have ourselves obtained surprising results with it.

Last month we gave you the result of one of our experiments in the article on the Grimes circuit which uses three tubes, employing two of the tubes as audio frequency and radio frequency amplifiers and one of the tubes as a detector.

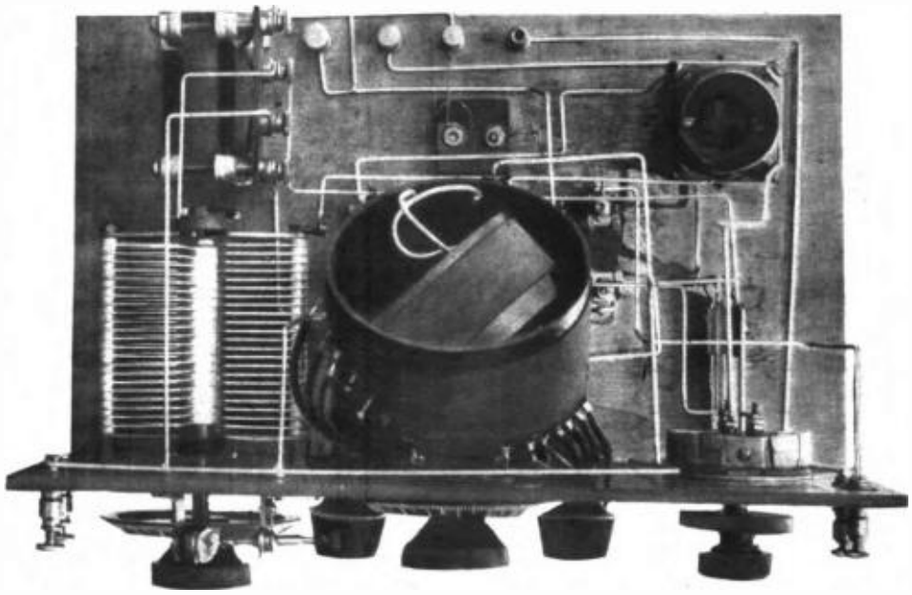
This Grimes circuit is a very fine one, as I said last month, but it is rather expensive and a little too elaborate for the motorboat or the automobile, because it requires three bulbs and four transformers.

I have been reading lately a great many articles on how to build small receiving sets for vacation use, but almost all of these articles have given standard hook-ups which I know from my own experience will not work a loud speaker satisfactorily on a single tube even with a very elaborate aerial installation, and such an installation is out of the question for the small motorboat or the motorcar.

The circuit I am showing here, however, is ideal for both the boatman and the motorist. It is a single tube "reflex" circuit developed by the Electrical Research Laboratory of Chicago for use with its Erla radio frequency transformer.

Mr. Vollten and I tried this hook-up out very thoroughly at 3XP and were really astonished at the results we got. We did not happen to have an Erla transformer in the shop, but we used Federal and Acme and Mu-rad and found that they all gave us splendid satisfaction, though I think it is only logical to admit the claim of the Erla people that their transformer has been developed especially for use with this circuit and will, therefore, give better results in it.

We found that the big advantage in this set is that it requires a very small aerial. It works beautifully on an outdoor aerial, of course, but the regular outdoor aerial is too much for the vacationist.



Looking down upon the Erla circuit mounted

We tried it on loop aerials of various kinds and then, in order to imitate the requirements of the motorboatists and the automobilists, we took a coil of ordinary No. 20 cotton-covered wire and unwound about fifteen feet of it, leaving the rest of the coil still coiled up, and we hung this coiled end over the corner of a picture on the wall.

The results we got with this very short antenna and an ordinary ground were remarkable. With the one tube we were able to put the Philadelphia stations—fourteen miles away—on the loud speaker and hear them clearly all over the shop. Naturally, it was not to be expected that they would be as loud as with the regular hook-ups using three or more tubes, but they were plenty loud enough for the cabin of any motorboat and would be quite satisfactory for the automobilist.

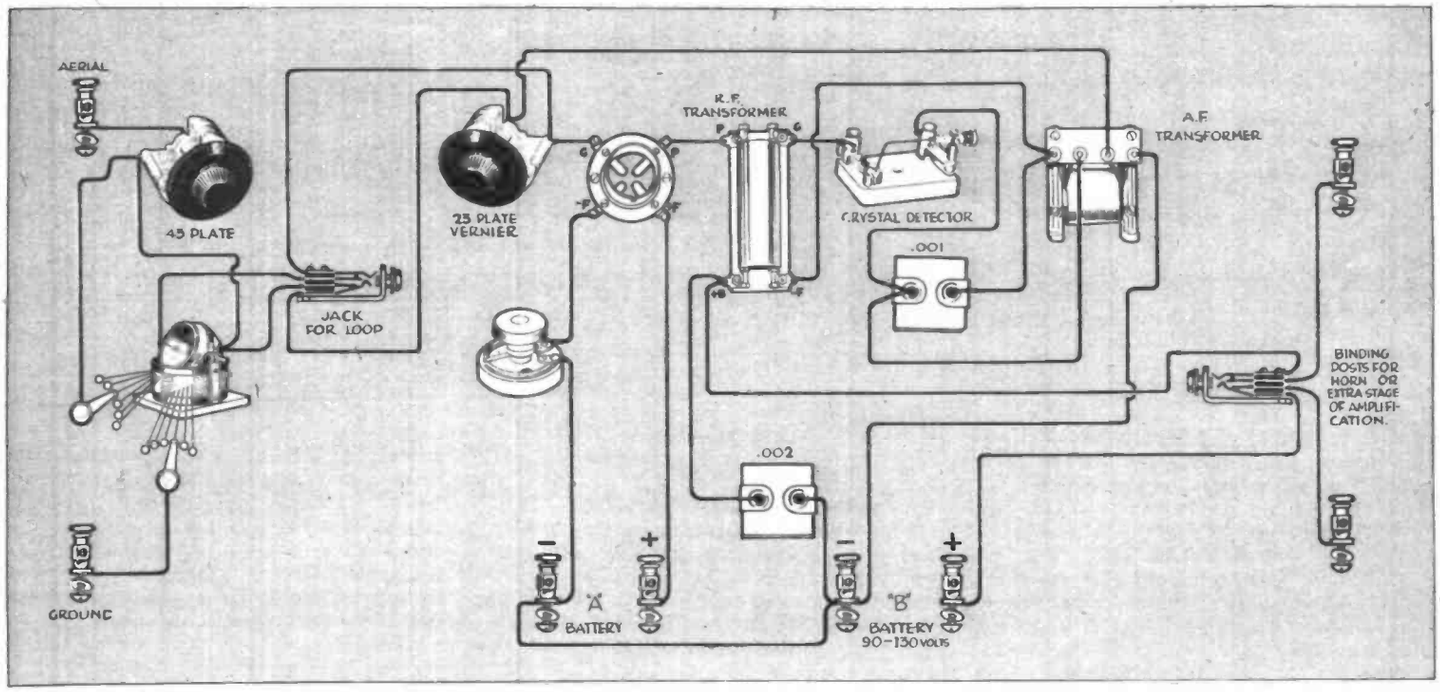
This Erla hook-up does not use the bulb as the detector. It uses only one bulb and employs it first as a radio frequency amplifier, then passes the signals through an ordinary crystal detector, and then passes them back through an audio frequency transformer and through the same bulb so as to build up their strength into signals loud enough to use the loud-speaking horn.

We did not even have to drill a new panel for this outfit, as a little investigation showed it used virtually the same materials as the ordinary single circuit regenerative set which was described in the June issue of *Radio in the Home*, and, as we had an old-time panel on which we had previously mounted that hook-up, we used it for this one and all we had to do with the panel was to drill two little holes to fasten the crystal detector to the front and this might have been avoided if we had cared to put the crystal detector on the baseboard.

In buying parts for this set I cannot too strongly urge upon you the necessity of getting only the very best of material.

When you are asking a bulb to do two jobs at once you must give it all the help you possibly can, and the inclusion of any cheap or inferior apparatus in this hook-up is very likely to destroy the results which you expect.

In mounting this set you must be careful to get the two transformers placed so that their windings are at right angles to each other. Otherwise one will affect the other and will very likely spoil your tuning



This is the complete hook-up for the Erla circuit described in this article

if it does not, indeed, totally destroy reception.

You must also do as neat a job of wiring in this set as it is possible to do and make all of your leads as short as possible, especially the leads to the plate and grid.

Here is a list of everything that is needed in the Erla circuit. Look it over and check off the stuff that you already have and then you will know just what you need to buy:

Four binding posts for the front of the panel and four for the baseboard for battery connections.

One crystal detector and stand.

Two dials. Two switch levers.

Fifteen to twenty contact points for the variocoupler taps.

Two double circuit jacks.

One variocoupler.

One forty-three plate variable condenser with vernier.

One socket. One rheostat.

One radio frequency transformer, any standard make.

One .002 micadon fixed condenser.

We found that we got the greatest amount of signal strength with the UV202 tube with 100 volts of B battery. This 202 tube is one that is not familiar to the usual fan. It is the five-watt tube that is used in amateur sending sets and is a very fine audio frequency amplifier in receiving sets, though it is rather an expensive piece of apparatus.

The UV201 gave very good results, although, of course, not quite so loud as the 202. The UV-201A also works splendidly in this outfit, but you must control your filament voltage and plate voltage very carefully. This 201A tube requires more resistance than is furnished by the average rheostat. We overcame this difficulty by inserting one inch of a piece of lead taken out of a lead pencil in the line leading from the storage battery to the rheostat and that gave the extra resistance required.

We managed to get fairly favorable results on the WD11, the WD12 and UV199 bulbs, although the volume of the signals could not compare with those we got with the 202 and were not quite so good as we obtained with the other bulbs. We also found that the 202 was much superior to some other five-watt power tubes and gave us much better results than the E tube or the 216A. If you have an E tube or a 216A, however, you can use them in this circuit and you will not be disappointed at the results.

I have often spoken in the past about the advisability of soldering all connections on a set, but I want to emphasize it in a set of this kind where you are using radio frequency amplification and especially where you are using the reflex system.

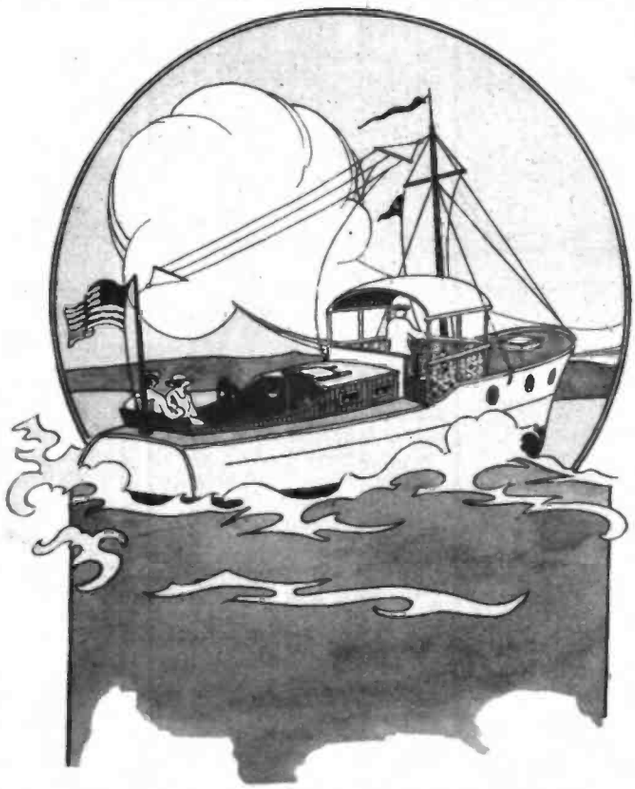
Space your wires as evenly apart as you possibly can and be careful not to cross two leads too close to each other.

At the end of this article I will give the usual "check-up" list so that you can be sure that you have your wiring done right, but first I want to say a few words about what to expect when you start to operate this set.

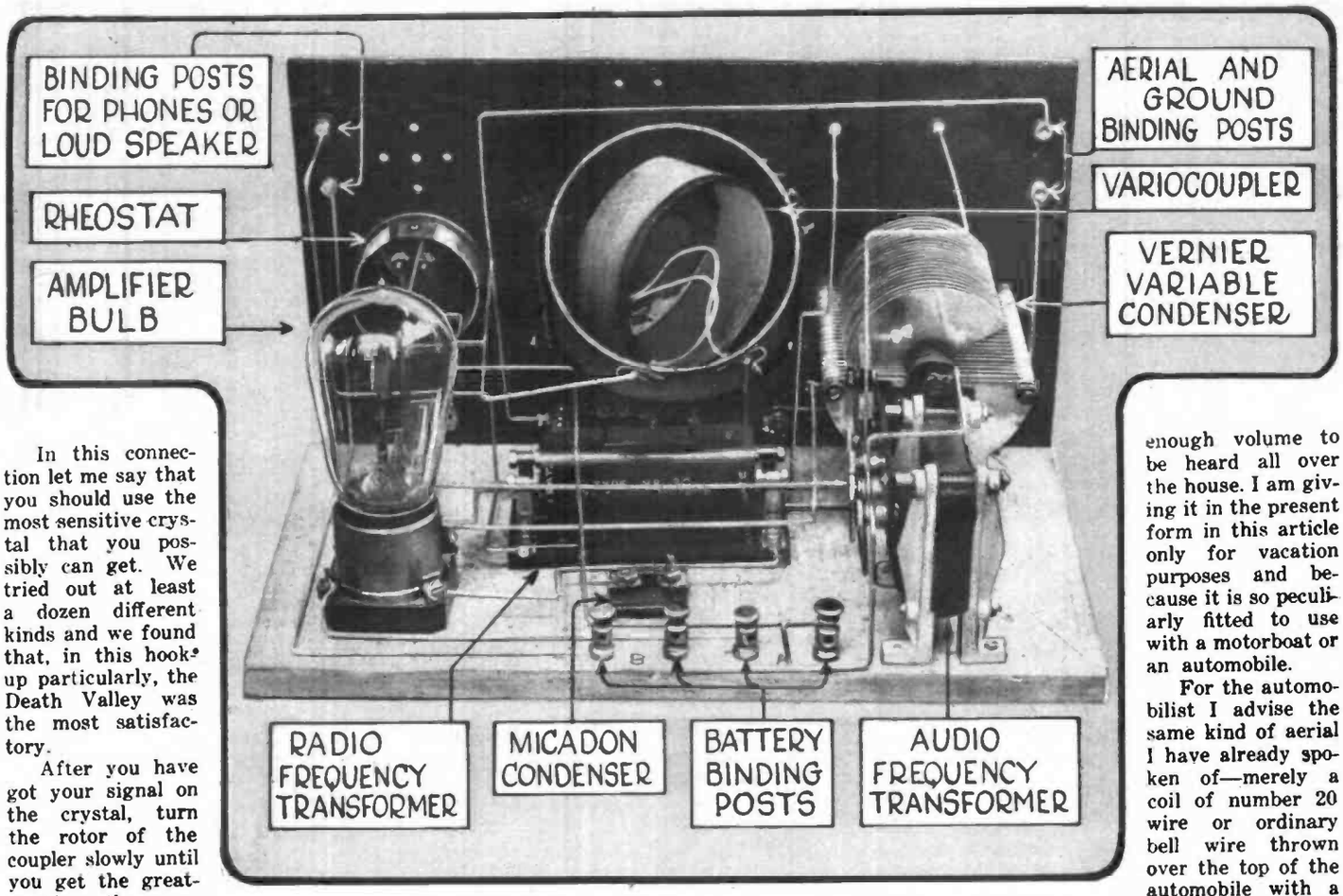
Insert your bulb and turn the filament all the way on. Take the cat's whisker away from the crystal and turn the movable coil of the variocoupler half way around.

When this is done, slowly turn the variable condenser till you hear a whistle. This is probably the "carrier wave" of a station and you should get right in the center of this wave and then place the cat's whisker on the crystal and move it around until you hit a sensitive spot.

You do not need a buzzer tester with this set because the moment you hit a sensitive spot on the crystal you will know it. The signal will jump right out at you and almost make you jump yourself at its suddenness and strength.



With an aerial of 15 to 25 feet, it is ideal for the small motorboat



This is a back view of the Erla circuit mounted

In this connection let me say that you should use the most sensitive crystal that you possibly can get. We tried out at least a dozen different kinds and we found that, in this hook-up particularly, the Death Valley was the most satisfactory.

After you have got your signal on the crystal, turn the rotor of the coupler slowly until you get the greatest strength.

It is absolutely essential when you are turning the variable condenser in tuning this set that you do it very slowly, because the tuning on the condenser is extremely critical and if you attempt to turn it too fast you will go right by the proper spot and scarcely be conscious of the fact that you have passed it.

You must turn the movable plates of the condenser as slowly as possible and as soon as you get a sound, stop turning the main plates and then get more accurate tuning with the vernier.

When you first try this set you will very probably get plenty of howls, but do not get discouraged by this, because they are simply the result of what we call oscillation in the tube and they all stop just as soon as you adjust the crystal properly.

It may take you about an hour playing with this set before you get the hang of it, because there are many different combinations to be made and they must all be made accurately. It only takes a little patience and you will very soon get used to it and it will not give you much trouble after you learn to operate it.

In moving the tap switches you will find that they may change the settings entirely or they may simply increase the signal strength. It is almost impossible to say what they will do.

I always find it a good idea to make a little chart and mark down the settings of the different instruments as I go along.

For instance, I find that we get Station WEAF in New York with the condenser at 20 and the coupler at 46 and the rough adjustment taps at number 4 with the fine adjustment taps at number 6.

Then when we hunt around to see if we can get WEAF stronger, and possibly lose it entirely in the attempt, we know exactly where to put our instruments to go back to it and begin all over again.

The rotor of the variocoupler in this circuit acts to a certain extent as a tickler —that is, it causes a certain amount of regeneration. When you have tuned in a station, move the rotor a little and the signals probably will increase to a point where they will be badly distorted. The best place is just before they get to this point.

In testing out this set with various kinds of aerials I had an experience which I have had with one or two other hook-ups and which shows how extremely sensitive some of this radio frequency stuff is.

I disconnected the aerial and the screw of the aerial binding post dropped out. I picked it up and put it back again with the aerial still disconnected and the moment I touched the aerial binding post with my fingers the signals came in perfectly clear on the loud speaker and only a little weaker. My body was acting as an aerial for the set. I have had this same thing happen to me a number of times with the Mu-Rad set and with one or two others which are superlatively sensitive.

This circuit as given here and with the addition of only one stage of audio frequency amplification would certainly have enough volume to be heard all over the house. I am giving it in the present form in this article only for vacation purposes and because it is so peculiarly fitted to use with a motorboat or an automobile.

For the automobilist I advise the same kind of aerial I have already spoken of—merely a coil of number 20 wire or ordinary bell wire thrown over the top of the automobile with a certain amount of it still coiled up at the far end. The whole piece of wire should be something like forty or fifty feet long and it can easily be carried coiled up for use in this way.

If the automobilist is stopping along the roadside, he can throw this coil up over the limb of a tree, although the tree is likely to absorb a great deal of the energy. The best method would be to run it up over the top of the automobile and leave the coil lying on the far end of the top.

Naturally, in using this set with an automobile, you must get a good ground, and it is advisable to stop some place where the earth near the car is fairly moist so that you can get your ground wire stuck into the damp ground.

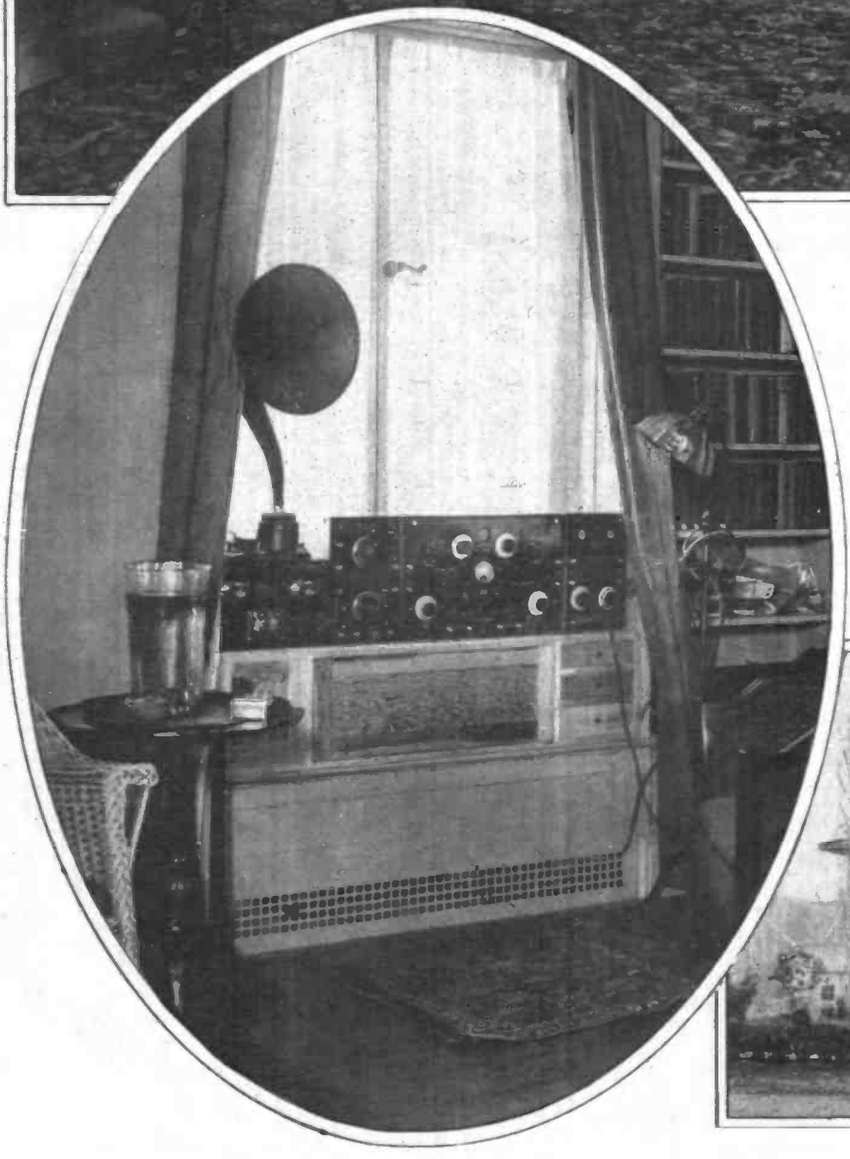
For the motorboatist, even the man with a twenty-five-foot boat, the aerial problem is not at all difficult. My brother is showing a sketch with this article of a hint to the motorboatist for rigging up an aerial. It need not be more than fifteen or twenty feet long, though, of course, if you can get it longer than that so much the better.

The problem of the ground wire for the motorboatist is extremely simple. All he has to do is to drop a wire overboard, leaving a good length of bare end in the water.

Let me give one word of advice to the motorboat fan or the automobilist about using his storage battery with any radio set.

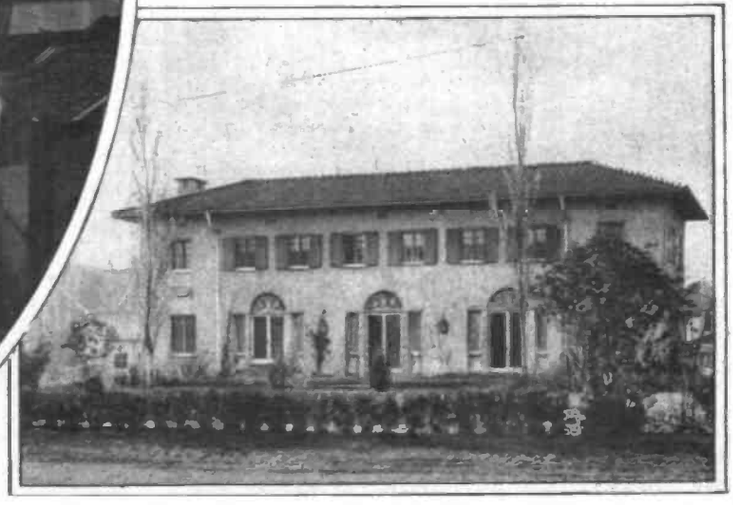
Do not use the battery of your car or your boat for radio unless the battery is

(Continued on Page 27)



Radio in the Home of Merritt Gano, Jr., 110 High Street, Denver, Colo.

Photos courtesy of Colin B. Kennedy Corporation

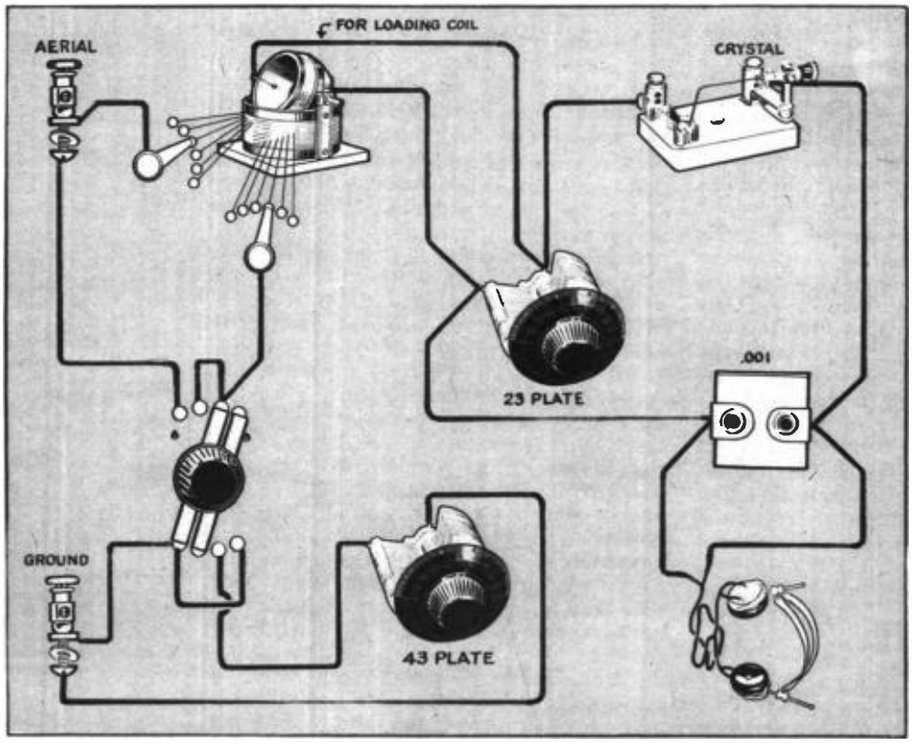


A crystal Hook-up for all Broadcasting Waves

THERE is scarcely a day goes by that I do not get a letter from a radio dealer asking me to include in every issue of *Radio in the Home* a good hook-up for use with a crystal detector.

The burden of these letters is that new enthusiasts are drifting into the stores constantly and that they all want to start with the simple and inexpensive crystal set, desiring to get their first experiences with that before deciding on the kind of bulb hook-up which they will later want to install in their homes.

The old days when the simple crystal set with a minimum of instruments was satisfactory for reception have passed away in many sections with the new allotment of wave lengths.



This hook-up is the best one for the beginner who wants to use a crystal set. The series-parallel switch gives him an unusually wide range of wave lengths

In the Philadelphia district, for instance, there is simultaneous broadcasting on 509 meters and on 395 meters by the big stations, while smaller but desirable stations are working down near the 200-meter mark.

Almost all of the crystal set owners in Philadelphia are very must disatisfied because they find that their sets will not include the entire range of these wave lengths.

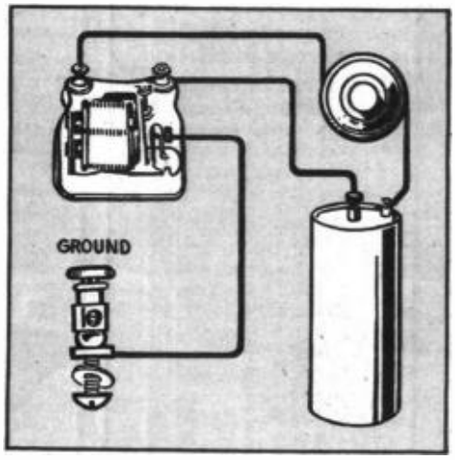
I am, therefore, starting my crystal series with a hook-up which will take care of this very wide range and which will be useful to anybody anywhere in the country.

This circuit is particularly good for the man who has bought a cheap variocoupler. Few of these low-priced instruments are made with sufficient turns of wire to go up even as high as the 395-meter wavelength, and in many sections where the broadcasting is done above 400 meters, the crystal set owner with a cheap variocoupler is simply out of luck.

With this hook-up, however, he can get whatever wave lengths are being used in his section, because this arrangement will take care of everything between 200 meters and about 600 even with a cheap variocoupler or a home-made coupler that has not many turns of wire on it.

This is made possible, first, by the two-bladed switch shown in the lower left-hand corner of the diagram. This switch is what we call a "series-parallel" switch and is shown in another article in this issue of *Radio in the Home* in connection with the Goodman spiderweb coil hook-up.

Let me say in passing that this same arrangement of the series-parallel switch will be very good for the fan who is using a variocoupler with a bulb for tuning. It will do for him just what it will do for the man who puts this set together with a crystal—it will enable him to get longer wave lengths than he is getting now, because, by means of this switch, the 43-plate condenser which he probably is using now in his ground or aerial circuit can be placed in what we call "parallel" or "shunt" to the primary of the variocoupler, and this will give him a large increase in the possible wave lengths which he can tune.



This is the hook-up for a test buzzer to attach to any crystal set

In this particular circuit as given here the rotor, or the ball-shaped form which turns around inside of the stationary coil of the variocoupler, is used as what we call a "secondary," and this is where much of the trouble comes in with the cheap instruments, because these rotors are usually wound by the gyp manufacturer with only about thirty or forty turns of wire. This is not enough to allow the secondary circuit, which includes the crystal detector and the head phones, to respond to very long wave lengths.

To compensate for this, I am showing a 23-plate variable condenser hooked up in what we call parallel with this rotor, and this will be enough to bring the average cheap variocoupler up in its wave length high enough to take care of something between 400 and 450 meters.

If, however, your local stations are broadcasting above 450 meters or if you happen to have a particularly badly made variocoupler with very little wire on the rotor, I am showing a place marked with a little arrow and the legend "for loading coil," and it is easy for any one to put a small coil of wire in that place to bring him up to any wave length he desires.

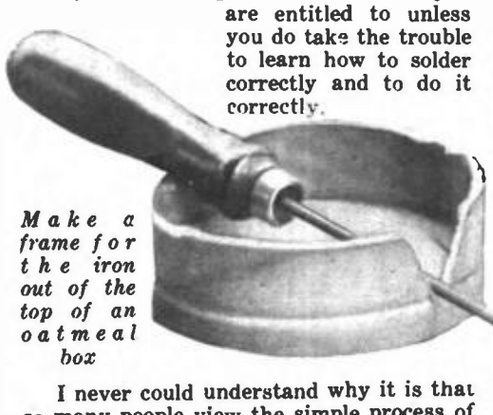
For the man who likes to have everything neat and made by regular manufacturers—and I wish everybody were that way—a 25-turn honeycomb coil inserted in this place will do the trick. In that case you simply cut the wire where the arrow points to it, connect one end with one end of the honeycomb coil and connect the other end of the honeycomb coil to the other end

(Continued on Page 28)

SOLDERING

IT MIGHT be an exaggeration to say that as many as 50 per cent of the failures to get satisfactory reception on home-built radio sets are due to the fact that connections are not soldered. It would not, however, be an exaggeration to say that a very large proportion of such failures are due to that one thing.

In a simple detector set that employs only a crystal or perhaps one bulb it may not be quite so important to go to the trouble of soldering all connections, but when you are putting together some of the complicated hook-ups that are so much the craze today, even with the beginners, it is just as well to warn you in the first place that you will not get the satisfaction you are entitled to unless you do take the trouble to learn how to solder correctly and to do it correctly.



Make a frame for the iron out of the top of an oatmeal box

I never could understand why it is that so many people view the simple process of soldering with so much alarm. If they were asked to solve the theory of the fourth dimension, there might be some excuse for their attitude, but when it comes to doing something that has been done ever since the time of the ancient Chinese, I can't see why there should be so much fuss made about it.

It may be that the popular viewpoint is the one expressed by a friend of mine who said, "What, learn to solder? Not me. If I did, the wife would find a lot more jobs for me to do around the house."

If you are going to get in the experimental field of hooking up radio sets, you might just as well make up your mind to it now that you must positively learn to solder correctly.

Even the beginner of today is not satisfied with the simple detector set that was all that was considered necessary in radio a year ago. The veriest tyro now begins with at least two stages of radio frequency amplification, under the impression that it will be impossible for him to get the much-desired distant signals without it. This article is not intended to remove that fallacy from his mind, but merely to tell him what he should do in case he does believe that he must have radio frequency amplification.

You must understand in the first place that radio frequency amplification is designed to handle electrical currents that are so extremely weak that they will not produce enough energy to make a detector bulb operate the telephone.

With currents so weak as this you can easily realize that the slightest resistance in the circuit is likely to kill them entirely, and if they are killed before they get to the detector you might as well turn down the bulbs and go fishing.

Soldering may not be absolutely essential in sets which employ detector and audio frequency amplification, because the signals which these sets handle are the stronger ones which come in with sufficient power to overcome a certain amount of resistance. But I might say right here that even in such sets as this soldered connections will increase the satisfaction of the user.

With radio frequency amplification, however, you cannot get it too strongly implanted in your mind that soldering—and good soldering — is absolutely essential.

No matter how tightly you may screw down a wire connection, there is a certain resistance in this connection even when it is new and the wires have been scraped nice and shiny and bright. As time goes on, this nice shiny surface begins to corrode with the weather and the skin of corrosion becomes a very decided resistance, and in a short period of time will almost certainly interfere with the operation of the set.

Soldering is a very simple matter. It is nothing but taking a metal that melts at a low temperature and fusing it around another piece of metal.

Most people seem to think that a soldered connection consists of a whole lot of slimy paste with a number of globules of

solder stuck around it like the warts on a pickle.

This is not soldering; it is murder.

To solder correctly, you must use a very small amount of paste and have the solder run all around the joint that you are making.

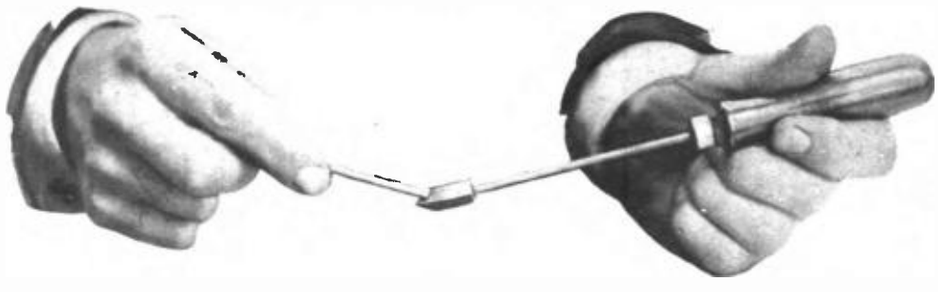
First, let me advise the amateur to use the solder which comes in the form of a wire. If he asks for "wire solder" at the store he will get what he wants.

But be sure to state to the salesman that you do not want wire solder with an acid core. The wire solder with a resin core is all right, but do not use acid around a radio set.

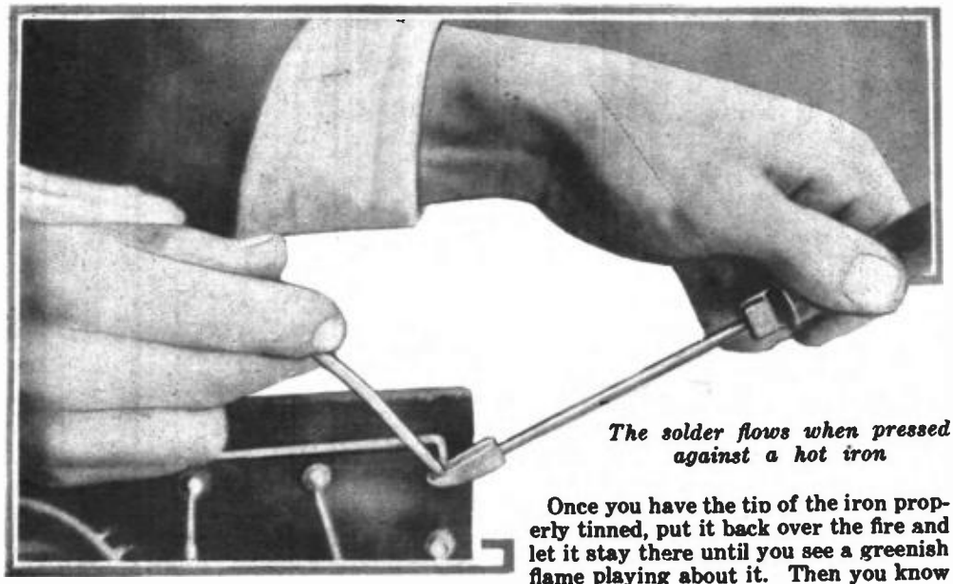
To begin a soldering job, be sure that the two articles you want soldered are perfectly clean and scraped bright. If they are two wires, clean the insulation off first and then with a knife scrape the wires until they are nice and shiny.

Then twist the two ends of wire together as tightly as possible, using a pair of pliers if necessary.

When this is done, apply a very small amount of paste—the smaller the better—then heat your soldering iron either with an alcohol torch or a gasoline blow torch, or, if you are blessed with such a



Get the iron hot and then tin it with the solder



The solder flows when pressed against a hot iron

thing, heat it with an electric torch heater, or, if you have none of these things I have mentioned, you may heat it over the gas range.

An alcohol torch is probably the best for amateur use and it costs only about seventy-five cents. It is an article every one should have around the house, because the ability to do a job of soldering when it is needed is a very valuable one to the man who likes to do a lot of his own work.

The soldering iron is a piece of copper about three-eighths of an inch in diameter and about two inches long. This can be bought very reasonably in any hardware store, and I have seen serviceable ones on sale in the five-and-dime stores which will answer the purpose for a short time, though you must not expect very long life from them.

One of the difficulties in heating the iron over the ordinary torch is that it will persist in rolling off almost anything you put it on. I have personally solved this difficulty in the manner shown in one of the pictures with this article. I simply took the top of an oatmeal box and cut two notches in it. This I set on top of a milk bottle and set the iron in the notches so that the tip of the iron comes nicely over the top of the alcohol torch and only about a quarter of an inch above the wick.

All new irons should be prepared before the first soldering job is attempted.

After you have heated the iron in the fire for a few minutes, remove it and dip it in a can in which you have previously placed a small amount of the soldering paste and some small lumps of solder.

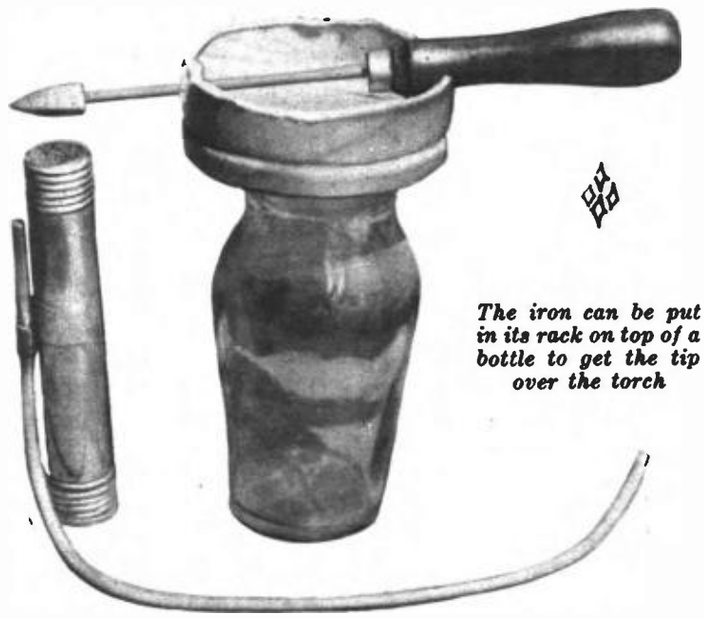
Roll the iron along in this until it takes on a shiny coating of the solder. This is what we call "tinning" the iron and it is an important thing to do.

Once you have the tip of the iron properly tinned, put it back over the fire and let it stay there until you see a greenish flame playing about it. Then you know that it is hot enough to use.

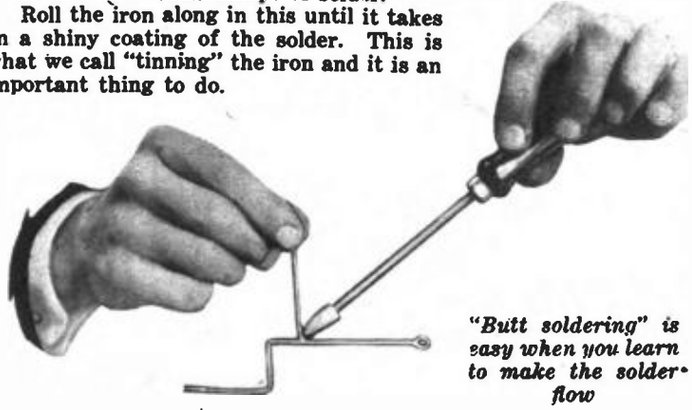
With the tip of a wire or a matchstick put a very slight coating of the solder paste on the joint to be soldered. Then lay the hot iron against the joint so that the flat part of the iron covers the greatest amount possible of the joint. Then, with the other hand holding the solder, apply just a little to the place which is to be joined.

Don't move the iron about, but leave it there and presently you will see the solder run all around the joint. If the joint happens to be a binding post or something large, you may have to heat the iron over again if the solder does not flow the first time.

There isn't anything so difficult about this and a little practice will enable you to do it every time. It really becomes fascinating to watch the solder run all around the joint, in and out of all the twists and turns of wire. You should hold your wires steady and blow on the joint until the solder has hardened, and then you have a joint as strong as is necessary for any radio work.



The iron can be put in its rack on top of a bottle to get the tip over the torch



"Butt soldering" is easy when you learn to make the solder flow

This type of soldering is called "wrapped joint" soldering, because you wrap the wires together at the joint before you solder them. Let us suppose that you want to solder a wire to a plate like the end of a variometer or one of the blades of a phone jack. To do this, apply a small quantity of paste to the plate and take the specially tinned iron and hold it against the plate until the plate is tinned almost the same as the iron is.

Then tin the end of the wire the same way, reheat the iron, place the tinned end of the wire up against the tinned spot on the plate and hold the hot iron against them until the solder on the wire and plate flows together.

Very frequently when you take the iron out of the fire you will notice that it is covered with a dark coating. This is called oxide, and it should be removed before trying to do any soldering with it.

A good way to remove this oxide is to wipe the iron off with a cloth, leaving it nice and bright, or if necessary, take it off with a file. There may be occasions when you have two flat surfaces you want to solder together. To do this, first tin each of them as I have described above, then place them together and hold a very hot iron on the outside of one of them until you see the solder run. This method is called "sweating." Sometimes you have to make a connection in the center of a wire, and to make it look neat we do what we call "butt" soldering—that is, cutting an end of a wire off and soldering it so that it butts up against the other wire.

When you have such a joint to make you should tin the butt of one wire and the lengthwise piece of the other and also tin the point of the soldering iron.

Then heat the iron, hold the butt of one wire up against the other, put the hot iron tip up against the joint and let the solder run in between the two wires. When it does this take the iron away and hold the wire steady until the solder hardens and then you can let go safely because the joint will be strong.

You may think that I am overplaying this matter of letting solder "run," but as a matter of fact that is the whole secret of good soldering.

Almost every one has seen a tinner take a brush and dip it into a bottle containing a liquid and smear it on the roof before

(Continued on Page 29)

Editorially Speaking and

By HENRY M. NEELY

ONE of the most interesting problems in radio broadcasting today is the presentation by radio of theatrical plays. I am printing on pages 4 and 5 of this issue of *Radio in the Home* a speech made by Walter Greenough from station WDAR in Philadelphia just prior to the presentation of one of the plays under his direction from that studio.

Station WGY in Schenectady has been making a great feature of its weekly presentations of dramatic performances, and many other stations have also attempted to cope with the difficulties of giving an adequate rendition by radio of plays intended primarily for stage presentation.

Possibly because of my own experience as a dramatic critic, these plays by radio have been to me among the most interesting experiments of the new art. I have been very glad to see the widespread public response in favor of further experiments along this line, and I believe that this feature of radio broadcasting holds a promise for the future second to no other feature of the radio program with the possible exception of grand opera and symphony orchestra of the very best quality

I have seen many interviews with theatrical people predicting that the theatres will be equipped with microphones in the future so that plays as rendered on the stage will be transmitted by radio to thousands of persons outside of the theatre. I do not believe that this is feasible generally.

The engineering side of the matter offers no difficulties whatever which cannot be solved easily at the present time. But plays as presented on the stage depend so much for their effect upon the vision—so much of the dramatic intent is carried through by action, by gesture, or by facial expression—that straight radio transmission of a play would fail in ninety-nine cases out of one hundred.

Yet I do not believe that the problem of dramatic presentation by radio is by any means an insurmountable one. I believe that it is quite easily solved and that a little experience will soon develop the school of radio playwriting which is very much desired by Mr. Greenough.

My own opinion is that it does not require quite so drastic a departure from the present form of playwriting as Mr. Greenough seems to think. It seems to me that the solution of the new problem lies in the adoption of the very ancient method of presentation of dramatic performances and that that ancient method can very easily be called into service to make a radio play a really satisfying performance without the aid of vision.

Ancient Greece had its "chorus," whose duty it was to describe the action as it was supposed to go on either in the scene on the stage or elsewhere off of the stage.

The old mystery plays had their "narrator," and his duty was the same as the old Greek chorus.

My memory is somewhat hazy as to the definite musical performance that I have in mind, but I distinctly remember one musical service in the Roman Catholic Church in which one chanter gave the story from time to time and led up to the actual chanting of the quotations by other voices impersonating the characters who were in the story.

I am mentioning these things because they all seem to me to point to the solution of the radio drama problem.

What we need in radio drama is not an entire rewriting of a stage play, but an adequate man or woman at the microphone to act the part of chorus or narrator.

Those of us who love to read plays in printed form are quite able to read the stage directions and to picture mentally the action, the gestures and the facial expressions necessary to add force and emphasis to the lines of the dialogue.

The same thing is true of a radio audience providing the play is properly presented in the studio.

It seems to me that it would be quite easy and quite plausible to have a "narrator" in the cast, and his part would be to describe action and gesture and facial expressions wherever it was essential to tie together the various lines of the dialogue into a coherent and complete story.

I have for some time past been testing out this theory by re-reading the plays of Ibsen, of Bernard Shaw and of Oscar Wilde.

I have come to the conclusion from this course of re-reading that almost any of those plays—and they seem on the face of it the most unlikely material for radio drama—could be presented with extreme effectiveness if a competent "narrator" were employed and if the stage directions were changed here and there or knit together or slightly rewritten to take a more narrative form.

From the plays that I have heard by radio, I should say that the principal problem of casting is not in choosing the characters for their dramatic ability, but in choosing them for the difference in their voices as transmitted by radio.

In almost every play I have noticed at least two characters whose voices were so much alike that it was virtually impossible to tell when one ended a speech and the other began a speech.

This must be more carefully attended to if radio drama is to be the success that it ought to be.

The narrator's voice must be the object of special care and attention. There must be no possibility of confusing his part of the performance with the characters.

It is very easy to prove for yourself the possibility of the suggestion that I am making here. I have had it proved to me a great many times in the course of my study of this question, and in every case it has seemed to me to uphold this theory.

If you know some one who is a really good reader, give him one of your favorite plays to read to you. Sit down and close your eyes and let him read the whole play, stressing the stage directions in somewhat different voice from the dialogue, and I venture to predict that you will get a very clear idea of just what action is supposed to be going on on the stage and you will miss little of the intent of the author.

I should like to see more attention paid to the entire matter of radio dramatic performances because, as I vision the future of radio, I can see what a tremendously important part dramatic performances are going to play in it.

I was first struck with the possibility of this idea when, as director of station WIP, I arranged to broadcast the inauguration of Governor Pinchot from Harrisburg last winter.

When we first talked over the possibil-

still Editorially Speaking

ity of doing this there were a great many objections made to spending the money it would cost, not because any one was afraid of spending the money, but because they could not quite see how an event of that kind could be made interesting by radio.

We accomplished it by erecting a glass booth on one end of the Governor's reviewing stand, and in that booth I sat during the entire proceedings and described minutely and extemporaneously, of course, everything that was going on around me.

When a marching club approached, I could see it far down the street, and I began giving as complete a description as possible of the club, telling of the uniforms, the cheers of the people on the side lines, of everything that was taking place, and then, when the band came up closer, I switched in the microphone which was on the Governor's stand, and the audience heard the band coming up the street, the music being faint at first and then gradually growing until, as the band passed the stand, the audience heard the full blare of everything and then heard the band die down again as it marched away.

Then I would take up a description of the next marching club that was in sight, and so we continued the work all throughout the day.

This was entirely experimental, and we waited anxiously to see what would be said about it in the letters which we got at the station.

There were not hundreds, but literally thousands of letters which said, "I could easily imagine myself right there in Harrisburg from the way it came in on my little crystal set."

I am merely offering this suggestion to the broadcasting stations in the hope that somebody somewhere may see in it a germ of an idea which will be better and bigger and which will solve this dramatic problem.

One thing seems to me absolutely certain; that is, that the radio drama is here because there is a tremendously big popular demand for it and that the broadcasting stations must settle down to a very serious study of this question if they are going to keep up with the desires of their public.

* * *

WE were very much amused out at station 3XP the other evening by watching a visitor look through the pages of the last issue of *Radio in the Home*.

He went through the magazine carefully from cover to cover while we were apparently busy at the work bench, but all the while we were watching him out of the corners of our eyes.

When he had finished, he closed the book and said, "Well, so far as I can see, what you fellows are doing in this magazine is to make us poor men want to spend more money for radio."

The spending of more money for radio is not my primary object in getting out this magazine, but I suppose I will have to confess that the accomplishment of my object will actually result in your spending more money. Yet the money viewpoint is not uppermost in my mind at all.

What I am trying to do is to show the public that radio has passed the stage of being merely an excuse for a lot of junk on a rough-looking table up in a corner of the house somewhere where visitors can be taken to see it with many apologies for its appearance and where it is simply pointed to as an example of how clever Johnny is with tools or of the way father spends his spare time in the evenings.

Radio has arrived at a very dignified and important part in the life of the American people. A radio set should not be a shame-faced bunch of junk.

Radio has brought into our homes an element of romance, of awe, of wonderment, which is entirely aside from its entertainment value.

Radio has brought into our homes an entertainment phase of life which was not even dreamed of a year ago.

Radio, accomplishing two such important objects as this, stands ready today to add to our homes that touch of good taste, of nice discrimination in decorative values and the expression of personality which is shown by the furnishings, the hangings, the pictures and other objects upon which the woman of the house gazes with undisguised pride if they have really been well assembled.

The vast majority of the public do not know what beautiful sets are on the market today. This ignorance of the development of radio manufacture is not confined to any one class, but is widespread throughout all classes and all over the land.

Rich and poor alike would be surprised if they could see the real beauty which is added to the genuine efficiency of the radio set put out on the market today by the standard, well-financed and reputable manufacturers.

It is the object of *Radio in the Home* to show to the general reader what radio can do for the home, not only in radio entertainment, but in beauty of appearance and the decorative value of the properly designed and well-manufactured set.

If I were to confine myself merely to written articles telling you that I personally believe that radio has reached this dignified stage, you would probably put my opinion down as the natural exaggeration of an enthusiast.

If I were to tell you that some of the most important and serious-minded business men of the country are sufficiently interested in radio to install it in their favorite rooms in their homes and to give it an equal place in consideration with the piano and the Victrola, the pictures and the furniture, you would again probably think that I was merely weaving dreams based on nothing more tangible than my hopes for the future.

But when I come out with an issue of *Radio in the Home*, showing actual photographs of such sets installed in such homes, with the actual names of the men who own these sets and these homes, there can be no more room for doubt in your mind that what I say about radio's present position is absolutely true.

It is really astonishing how far some of these apparently cold-blooded business men have gone in their belief in radio.

In future issues of this magazine I shall show you photographs of the home of a very well-known financier who has thirty-five different sets and who has spent not only a great deal of money but a great deal of time in keeping a very careful check upon the development of this new art by buying every new set of any importance that comes on the market.

I shall show you photographs of the home

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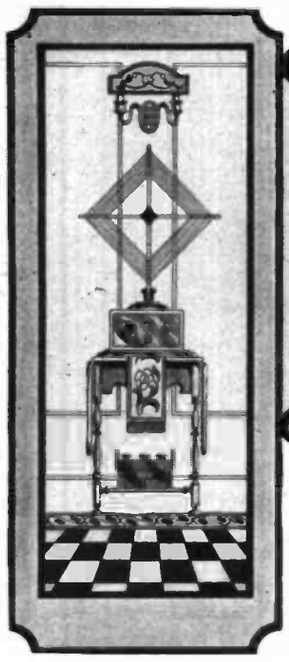
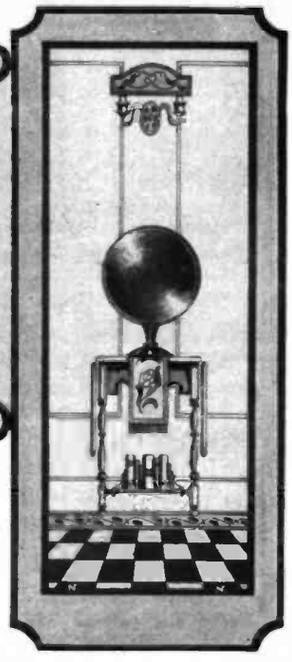


Summertime is Radio Time

By Sidney Lear



Heading by Norman Neely

Drawings by Neely McCoy

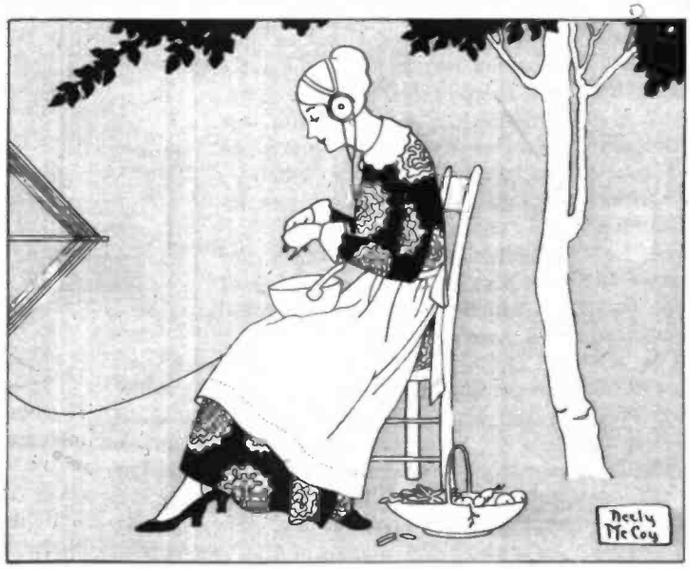
IF Mother has been a wise woman during the last month or so—and Mother is pretty wise during most of the months in the year—Father has been a busy man.

At her instigation, he has been spending all his Saturday afternoons and Sundays—after church, of course — with his tool box and his carpenter's bench. And he has NOT been building a chicken house, or a wagon for Junior, or a new bird box to lure the wrens. He has been making a protective covering for his radio set, so that he—or Mother—can have it out on the porch without having to detach all its connections and carry it all in every night. And he has arranged for a lid with a lock, too, so that there is no danger of its being lost, strayed or stolen.

Then he's been making a loop aerial, too. That is so easy to carry about from house to porch or garden. And Mother wants things easy in the radio line, because most of her time from now on will be spent outdoors, under either the porch roof or the trees, and much of it will be occupied with radio.

Or, rather, to do Mother justice, her occupation will be accompanied by radio.

She has a terrible conscience, has Mother, and she cannot shirk her work any more than George Washington could tell a lie, but even she can see no wrong in making that work as easy and comfortable as possible. And radio is the little helping hand that's going to do that for her.



For example, not even the woman who loves to cook can honestly say a good word for the evil practice of preparing summer vegetables for cooking. Not that any evil would be overcome if they were not prepared. Far from! But it seems a cruel irony that such delicious things as peas should be associated with the frightful bore of shelling them, or that beans should require such careful, tedious de-stringing.

However, the housewife who can put on a pair of ear phones and hear some charming music or entertaining talk, while sitting comfortaby on the porch or in the living room, can forget all about her cobweb parties with the bean-strings, or the millions of peas she has shelled. Indeed, her usually distasteful task will be a nice excuse for her to sit still and listen. And how much more pleasant a humor this will leave her in than forty-five or fifty minutes of sitting in a kitchen that has been baking in the late afternoon sun!

Yes, it's pretty certain that the wires of loop aerials will be as much a part of the summer porch decoration as the flower boxes and the rubber plant this year. It will not be at all unusual, as you ride down a city street bordered with rows of houses equipped with neat, orderly porches, to see the housewife who has made her beds, dusted, and washed her dishes, sitting down in her favorite rocker to make out her order for the day—with a headpiece over her morning coiffure.

her brain cleared for action by some soothing piano solo from a broadcasting station, she can plan the day's menu with ease, think out the week's work, and decide just how she wants that new green gingham made. Rocking gently, she is in a position to catch the cooling before-noon breezes, the greetings of her neighbors as they sweep off their porches, and the postman coming along with the second mail.

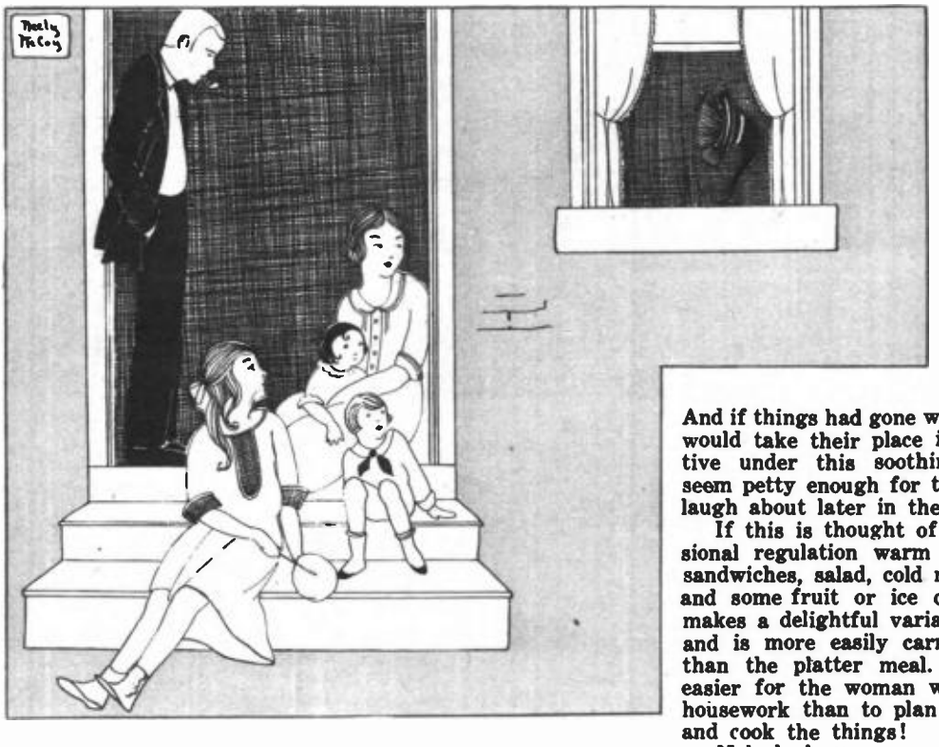
And she doesn't annoy any fidgety neighbor, as she might with a phonograph or a player-piano, either. The sounds she hears are exclusively for her own ears.

After lunch you'll see her again, this busy housewife, who relaxes a bit in summer, but still feels conscience-stricken if her hands at least aren't working.

Rows of her you'll see, in neat, fresh afternoon frock, the morning coiffure dressed into the more finished afternoon and evening one, her feet in pretty slippers, her fingers busily engaged as she rocks her cretonne-covered chair rhythmically. Knitting, sewing or darning those hated stockings — and listening in! It's astonishing how much more quickly and easily the stockings can be put out of the way — all darned — when the darner's mind is occupied and heart uplifted by something that does not take any effort on her part.

She doesn't have to gather up the whole bunch of stockings in her apron and get up to change the record or turn it over when she's radio-listening. Or stoop over afterward to pick up her scissors, and then get up again to chase the ball of darning cotton.

All she does is to find the place for the



best results, settle the headpiece comfortably and sit back. The entertainment rolls in.

The bigger the hole in the stocking, the better she likes it, because she can stay at her post longer. She really feels that she must get those stockings done, and since there's a concert going on she may as well—Johnny may wonder why it is that Mother no longer scolds when he falls out of the cherry tree and splits the knee of his stocking from ear to ear. Radio's the answer. Mother loves wide holes now.

Indeed, nobody would be surprised to find Mother some Monday morning bending over her electric washer with phones on her ears. If she is ingenious she'll be able to rig up an aeriel on her towel rack, or to use the copper wire window screen. Doing one's own housework isn't half bad with the aid of a radio set.

And the servant problem is solved by the possession of a loud speaker. Even the country holds no horrors when the house is always full of unexpected entertainment.

One lady of the house connected her loud speaker on a Friday morning the first week after the arrival of a new man in the kitchen. He was cleaning the second floor that day, and as she sat in the living room, down stairs, unconcernedly concentrating on an intricate new sweater stitch, she heard a strange thumping noise from above. It didn't seem to stop, and, upon reaching the end of a troublesome line of purling, she rose up.

"William!" she called, hurrying to the foot of the stairs, "is that you knocking that way, or is something falling down?"

William appeared around the bend of the staircase, duster in hand, a sheepish grin revealing his fine white teeth.

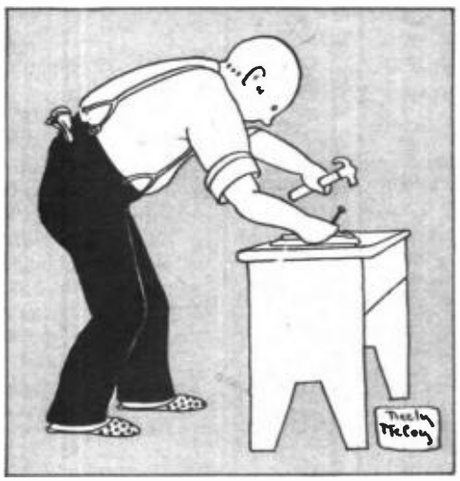
"Yas'm, it's me," he replied. "Ah jes' cain't keep mah feet still when that music's playin!"

Radio has Coue and Pollyanna and all the rest of them beaten ten or fifteen ways when it comes to finding the bright side of housework; it is forever suggesting new ways of combining business with pleasure. Witness the radio porch supper—if you think the evening meal can be called business. It's a necessary pleasure, though, at least.

On a night that can't be called anything but hot, a steaming dinner served in a dining-room that has been under the influence of the warm sunshine all day until it has caught the habit of beaming itself is certainly business and not pleasure. And the woman who has to cook it and then eat it in that hot room will surely be forgiven if her temper is a bit warm, too.

The porch is the only place that's fit to be in at such a time, and the easiest, nicest thing is to serve the dinner as a platter meal on large dinner plates and dine outdoors.

With the aid of a tea wagon this is very little trouble. Bread and butter sandwiches made up in a hurry save plates, knives, a butter dish and bother. Just sweep the magazines and books off the wicker table on the porch, gather about it in nice, wide, easy rockers, and dine in the cool of the evening. You have no idea how restful it is and how simple to do until you try it. The shade or awning let down as far as it will go gives as much privacy as you need. And then, best of all, connect your loud speaker, or bring out all the headpieces you have, and rest your mind at the same time by listening to a concert.



The amiable habit of many broadcasting stations now is to give programs of dinner music at a convenient hour. What a blessing the man of the house would consider his home as he sat there in comfort, sipping his iced tea from a tinkling glass, watching the sun set in glorious color scheme, while a light evening breeze lifted the hair from his fevered brow, and the restful, lilting strains of the "Blue Danube," played by some splendid orchestra, ten, fifteen or twenty miles away, rolled into his ears!

Surely the troubles and worries of the day would seem less annoying under such conditions. And if things had gone wrong at home they would take their place in proper perspective under this soothing influence, and seem petty enough for the housekeeper to laugh about later in the evening.

If this is thought of in time, an occasional regulation warm weather meal of sandwiches, salad, cold meat, a cold drink and some fruit or ice cream for dessert makes a delightful variation to the menu, and is more easily carried out, perhaps, than the platter meal. And how much easier for the woman who does her own housework than to plan a big hot dinner and cook the things!

Nobody knows, except those who have been through it, just how dreadfully wearying it is to start in afresh with the preparing and cooking of a hot meal at the end of a day that has been full of taking care of a house. It is like trying to run a fast race after running a mile to reach the starting point.

Yet radio is helping in this situation as well as many others, for it provides an

opportunity for little moments of relaxation during the day. It isn't always that a woman can leave the house and go to the movies or call on some friend, just to refresh her mind and forget her responsibilities for a while. She'd like to often, but there always seems to be something like the laundryman coming, who has to be paid today, or the cleaning woman, who is new and must be piloted in each branch of the work, the telephone ringing every five minutes or so—and then, anyhow, to go out means putting on street clothes, taking off a torn hair net, smoothing down the hair and hunting up a new hat—it's all too much trouble and takes too much time. She's ready to come back before she gets out of the house.

If she has a little radio set in her

home, even the littlest, crystalest set, she doesn't have to go outside for her relaxation. She can easily get it right there in her living room, or, if Father has made that loop aerial, out on her porch.

Perhaps it is the fact that what you listen to comes from miles away; perhaps it is just the sheer marvel of it — but there's something about radio that takes you completely out of yourself in about three minutes. It rests you as nothing else has ever been able to.

You may be weary, body, soul and mind. You drop into a chair to breathe for a minute or two. The earphones are right there on the table beside you, and little sounds proceeding from them remind you that somebody somewhere is singing or playing an organ or leading an orchestra.

You slip the headpieces over your sleepy, wearied head and the little sounds swell out into full tones, as natural and almost as loud as if you were in the same room with the performer.

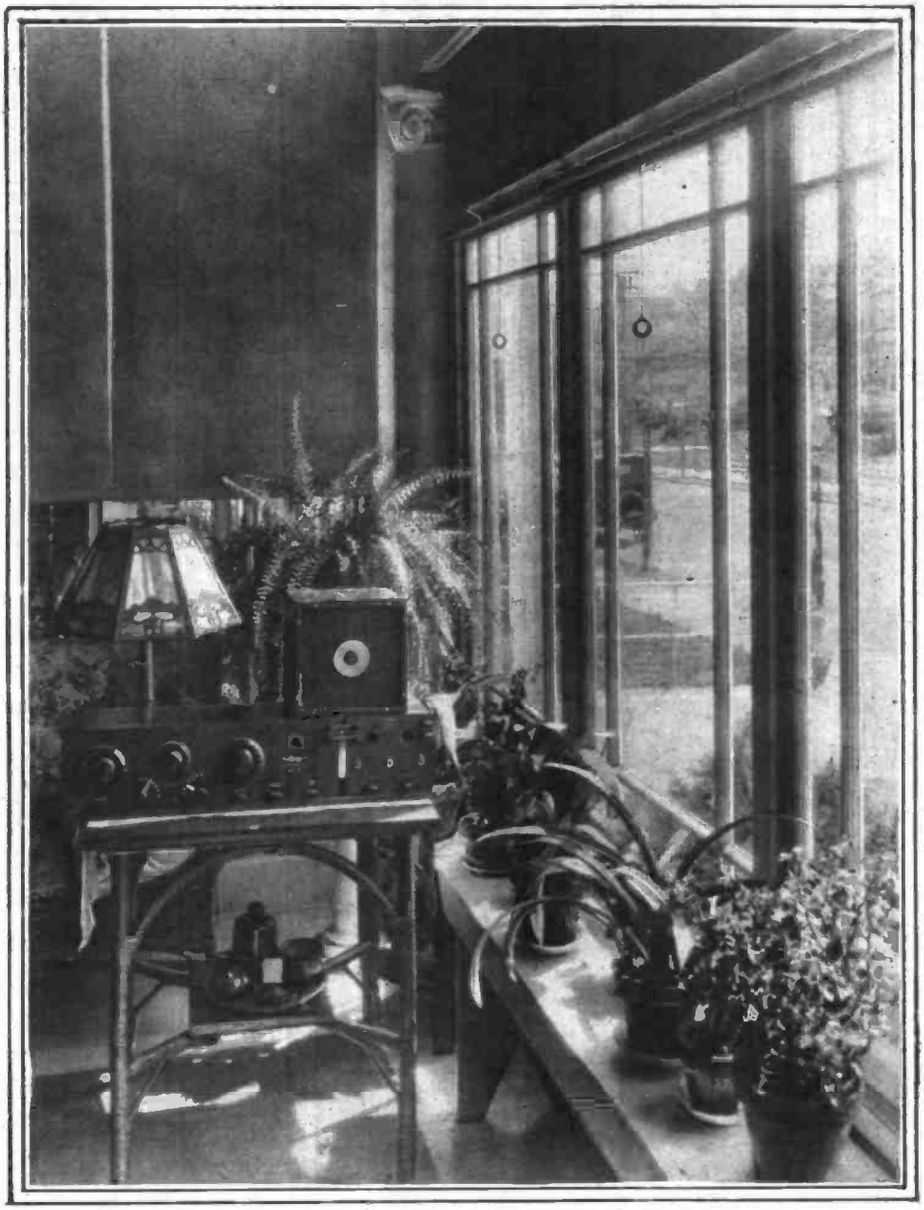
Your depression slides away, your head begins to wave in time to some song that you know, you forget where you are, who you are, what troubled you, and why you were tired. It may be just a few minutes, while you're waiting for the potatoes to come to a boil, or the iceman to come from around the block somewhere with change, but that's enough to lift you out of the depths of yourself and your tiredness and send you back to work refreshed and rested.

The bedtime stories, at which so many grown-ups sniff, are almost as good as a nap at the end of the day. They are the source of many a musical comedy joke and parental snort.

Most elders flatter themselves that they've outgrown that kind of thing.

As a steady diet these half hours for the children would grow tiresome to grown-ups, but as an occasional soothing syrup they are exceedingly effectual.

When the world is a dull, drab, sullen color, with spots of black depression, and you are so tired that you really don't care much whether it ever gets gold or white again, you'll find it very refreshing to sink into an easy chair and hear Uncle Somebody or Aunt Somebody Else talk to the children.



Radio in the home of J. C. Van Horn, of Philadelphia
Photo courtesy Wireless Sales Corporation

"How are you tonight?" asks a sympathetic voice, as you get the earphones in place. That rather surprises you, but you smile rather bitterly at the thought of his or her astonishment if you told how you really were tonight.

"Now, what do you think of this, boys and girls?" the voice continues. "Here's a little girl just one year old who's having a party for her birthday — I hope you're listening in tonight, Elizabeth Jones, and you must come in and see me some time——"

You get a mental picture of little Elizabeth Jones and her birthday party, all just old enough to creep at lightning speed from room to room, all bored to death with the party, and all bursting into tears at different stages of the game because they can't have another sweet cracker. It's an amusing picture, and you smile a little in spite of the weight of your terrible burden.

"Well, now, Jimmy Smith, that was awfully nice of you to send me your picture; and how's Sister Mary, and that nice dog? Well, that's fine!"

You have completely relaxed by this time. Your imagination is taken away from this frightful amount of care or trouble that you've been worrying about, with or without justification, as the case may be, and sent out to all kinds of homes where little radio fans are listening in.

You see Jimmy Smith blush delightedly, turn to Sister Mary and make her giggle with glee; you see a three-year-old, big enough to understand her name, but not quite old enough to do anything but take it all for granted, sitting before her radio set, placidly, with a half tolerant, half pleased expression on her face.

Without realizing the process at all, you are carried entirely out of yourself and away from your surroundings. You forget how tired you are, and the worried frown that corrugated your forehead smooths out with your pleased, amused smile.

When the voice in your ears suggests, with a hint of mischief in it, that it will have to go right along now, "because I noticed somebody yawning over there, and I don't want anybody to fall off to sleep before we have our story even started," you realize that it must have meant you! And you had thought that you'd never be easy enough in your mind to sleep again!

By the time Uncle Somebody or Aunt Somebody Else has sung a lullaby and said good-night you are back to your usual good nature and a bit ashamed of having been so grouchy.

Indeed, the corrective effect of having some unknown voice chide a misbehaving child is very remarkable. With all the talk there has been about the modern child and his headstrong, willful, independent misbehavior, no definite, guaranteed cure has been found. Plenty of them have been suggested, some tried out, but they don't work.

Modern youth seems indifferent tc discipline, scornful of threats or authority, undisturbed by criticism. Or so the reformists and conservatives say.

But it looks now as if the age that brought the recklessness has also produced the cure for it — the radio. Uncle Somebody and Aunt Somebody Else are so much like Santa Claus in so many ways that they are bringing back that state of mind, gone so out of style and use during the last few years.

There's a mystery and charm about having some voice that you know is miles away mention your own personal little name and talk to you about things that no stranger could possibly know. When the voice is grieved because you are doing something naughty that Mother doesn't want you to do and Uncle Somebody doesn't like to hear about, why, if you are anywhere under thirteen, it just about breaks your heart.

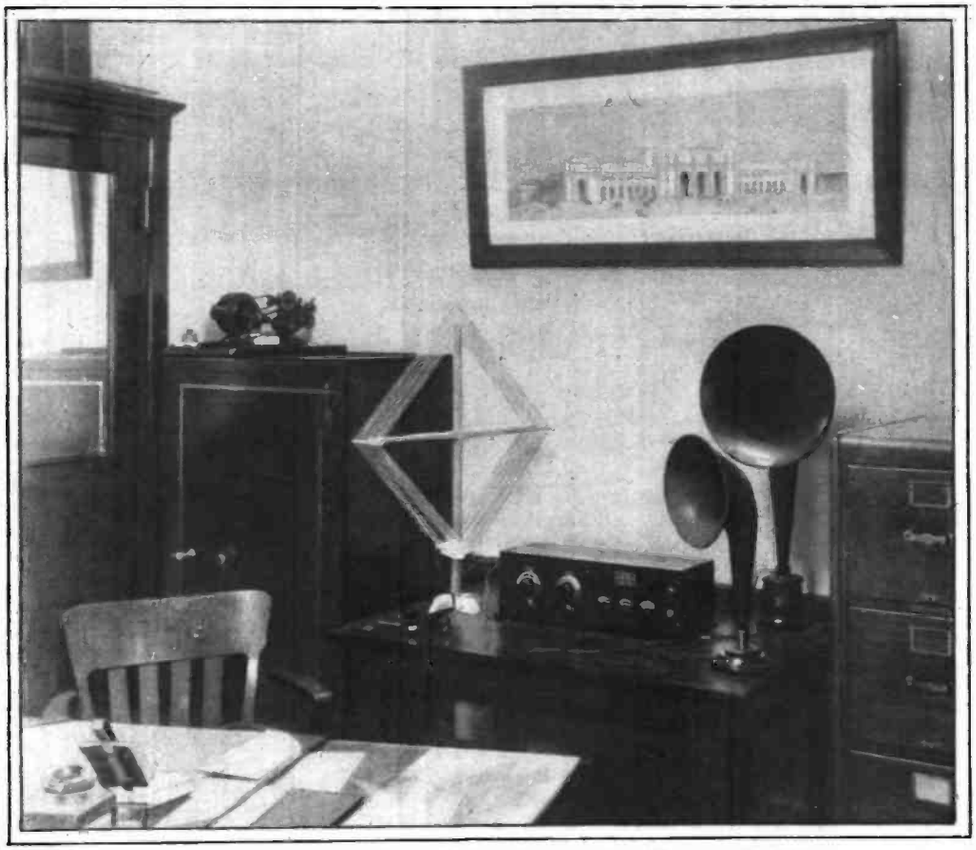
There's the case of Willie Robinson, for example. Willie was a nice boy in every respect but one—he would slide down the banisters. No matter what his mother and father said to him, Willie slid down the banisters at least once a day. And so Mother wrote to a broadcasting station.

That evening Willie listened in, as usual, and was charmed to hear his name mentioned. "How are you tonight, Bill? Well, I'm awfully sorry to hear that you won't stop sliding down the banisters when Mother and Dad tell you to, Willie. I don't like to hear that at all. No, indeed. Why, suppose you didn't hold on tight some time and fell off and hurt yourself, what would you do then? And, anyhow, you know you're a Scout, and Scouts always obey. I don't believe you'll slide down the banister any more, though, will you, Bill?"

Willie's broad grin halted, froze and made a wobbly straight line across his face as the voice went on casually, just as if it hadn't broken a whole heart into little bits of pieces.

Willie knew how the voice heard about that banister business, but he didn't say one word to Mother. His own voice was a trifle shaky and very high-pitched when he turned away to go to bed, and the usual loud protest at going to bed was omitted. He was touchingly casual and indifferent as he got ready for bed, and his response to Mother's

(Continued on Page 31)



Radio in the office of Elmer Zeigenfus, in the Finance Building, Philadelphia

Photo courtesy of Walker and Kepler.

A "Wave Trap" Will Help Tune Him Out

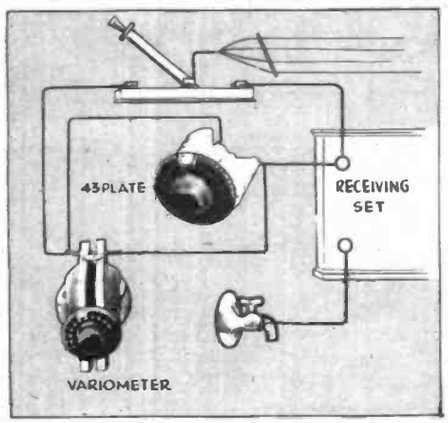
WITH the division of wave lengths making extremely sharp tuning a necessity in the efficient receiving set, radio fans are demanding some sort of apparatus which will help them to make the tuning of their present sets cheaper.

This is especially the case with fans who have the single circuit regenerative set. This set is very efficient so far as getting loud signals is concerned, but it is not particularly good for sharp tuning. It cannot, for instance, eliminate an interfering station if it is within a fairly broad range of wave length of the station desired.

A great many magazines have been publishing so-called wave traps to put ahead of the present receiving set, and these wave traps have all seemed to take the standard form of a fixed coil of some kind hooked up in what we call "parallel" with a forty-three plate variable condenser.

There is a certain amount of efficiency in a wave trap of this kind, but it is not really sharp enough in its tuning to make it worth while. The desired results can, however, be accomplished by substituting a variometer for the single coil in most of these hook-ups.

I am showing in the diagram the best method of connecting up a wave trap of this kind.



This diagram shows how to hook up

You will see that I have put in it a single-bladed switch which can be thrown to the right or left. When the switch blade is on the right, the wave trap is not in the circuit at all. When it is on the left the wave trap is included in the set and the signals go through it before reaching the receiver.

The way to tune to get best results is to put the switch blade on the right, eliminating the wave trap, and tune in on the receiving set until you get the desired station at its greatest signal strength, regardless of your interference.

Then throw the switch blade to the left and tune the wave trap, turning both the variometer and the variable condenser until you get the desired signal there also and, in nine cases out of ten, this wave trap tuning will give you the desired signal and will make the interference so weak as not to be annoying, if it does not, indeed, entirely eliminate it.

Out at Station 3XP we have found this wave trap to be a valuable addition to the ordinary receiving circuit which does not tune particularly sharp, and we are able to get away from most of the interference with it.

If you do not like the looks of the single-bladed switch shown here, it can take the form of an ordinary panel switch lever, such as you have for the taps of your vario-coupler.

This switch lever should revolve over two contact points.

Substituting such an arrangement for the switch shown here, the aerial lead-in would be wired to the switch lever, one contact point would be wired to the aerial binding post on the receiving set and the other would be wired to the first side of the variometer.

NOT long ago I was introduced to a man and his immediate greeting was, "Oh, yes; you're the fellow who is always telling people that they ought to use spiderweb coils." I do not admit that I am "always" telling people to use spiderweb coils, but I am forced to plead guilty to having advocated them fairly strongly all during the past year in the pages of *E-Z Radio*.

I have done this because I have found in my personal experience that spiderweb coils, when properly made and mounted, give about as sharp tuning as it is possible to get with radio and that they are applicable to so many different kinds of hook-ups that it is very well for the amateur with an experimental turn of mind to try them.

There is a famous and favorite circuit with the amateurs of the country using three honeycomb coils. With honeycombs and the usual honeycomb mount these amateurs, who are expert in the dot-and-dash code, can use different sizes of honeycomb coils and get all the wave lengths that are used in commercial radio.

The spiderweb coil is just as good in this same favorite circuit, the only difference being that it is not possible to wind spiderweb coils of sufficient size to get more than five or six hundred meters without having them so big as to be almost impossible to mount on a panel.

I have long wanted to give readers a description of the set which I use myself for my personal receiving set at Station 3XP, and when I tell you that I have this hook-up on the table with my transmitting set and that I use it regularly in my transmitting work and in my radio correspondence with other dot-and-dash amateurs, you need no further proof of my own personal recommendation for the hook-up.

I doubt whether any amateur will want to make his set quite so elaborate as I have made mine, but since the new allotment of wave lengths there has been such a strenuous demand for hook-ups that will tune more sharply that I am giving the complete thing here because I do not know of any set which is capable of more selective adjustment than this one is.

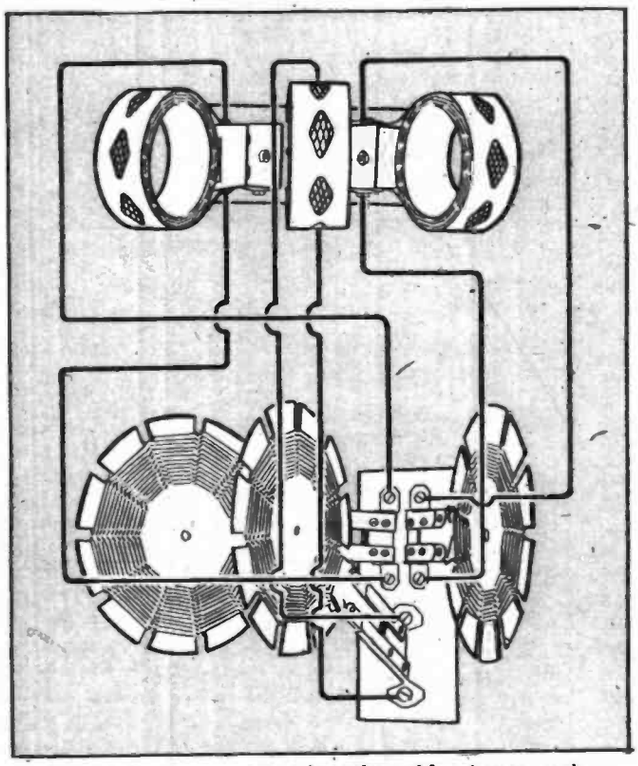
As I have the set mounted on the table at 3XP I make virtually every single part of it variable so that I can make all kinds of adjustment as the occasion requires. All of these variable elements are not strictly necessary, yet I must say that I would not dispense with any of them in my own case because all of them have proved their value at certain times. In my hook-up, as you will see in the photograph, I use both the spiderweb coils and the honeycombs.

I use the spiderwebs for the short wave lengths, which include the amateur transmitters of dots and dashes and also the broadcasting stations all the way up to the highest allotment of the waves now in use.

Some time ago I gave in the pages of *E-Z Radio* a form that I had devised for mounting three spiderweb coils, but I am willing to admit that it was a very crude and unsatisfactory piece of mechanical work. Since then I have been giving a very thorough try-out to the Goodman coil mount for spiderwebs and the fact that I have it on my own set speaks for itself so far as my results are concerned.

This set of mine uses the spiderweb coils for ordinary work and when I want to get some of the longer wave lengths I pull out the spiderweb coils and plug in the large honeycombs, the size of honeycombs depending upon the wave length I want to receive. Thus when I want to get the Arlington time signals direct from Station NAA on 2500 meters, I use honeycomb coils of 250, 300, 400 turns. Other wave lengths come in on different combinations of coils, but these will not be interesting to the average broadcast listener.

I am simply showing the hook-up because there will probably be a great many readers who have become interested in the dot-and-dash code, and I want to say that it is really well worth while to have the honeycomb coil mount also included on your panel because many of these very long wave stations send dot-and-dash code so slowly and so frequently repeat each word twice that it is the best practice in the world to listen to them and try to copy them.



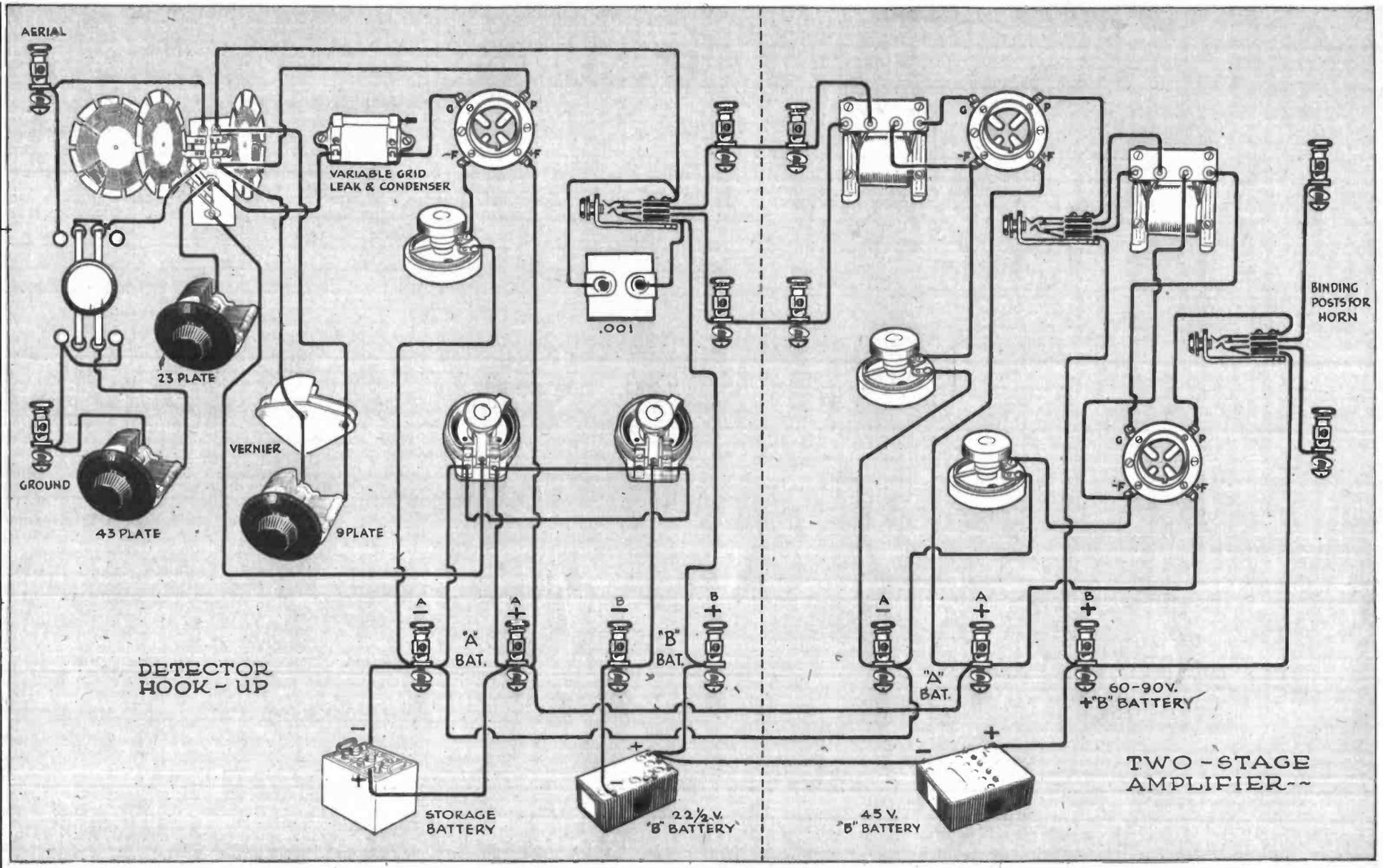
To get the longer wave lengths, add a honeycomb coil mount to the hook-up. The first spiderweb coil is connected on both sides to the first honeycomb coil. The second spiderweb and the second honeycomb are connected in the same way and the third spiderweb and the third honeycomb are similarly connected

In the diagram on Page 21 giving the hook-up of this set, I show only the Goodman coils because I do not want to confuse the amateur who wishes to use this hook-up only for listening to broadcast concerts. In another diagram, however — the smaller one on this page. I am showing the method of adding the honeycomb coil mount. To use this smaller diagram, you simply connect the Goodman coils as shown on the full page diagram on Page 21 and then, in addition to those connections, you put the connections to the honeycomb coil mount shown in the smaller sketch on this page.

If you are using both of these mounts, do not have the honeycomb coils plugged in when you are using the Goodman coils and do not have the Goodman coils in when you are using the honeycombs. Use either that you wish but not both at once.

This hook-up will introduce many beginners to a double-bladed switch which we call a "series-parallel" switch. This is the switch that revolves over two

(Continued on Page 22)



This is the complete hook-up for the Goodman spiderweb coils with almost every piece of apparatus made variable so as to allow for the very sharpest possible tuning. This is no set for the novice to handle, because it means that every single element in the hook-up must be in perfect balance in order to get satisfactory reception, but a little practice will enable the amateur to get splendid results with it

With the Goodman or the Turney or any spiderweb coils used in this way the tuning is about as sharp as is possible in radio at the present time and almost any degree of selectivity can be had after the operator becomes sufficiently experienced.
These spiderweb coils will take care of all of the amateur and broadcasting wave lengths, even up to the 600-meter wave lengths used by ships for commercial traffic

For the man who wants to get the longer wave lengths, particularly the great transoceanic stations in Europe and the stations in the Canal Zone and South America, a honeycomb coil mount should be added by means of the diagram shown on the opposite page
All the other elements in the hook-up remain as shown here. The honeycomb coil mount is simply added to the Goodman mount in this diagram

(Continued from Page 20)

sections of four contact points each, and it is shown at the left of the diagram.

It is not only in this hook-up that a series-parallel switch is a great convenience. In fact, with the new wave lengths and with some of the broadcasting stations going up as high as 509 meters and with others going down in the 200 and some-odd meters, such a series-parallel switch ought to be installed on every receiving apparatus in the country.

The great advantage of this switch is that it compensates for any lack of turns of wire in whatever coil you may be using as your tuning device. It also compensates for too much wire in case there is too much on the coil.

With the switch wired up as shown there in combination with the first coil (the first one is the primary and the same principle holds with any coil you may be using, particularly with the variocoupler) with the switch wired up in this way, you place the upper blades of the switch to the left and your coil is in what we call parallel with the variable condenser, and that increases the natural wave length of the coil. When the switch blades are placed upon the two middle contact points, the variable condenser is in what we call series with the coil and that reduces the natural wave length of the coil alone.

When the two upper switch blades are shoved all the way over to the right, the condenser is cut out entirely and we are using the coil alone with its natural wave length.

In this way any coil can be used for its own wave length or for wave lengths above or below its normal.

I advise any one who has any kind of a coil and a variable condenser in his tuning circuit with any of the standard hook-ups except the Gibbons hook-up, to install this series-parallel switch, using the diagram here given whether he intends to use the three spiderweb coils or not. The connections can easily be figured out if he will simply regard the first spiderweb coil in this diagram as his own primary coil, and the first variable condenser as the one he has now in his set.

The two potentiometers shown in this hook-up are not of very vital necessity for the man who merely wants to listen to broadcasting stations which are near to him and the signals of which come in very strongly. They are of particular value in getting distant stations and I find that, when a faint signal comes in with a little too much whistle or too much distortion to be quite intelligible, a slight adjustment of one or both of these potentiometers will clear it up and enable me to read it distinctly.

The same thing applies to the variable grid-leak. It is not of particular importance with strong signals, but it shows its value when there is that tense moment that comes when a little buzz or whistle keeps you from getting the sign of the man at the microphone several thousand miles away.

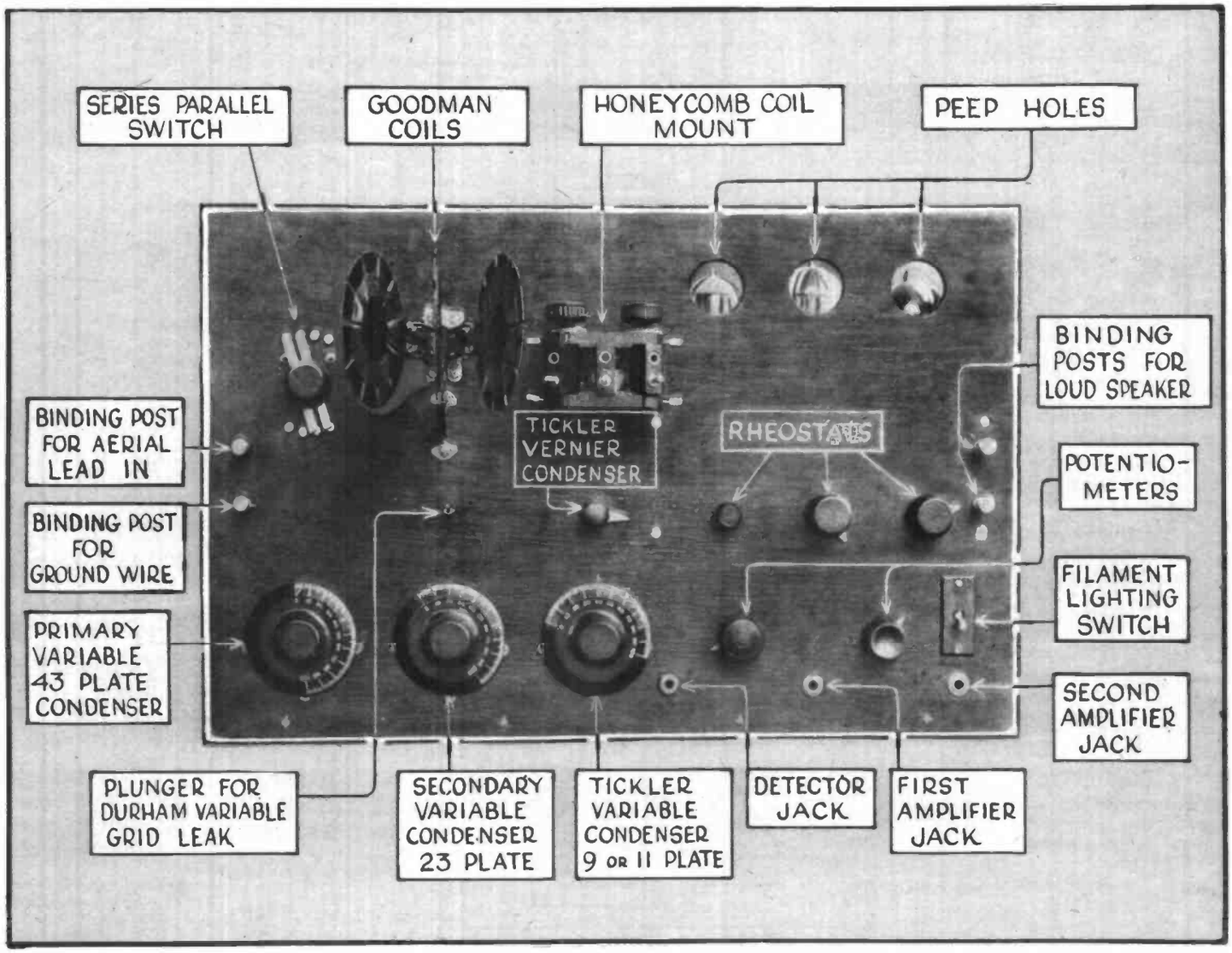
This, too, is the case with the little vernier condenser shown in connection with the variable in the circuit of the third coil. This coil is known as the "tickler" and it is by means of it that we control the "regeneration" in this circuit and get the strength and clearness of signals which we want.

By means of this little vernier condenser I have frequently been able to separate two stations which were within a very few meters of each other in wave length.

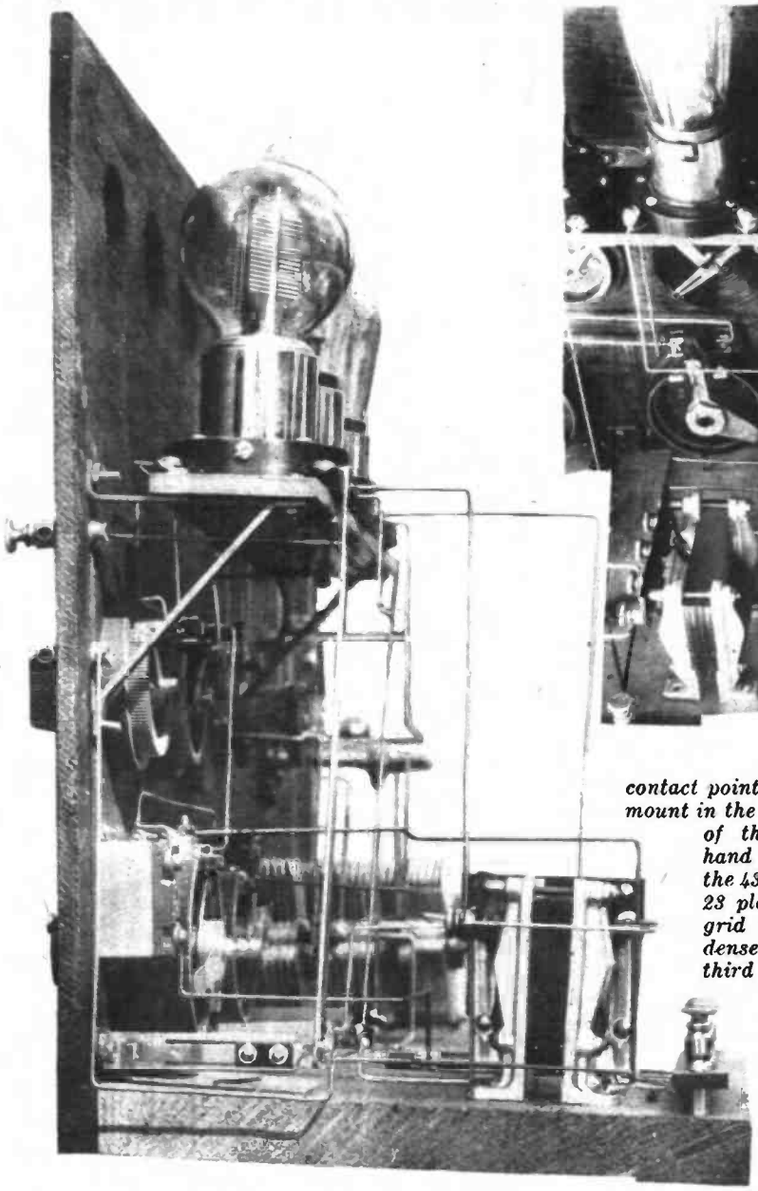
On my own panel I use a miniature variable condenser which is known as the Chelten, but, in case you cannot get one of them, any three-plate vernier condenser will do or you can use a regular variable condenser with a vernier attached, though I personally prefer the separate vernier.

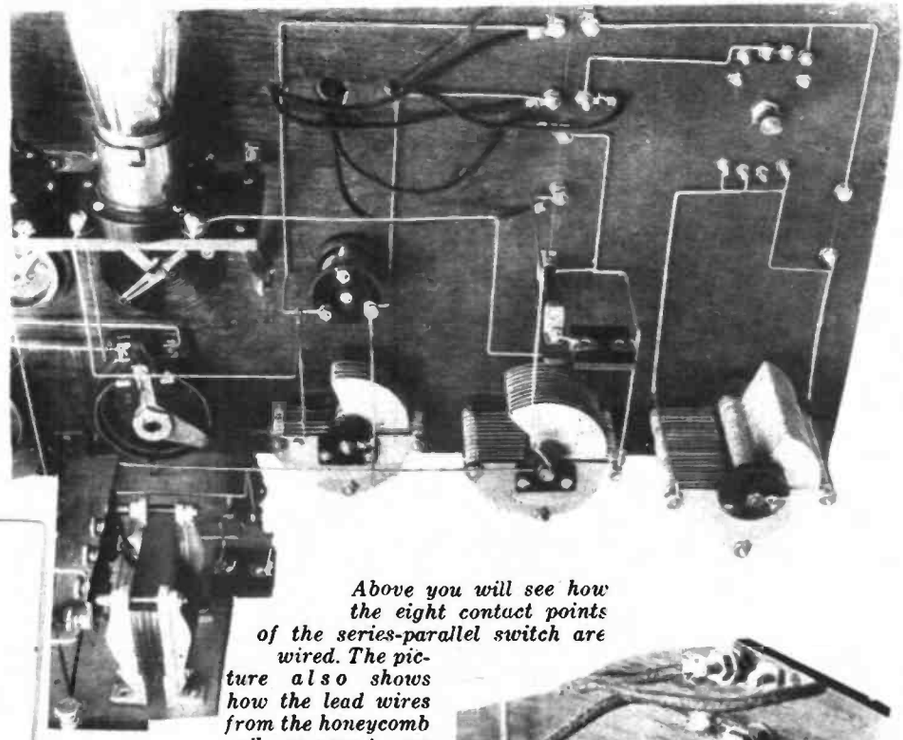
In tuning this set, the most important work is done by changing the relative positions of the three coils with reference to each other. The center coil, or secondary, is stationary, but the two other coils—the primary on the left and the tickler on the right—are movable on hinges.

(Continued on Page 28)



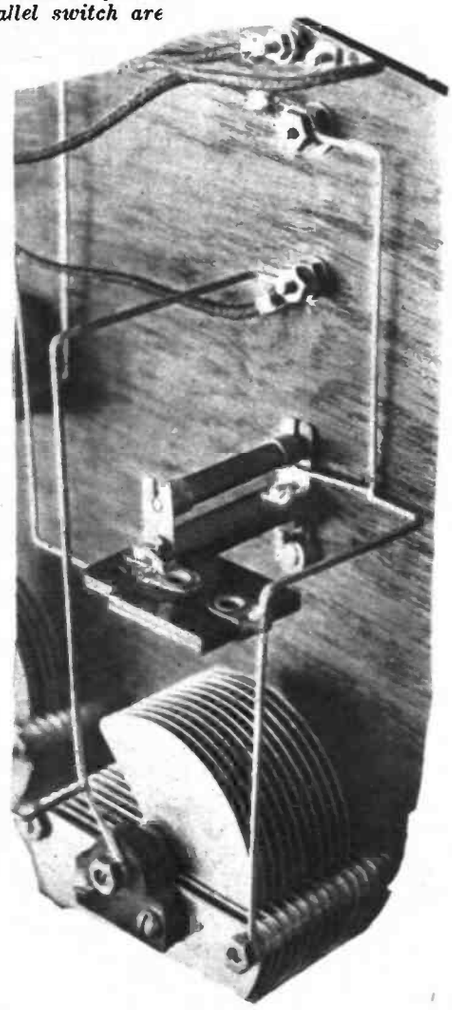
THE ADVANCED AMATEUR WILL HAVE A LOT OF FUN WITH THIS SET



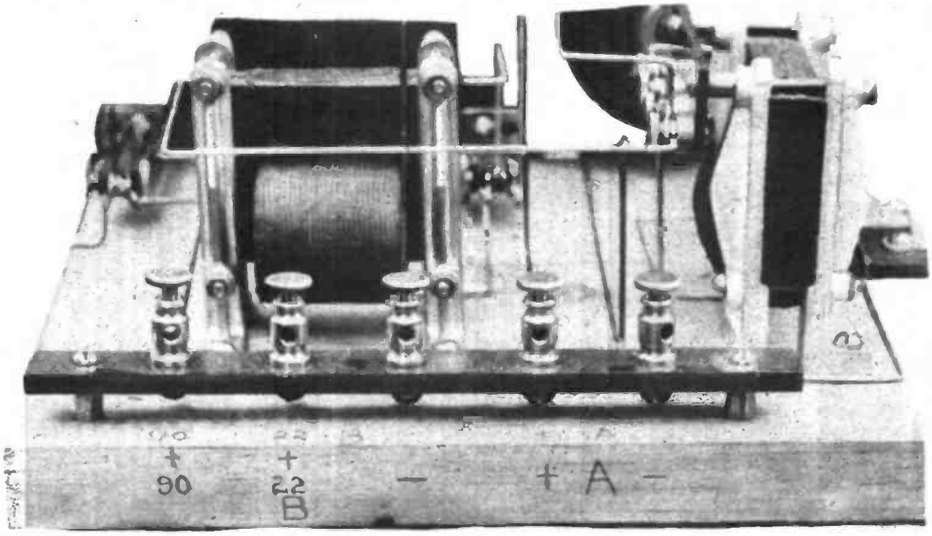


Above you will see how the eight contact points of the series-parallel switch are wired. The picture also shows how the lead wires from the honeycomb coil mount are brought over to the contact points of the Goodman coil mount in the center of the top part of the panel. The right-hand variable condenser is the 43 plate, the center is the 23 plate, with the variable grid leak and grid condenser above it, and the third variable condenser is the 9 plate tickler with the little vernier condenser above it.

To the left is a picture showing the way the bulbs are mounted on a shelf with the rheostats directly under them and the potentiometers at the base.



The picture below this shows how the battery binding posts are mounted on a strip of bakelite or hard rubber on the back of the baseboard. From left to right they are: Plus B, ninety volts; plus B, 22½ volts; minus B, plus A, and minus A.



Above is shown the method of mounting the secondary 23-plate variable condenser and above it the fixed micadon grid condenser and the Durham variable grid leak, mounted so the plunger can go through a hole in the panel and be operated from the front.

Great Falls, Md.,
May 20, 1923.

My dear Jim:

You certainly missed it being away this past week, because we went on the best hike that this Troop has ever had. Mr. Wilkins, the Scoutmaster, brought us out here, about seventeen miles from Washington, on the Potomac River, and we have been having the most wonderful time with what we call our first "Radio Hike."

Mr. Wilkins told us to leave our signal flags at home this time, because he wanted to do everything by radio. He has made us two small sending sets, each one consisting of a Ford spark coil, dry cells, a telegraph key, a spark gap made from two binding posts and two nails, and enough wire to make a twenty-foot aerial.

Skinny Barrett brought along his receiving set—you know the one he bought from that gyp concern last Christmas—and he thought he was going to do the prize receiving of the Troop, but I brought along one that Skinny laughed at when he first saw it, but, believe me, he didn't laugh after our first tests were over.

I wish you could see this little set that I have put together. You know the Gibbons hook-up that you and I monkeyed with a good deal last winter? Well, I showed the hook-up to Mr. Wilkins, and he said right away, "Oh, yes; that is really the de Forest ultra-audion circuit, and it is a mighty good one!"

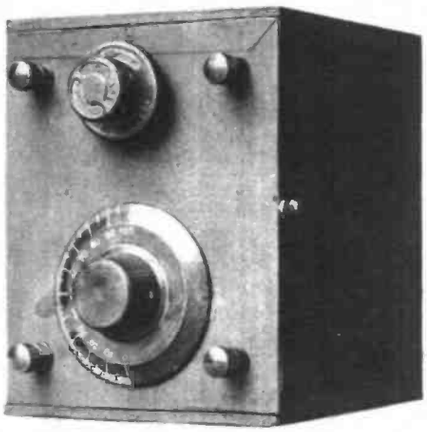
Well, I made some changes in the hook-up after you left, and, believe me, I can make it work a lot better. Then I began to figure out how to put the set in such a small space I could take it on a hike with me, and, with Mr. Wilkins' suggestion, I managed to get it down to such a small space that I put it in a cigar box and slung it by a strap over my shoulder as you would a camera.

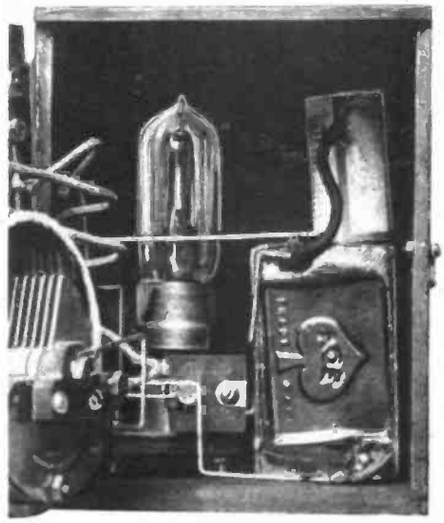
It never occurred to you and me that we could carry a complete bulb set with us on a hike, but I doped it out in such a way that it could be done. I am using a WD12 now, though the WD11 works the same way, and the A battery is just one of those little round batteries that you have for lighting those hand flashlights. You know the kind of flashlights that have the long cylinder.

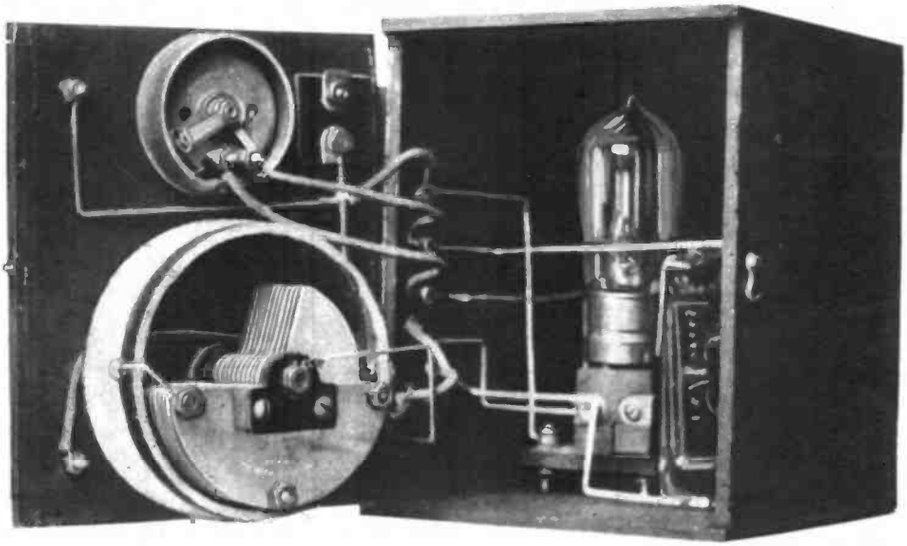
Some of these holders are big enough for two of these little batteries and others are long enough for three of them. Well, it needs just one of these batteries to burn the WD11 or the WD12 long enough to last for a hike of this kind, though, of course, it wouldn't be so satisfactory for home use because there isn't a great deal of electricity in those batteries.

Then I got the smallest size of B battery for 22½ volts, and I found that I could get both of these batteries together in the back of the cigar box with the tube and its socket in the back on the other side.

Then I mounted the rheostat and the variable condenser and the coil on the lid, and I want to tell you how I did it, so as to save space. I got the idea from a pic-

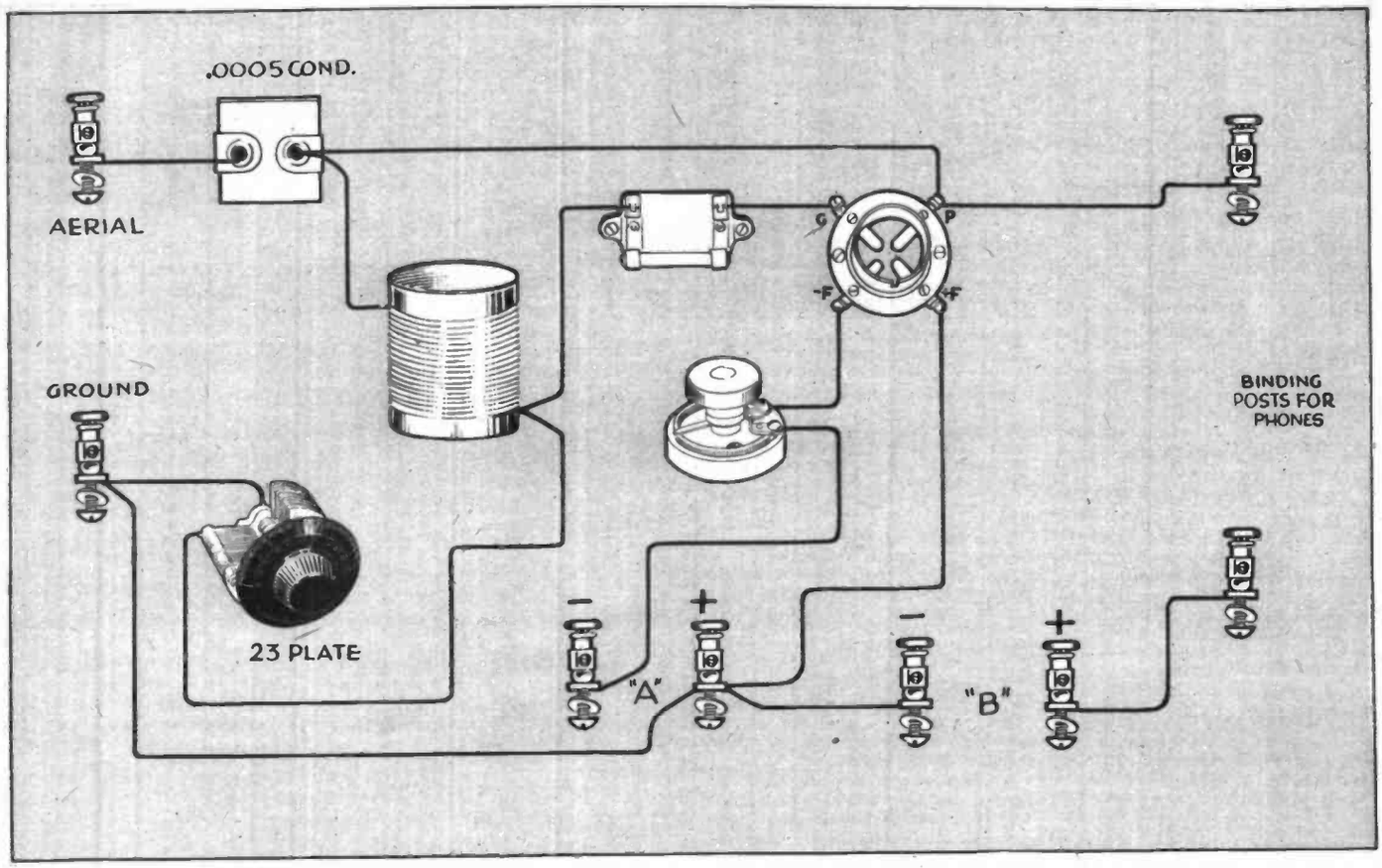






The photograph above shows the Scout hook-up in its cigar box case, closed and ready for taking on a hike. To the right is a picture with the lid open, showing how the variable condenser is mounted inside of the coil so as to save space. Above this is the rheostat and to the right is the aerial fixed condenser.

The picture on the left gives a view inside the box, and shows the tube and batteries, but this is shown more in detail in the picture above this. This shows how the small B battery goes on the base and the flashlight battery, which lights the filament of the bulb, goes above it. The drawing on the opposite page shows the details of this.



This diagram shows the hook-up of the apparatus included in the cigar box Scout radio outfit shown in picture form on the opposite page. The whole thing is easy to make and mount in this way, batteries and all.

ture in a magazine, and, believe me, it works fine.

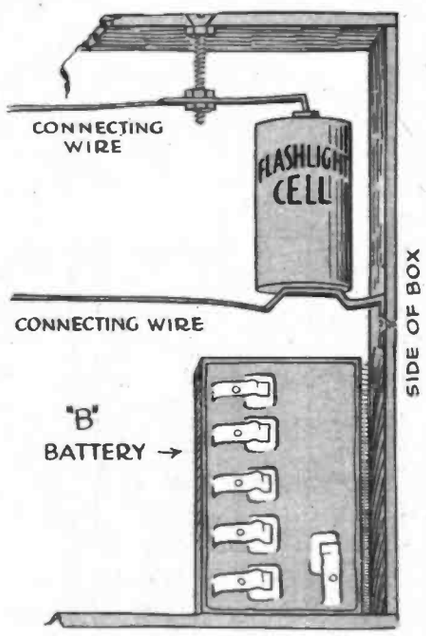
I used an oatmeal box to wind my coil on, and I made it with forty-four turns of No. 22 wire. I should have used silk-covered wire, but I didn't happen to have any, and I found that cotton-covered worked just as well. You can get the coil of forty-four turns on a piece of the oatmeal box not more than an inch and a half long, and I found that the twenty-three-plate variable condenser would fit right inside of this coil with plenty of room for the plates to turn.

So I first mounted my twenty-three-plate condenser on the lid of the cigar box and then put the coil around it and then soldered No. 14 wire for the connections between the coil and the condenser, so that the soldered wire held the coil in place. Just for safe keeping, however, I put a couple of brass screws on the inside of the coil to hold it in place. I used brass because Mr. Wilkins said that brass was not affected by magnetism and would not interfere with the tuning of the coil.

Mr. Wilkins divided us into two groups, each with a sending and receiving set, and sent one group, which I was in, out to blaze a trail and to report to headquarters all things of interest on our way, such as landmarks or rocks and trees. With this information received at camp, he and the other fellows were to try to follow us.

After about an hour's hiking over rocks and fallen trees we decided to make camp and wait for the others to catch up to us. That is where my careful preparation showed its value, because it didn't take us two minutes to rig up an aerial.

I had taken one hundred feet of bell wire and wrapped it around my waist, over my belt, and then had wrapped another piece about fifteen feet long over top of that. The one hundred feet was for the aerial and the other piece was for the ground wire.



This diagram shows the movable metal contact blade for making contact with the flashlight cell and permitting the removal of the cell.

As soon as we decided to pitch camp, I threw a long piece of string over the limb of a tree, tied it to one end of the aerial wire and pulled it up to the place where I wanted it, leaving the aerial wire at least fifteen feet away from the nearest branches and leaves of the tree.

Then I went to another tree about two hundred feet away and threw another piece of string over the highest limb that I could reach, and pulled the other end of the aerial wire up, leaving enough for a down-lead to the set.

This meant that I had my aerial strung between two trees nearly two hundred feet apart, and it meant that the aerial wire was well clear of all limbs and branches. Mr. Wilkins said that this was very important, because the branches and leaves of trees absorb a great deal of energy from a radio station, and you don't get half as much of it in your aerial if the wire is anywhere near these branches.

We had not had the aerial up more than about fifteen minutes when we heard a call from the other group, and did not have any difficulty in picking them up at all, because those Ford spark coil sending sets send out a wave so broad that you can easily find it. They are all right to use in this way, because they are so very weak they will not carry more than about a mile or two, and with the short aerials we were using they would not make a long enough wave length to interfere with anybody else who was using a radio set.

We had no trouble in getting in communication with them, and we soon found that they could see a tall white barn with a silo and a high windmill on the top of a

hill about two miles to the north of us. They told us what direction it was from them, and we told them exactly the direction it was from us and how far away, and with this they were able to locate us and soon caught up with us.

That night, Skinny Barrett and I had a contest with our two receiving sets, and he simply wasn't in it at all. He rigged up his own aerial and tuned in first and then told me what station he had, and it didn't take me long to get the same station on my aerial.

Then I tuned around and got a station about two hundred miles away, and he came over and listened to it a while on my phones and then went back to his set and tried to get it, but couldn't do it. Then I kept on tuning, and inside of half an hour I had heard six different stations on my set, and Skinny Barrett was only able to get two of these stations.

I forgot to tell you that I made some changes in my circuit since you saw it. The first one, and I think the most important, was that I put a little .0005 micadon condenser in the aerial circuit. I did this on the suggestion of Mr. Wilkins, who showed that it would make the set oscillate on any aerial, no matter whether it was a long one or a short one.

Then I changed the connections of my twenty-three plate variable condenser so that the movable plates were connected with the ground. By doing this Mr. Wilkins said that the movable plates would be grounded the same as your body is, and then when you touched them there was no body capacity. Try this on your own set and you will be surprised at the difference.

I tell you this set made Skinny Barrett feel cheap when he found out that my little home-made set brought in more stations than the manufactured one that his father gave him. You remember the one that I mean—single tube one that was made by that gyp concern that was afraid to put their name on it.

Well, some of these days people will realize that if they want good radio sets they will have to buy them from reliable manufacturers who have been in the radio business for a long time and know what they are making.

When I take my set home I am going to make one change that will improve it a whole lot. The way it is now I simply have my rheostat and condenser and coil mounted on the lid of the cigar box, and the whole box is painted over with insulating varnish; but I am going to take off the lid and put on a good piece of regular panel material there and attach it by means of two little hinges, and then I will have a set that I can be proud of.

You would be surprised how easy it is to carry this entire radio station with me. The aerial and ground wire wrapped around my waist is hardly noticeable on a hike because it is not much heavier than my regular belt. I carry the receiving set by a strap around my shoulder just the same as you would carry a kodak and I hang my telephones on my belt by means of a snap hook just over my right hip.

In this way I am a walking radio receiving station and scarcely know that I have anything extra added to my regular hiking equipment. I am sending you with this letter a diagram of the set the way I have it hooked up now, and I advise you to try it because, believe me, it is a wonderful little set and I have had stations as far away as a thousand miles with it.

The only trick in mounting it is in the flashlight cell. Mr. Wilkins showed me how to fix up the connections for it so as to be able to insert a new cell when the old one is worn out.

I put an ordinary machine screw through the top of the cigar box and fastened a piece of tin bent like a switch lever by means of two nuts on the inside of that. This switch lever can be swung over to make contact with the center connecting point that comes out of the battery; and the bottom, which is the zinc, is connected by another strip of tin fastened to the side of the cigar box.

Then when one flashlight is burned out and I want to change, I simply swing this top lever to one side, take out the cell, put another one in and swing the switch lever back again until it makes contact with the center post.

You had better wire your set up the way I have mine because it is so good. So that you won't make any mistake in doing it, I will give you a list of the wires here and you can check up on it afterward by having somebody read this list to you while you go over your wiring:

A wire from the aerial binding post to one side of your micadon condenser.

A wire from the other side of your micadon condenser to the plate binding post on the socket.

Another wire from that plate binding post on the socket to one of your telephone binding posts.

Go back to your micadon condenser and run another wire from the second side of it to the first wire of the coil.

Run a wire from the last turn of the coil to one side of your grid condenser and another wire from the other side of your grid condenser to the grid binding post on the socket.

Go back to the last turn of wire on the coil and put another wire on it leading to the stationary plates of your condenser.

Another wire from the rotating plates of the variable condenser to the ground binding post.

Another wire from the ground binding post to the switch blade or piece of tin that touches against the center of the flashlight cell. This is the top part of the A battery.

Another wire goes from that same side of the flashlight cell to the minus side of the B battery and another wire goes from the same side of the flashlight cell to the filament binding post on the socket.

A wire goes from the piece of tin which touches the bottom of the flashlight cell (or the minus side of the A battery) to one side of the rheostat and another wire from the other side of the rheostat to the minus filament connection on the bulb socket.

A wire goes from the positive side of the B battery to the other phone binding post.

Hook it up that way and you'll have a set that's a Jim-dandy.

That is all for now. We are going on another hike in the morning and I want to turn in.

Your old pal,

BILL.

P. S.—I will write you from the next place we stop.

BILL.

Editorially Speaking

(Continued from Page 15)

of another very well-known financier who has his control set in one room and who has had his whole house wired with plugs in almost every other room and a loud speaker alongside of these plugs so that, no matter where any member of the family is, the desire for entertainment can be immediately supplied by plugging into one of these places provided for that purpose.

I shall show you many such things, all designed to bear out what I say —that radio is here and here to stay and that it has emerged from the status of the toy and has become a really essential part of modern home life in the very best class of homes in America.

My object in showing these pictures is to convince you that you should do your part in the raising of radio to the high plane which it deserves to occupy.

I am still giving hook-ups because, thank Heaven, the experimental instinct is still very much alive in the American mind and I hope it will never die. It is this instinct which has made us the leaders of the world in inventive genius and in the development of new uses for every possible phase of every possible science.

I hope to be able to help you to keep track of all new circuits and all new ideas in radio providing I myself find them adaptable to the limited experience and knowledge of the average amateur.

That is my only part in this game —the translation of the technical and bewildering reports of scientists into the plain, ordinary language of the everyday man so that he himself can experiment with the various developments which he hears about.

I am not in any sense an originator; I am simply a translator. but I figure that even the translator has his value in the present stage of radio development.

I hope also that, by arousing public interest in these beautiful sets, I will be able to bring the manufacturer out of his present state of semi-stupefaction and make him realize that the kind of merchandising methods which are in force in the radio business today are hopelessly antiquated and will never bring success to him in the field which should return a very large and satisfactory profit.

Radio, in its manufacturing and merchandising aspect, has not yet attracted the business brains that it took to build up the automobile, the piano, the talking machine, and all of the many electric household appliances which are in such widespread use today.

It was astounding to me to look around the radio merchandising field and see that very few of the men who are in the business today have learned anything whatever from the experiences of the men who developed the businesses that I have mentioned.

I cannot understand the business policy which will spend many thousands of dollars in a national advertising campaign designed to create a popular demand for a radio set and yet at the same time totally neglect to establish sufficient distributing agencies to enable the public to see and test that set, once curiosity and potential buying power has been aroused.

I actually know one firm that has tied up a $56,000 contract for national advertising in a big magazine and which has yet *only five distributing agents in the whole United States.* Suppose you, in some town in the Middle West or the South or anywhere, should be attracted by this man's advertising and should want to buy the product which he is turning out. How would you go about it?

You would not find, probably, one of his agencies within reaching distance of your home. He is putting out a product which is beyond the reach of the mail-order business and one which will sell only upon personal investigation, actual sight and convincing tests.

Yet he has made no provisions to enable you to see this product, to investigate it or to test it, unless by mere accident it happens that you live within reaching distance of one of these five distributors.

I am in much closer touch with the radio merchandising field than most of you are, and yet, when I recently looked through a radio magazine which carries a great deal of advertising, I found that I did not know any place in Philadelphia or vicinity where I could see any one of 75 per cent of the well-known products advertised in that periodical.

If the automobile business had been conducted in this way it would not have reached its present wonderful status in so amazingly short a time.

If the motion-picture industry had been so conducted the movie audiences would number about half what they do now.

If the piano business had been so conducted, there would be thousands of homes still echoing to the tinny reverberations of the old square instrument.

No matter where you live, if you want to see a Cadillac or a Packard or a Ford or a Lincoln, you will have very little difficulty in finding a place near you in which those cars are displayed and in which you can make your investigations.

Every motion - picture producing company has built up a complete chain of distributing exchanges, and the owner of every motion-picture house, even though the house may be in the smallest community in the most remote section, has no difficulty in dealing with an exchange near him.

The same is true with the piano and the victrola and all of the many electrical household appliances. You know where to go to see them in case the national advertising interests you.

This situation has held back radio very decidedly during the last year. If radio has made such tremendous strides in spite of this handicap, you can imagine what is going to happen to radio when, as will be the case in the very near future, these manufacturers have turned their offices over to experienced business men, and these business men have tackled and surmounted this important matter of distributing agencies.

A year from today you will have no difficulty in finding a place where you can see and personally investigate any set or any piece of apparatus which is advertised nationally. These men are being rapidly attracted to this radio field, and I know of five great, well-established organizations which have made millions and great reputations in other fields which are going into the radio business next fall.

With these men once in the game, radio will go ahead by leaps and bounds which will make the past enthusiasm seem like a mild summer's breeze.

With business men buying beautiful sets in spite of the lack of business methods in selling them, what will the future hold when real business men take care of this business of distribution?

The field is absolutely limitless and there is no question in my mind that the events which are taking place quietly right at the present time point most unmistakably to a long and prosperous career for this newest of the arts.

One of the best moves that I have seen has been made by the Amrad people, who have put through a financing plan by which they help their dealers finance the sale of apparatus on time payments.

I have believed all through this radio craze that radio would not come to the position it deserves until some arrangement was made to sell first-class and rather expensive sets on the time-payment plan. It was this plan that made the automobile, the piano, the Victrola and the electric household appliance possible.

This plan will also make the good radio set possible, and it will have the advantage of being feasible only with manufacturing organizations whose financial standing is sufficiently good to enable them to do it.

I am also interested in the plan being developed by the Colin B. Kennedy Corp. of locating in each distributing center a specially trained factory representative. This man will be charged with the duties not only of supplying information to the prospective customer, but of following the set to the home of the purchaser and paying personal attention to seeing that the set is properly installed and that it gives continuous good service.

This is a large undertaking, but it shows what the well-established manufacturer thinks about the radio field. If he were not very certain that the industry is a permanent one and one which justifies a great deal of careful planning and forethought, he would not go to such trouble as this.

These are signs of the times, and they show that radio is at last getting on its feet, speaking from a merchandising standpoint.

A Loud Speaker on One Bulb? Sure!

(Continued From Page 9)

very fully charged. The bulb used in radio receiving consumes a great deal more current than the ordinary car or motorboat engine, and if you use a bulb on the battery very long, you may find that your car or your motorboat is stalled because it will not have enough juice to give you a good spark.

Always be sure that your battery is up to a very full charge before you attempt to use your radio set on it and even then do not use your set more than two hours at the most continuously.

The man who has a little open motorboat or canoe can make some very interesting experiments with this hook-up. It is along a line that we are investigating more fully out at Station 3XP, but I am not prepared just yet to say how it is going to work out. I do know, however, that it will give some results.

This experiment is with an underwater aerial.

Take a length of wire which is covered with a very heavy insulation of rubber—a length about 25 feet will do—dip one end of the wire into some melted beeswax or paraffin so that the bare end of the wire where it has been cut off is well covered and protected from water, and then drop this insulated end overboard, attaching the other end to the aerial binding post on the set.

Attach a bare wire for your ground to the ground binding post on the set and let the end go into the water.

Thus you have both aerial and ground in the water, and I understand that many experimenters have had some remarkable and surprising results with this combination. As I have said, I am not yet prepared to report on it as the experiments at 3XP are by no means complete.

Do You Know What "Neutrodyne" Means?

I HAVE had a number of letters commenting on the editorial in the June issue in which I speak of the mistake of many manufacturers using technical terms to designate their sets. I spoke particularly of the Hazeltine circuit, which is called the "neutrodyne."

This seems to have aroused the curiosity of many readers and they want to know what a "neutrodyne" circuit is and what neutrodyne means.

It is rather difficult to explain this without going into technicalities which would puzzle the average beginner, but I think that I can give you a general idea without getting you in too deep.

In the last issue, in one of the articles, I explained that radio frequency current will pass through condensers, whereas currents that vibrate more slowly will not pass through condensers. In other words, a condenser, instead of being an insulator in a circuit which conducts radio frequency current, is really a conductor.

Without going into the details of the matter, I will simply state that the three elements, the grid, the filament and the plate, which are inside the bulb, have a tendency to act like a condenser. This means that radio frequency current can pass right through the tube, whereas direct current or current alternating slowly will not pass through it.

In using radio frequency amplification it is necessary to prevent in some way the "feeding back" of radio frequency current to the original place where the signals have entered. If these radio frequency currents can find a condenser through which they can pass they will get back and cause a great deal of confusion by getting all mixed up with the original currents and the result will be a howl or a whistle or that peculiar groaning in the tube which shows that the tube is performing that stunt which we call "oscillation."

This constant oscillation of tubes used in radio frequency amplification is one of the most annoying drawbacks to this very desirable system of building up weak signals.

With this as a basis and with just a little explanation of what the derivation of the word neutrodyne is, I think you will understand the basis of the Hazeltine circuit.

The syllable "dyne" comes from the same word from which the word "dynamo" and the word "dynamic" come. It simply refers to power or energy.

The syllable "neutro" comes from the same word as our word "neutral" or "neutralize."

The Hazeltine circuit, then, is simply a circuit which by a very clever arrangement neutralizes this tendency of the radio frequency amplified currents to feed back through the condenser effect of the tube and cause a mushing up of the signals.

If you don't understand that, simply remember that there is, in most radio frequency circuits, a tendency to spoil the signals and that the Hazeltine neutrodyne circuit neutralizes this tendency. You needn't go any deeper into the matter than that because that is all that is necessary to understand.

If you do not understand the difference between radio frequency, audio frequency and direct current, let me take you into the kindergarten class and start with the fundamental fact that direct current is a current which flows steadily in one direction. Alternating current is a current which flows first in one direction and then in the other direction. Your house lighting current alternates at the rate of sixty cycles—back and forth—a second.

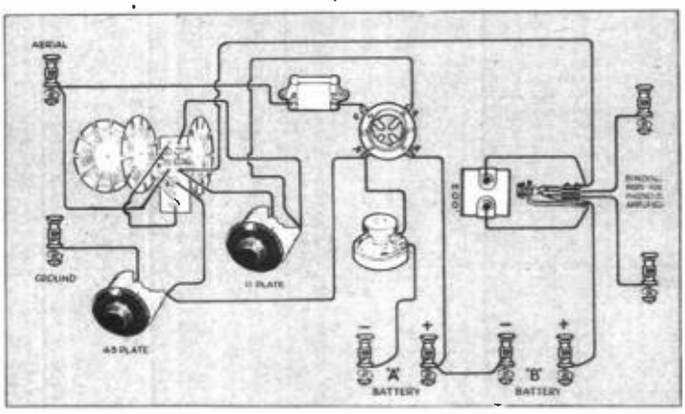
Audio frequency currents are currents that alternate at comparatively slow speed, sufficiently slow for the human ear to respond to them. That is why we call them audio or audible. The limit of audible or audio frequency alternation is somewhere around two or three thousand a second. Everything above that is radio frequency.

Radio frequency alternations are those which are, for ordinary purposes, somewhere around five thousand times per second up to three million times per second. These currents alternate or oscillate so fast that they will not work the diaphragm of a telephone nor will the diaphragm of the human ear, which we call the ear drum, respond to them.

We make this distinction though there is no very sharp line between audio and radio frequency, because some ears can hear higher frequencies than others, but for all practical purposes five thousand times per second is the limit between the two.

Radio frequency currents will do things that audio frequency currents will not do and one of these things is to pass through a condenser. The condenser would totally block audio frequency currents or direct current.

See?



The Goodman coils make an extremely sharp tuning set when used in the single circuit hook-up. In this hook-up the first and second coils are connected together so as to form what is practically a variometer instead of the usual single coil

A Crystal Hook-Up for All Broadcasting

(Continued From Page 11)

of the wire that goes to the variable condenser.

If you do not desire to use a honeycomb coil in this place, but wish to build your own, wind about twenty or thirty turns of cotton or silk-covered wire, any size between No. 28 and No. 22, around some sort of tube from 2½ to 3½ inches in diameter. The two ends of this coil then connect up in the same way in which the honeycomb coil would be connected.

If your rotor has about fifty or sixty turns of wire on it, you will probably not need this loading coil, but can hook up exactly as shown in the diagram.

With this hook-up, when the two upper blades of the series-parallel switch are over on the two left-hand contact points, the 43-plate variable condenser is in what we call parallel with the primary winding of the variocoupler, and this increases the wave length to which those windings will respond.

When you have your set adjusted in this way for the longer broadcasting wave lengths you will probably have to have your rotor coupled very closely to the primary; that is, you will have to have the windings of the rotor parallel and running in the same direction as the windings of the primary. You will also probably have to have most of the 23-plate condenser in—that is, you will find that you are reading something between 75 and 100 on the scale.

When the two upper blades of the series-parallel switch are on the two center contact points, the 43-plate condenser is in what we call series with the variocoupler and the coupler will respond to shorter wave lengths than its own normal range.

In this case you will probably set the rotor of the variocoupler more or less up and down and the 23-plate condenser will be set at the lower readings on its scale.

When the two upper blades of the series-parallel switch are to the right, as they are shown in the diagram, the 43-plate condenser is out of the circuit entirely and you are working with the variocoupler's normal wave length.

In this case you will find the rotor will probably be set about diagonally and the 23-plate condenser will be almost anywhere around the middle of its scale.

Many people who are just starting in radio have the experience that all beginners do, and that is that they are unable to tell whether the cat's whisker of their detector is on a sensitive spot on the crystal.

You must remember that all crystals are not sensitive all over. You may have a crystal which is an extremely sensitive one and a very fine detector, but it may have all of its ability stored in a few little spots no bigger than a pin point. It is up to you to find those spots with the cat's whisker or else you will not get signals.

For this purpose we use what we know as a test buzzer or a buzzer tester, and I am showing in the smaller drawing how this is hooked up.

It is simply a circuit which includes a push button, a dry cell and a little buzzer, and this circuit is connected to the ground binding post on your set.

Then, when you want to use your set and before you try to tune in for signals, you put on the head phones, press the push button with the left hand, allowing the buzzer to buzz, and with your right hand you adjust the cat's whisker, feeling around with its point all over the surface of the piece of crystal until you hear the buzzer buzzing clearly in the headphone.

You must be careful not to mistake the actual sound of the buzzer with the buzzing you get in the phones.

There is a very decided difference in the two sounds and you will be able to detect it the moment you hit a sensitive spot.

For Sharp Tuning Try Spiderwebs

(Continued From Page 22)

Usually I set my three condensers at about one-half of their value or at fifty on their scale, and then with my left hand on the primary coil and the right hand on the edge of the tickler coil, I put the three coils touching each other, then gradually and very slowly move the primary coil away from the stationary coil, at the same time more rapidly opening and shutting the tickler coil.

There comes a time when there will be a little click or whistle in the phones and I get the coils back to where that occurred and then begin carefully to move the variable condensers to see whether the sound is a "carrier wave" or a signal or merely the whistle of the tube oscillating in the set.

The advantages of the series-parallel switch are particularly great in sections where there are two stations broadcasting simultaneously on a fairly large difference in wave lengths.

For instance, the stations in Philadelphia broadcast simultaneously on 395 meters and 509 meters.

I find that, with this series-parallel switch in the parallel position, I can tune my set so as to get the 509 meter stations at maximum and then the mere throwing of the switch over to the series position brings in the 395 meter stations without further tuning.

Soldering

(Continued From Page 13)

soldering. What he has in the bottle is acid. This acid has been "cooked," as they call it.

By cooking, they mean that small pieces of zinc have been added to the acid. When this is done the acid boils very violently and eats the zinc. They keep adding zinc until the acid will not eat any more. Then they say that the acid is cooked, and the plumber or tinner will claim that the corrosive action of the acid is ended.

But don't you believe it. If the acid were really dead it would not be fit for soldering.

Never use tinner's acid for soldering around a radio set. It may be all right up on the roof or in the sink.

Acid in any condition will conduct electricity — that is to say, it will not offer sufficient resistance to a current to prevent it flowing. If you use acid in soldering your wires on a radio set, there is bound to be a certain amount run around the joint, and when you solder the next joint a little more acid runs around that one. These drips of acid may be so small that you do not notice them, but the acid is there and when you start to use your radio set you may find that you can get no signals.

Right away you will blame the bulb or the battery or your kid brother or your wife or half a dozen other different innocents. You would not think of looking for a leaky joint, but this is very probably the trouble.

And besides having leaks for the currents to run through or across, your supposedly beautiful job of soldering will turn all sorts of shades of green.

Soldering paste contains the same acid that the tinner uses, though, of course, the paste holds it in much smaller quantities. Even this small amount, however, will cause leakage, and it is for this reason that if you use paste at all you should use the very least amount which will do the job for you and should clean the paste off very carefully afterward.

Once you have learned to handle a soldering job correctly, I advocate discontinuing the use of paste entirely and using only resin as a flux. For this purpose, the wire solder with the resin core is ideal.

It is somewhat more difficult to use resin because the parts to be soldered must be extremely clean and the iron must be very hot. But when we solder a joint at 3XP we always use the resin core solder.

Sometimes you leave the iron in the flame and forget all about it while you are doing something else. Maybe you think you won't do this, but I can assure you that you will, because I find that in spite of all the time that Mr. Vollten and I have spent around radio apparatus, we still forget the iron on the fire.

The iron will become red hot and you may think that it is ruined, but it is not. You will find that the tinning has burned off and without that you cannot make the solder stick.

File off all the burnt solder and make the iron nice and bright and then tin it again before you use it.

If you wish to be particularly careful in your soldering job—and I advocate this if you are using paste—a very good rule to follow after making your soldered connections is to take an old toothbrush and some benzine and scour all the connections. This will wash away all the paste and you can then wipe carefully around each connection with a clean cloth. You will then be sure that there is nothing left to cause any trouble in the set.

And finally don't forget what I have already said — your soldering job must not be considered a good one unless you have seen the solder flow smoothly around the joints.

Troop of Boy Scouts Is 100 Per Cent Radio

EVER since the organization of Boy Scout Troop 162, of Overbrook, Philadelphia, in March, 1916, the members of the Troop have shown an exceptional interest in both wireless and radio. Under the leadership of their first Scoutmaster, Lt. Raymond T. Turn, the Troop was quick in organizing an emergency wireless system among its members.

Within a year the Troop had six licensed operators among its members with a corresponding number of sending and receiving stations. When the emergency system was at its highest point of efficiency the Troop could be assembled, without previous notification, and wholly by wireless, at its Headquarters within a half hour.

Naturally, the war did much to destroy this method of communication and at this time the Troop turned its attention to more warlike activities. Its Scoutmaster, Mr. Turn, entered the service and was subsequently killed in action in the Argonne offensive. Subsequently, the Troop adopted the name of the Turn Memorial Troop 162, of Philadelphia.

During the war the Troop did exceptional service in locating various illegal wireless stations operating against the law and in one instance reported the location of one of these stations with the result that the property was closed by the Government and a letter of commendation sent the Scoutmaster by the Naval authorities to whom the location of the station was reported.

Subsequent to the war and under the direction of its present Scoutmaster, Alexander B. Garwood, the Troop has transferred its wireless interest to radio; no less than twenty-four sets now being owned by the members of the Troop. Early this year the Troop built a portable, two tube, single circuit set accompanied by a Timmons Talker to take with them on their hikes.

The photographs on Page 2 show this set being erected and in use by the Troop at its camp in the Morris Woods near Overbrook. At the time the pictures were taken several rabid baseball fans among the members were busy listening in on the result of a game played by Connie Mack's Athletics at Shibe Park, over twenty-five miles away.

Radio Drama—Is It The New Art Form?

(Continued From Page 5)

should be given to "effects" such as door slams, glass crashes, shots, etc. The operators at our station, I know, have spent a great deal of time in finding the correct way to reproduce revolver shots.

A broadcasting station such as we maintain is especially constructed with thick, sound-proof walls. Not only are there fire and insurance regulations to be considered in using actual revolver shots, but they seem in this confined space to "blast" the microphone in such a way as to be less sharp than other sounds.

These effects, however, when properly worked out, are of tremendous value in both explaining action and arousing dramatic action.

I am myself very surprised at the response and appreciation we received after broadcasting plays by Alfred Sutro, whose work has a distinct literary value.

Percival Wilde's plays are in no way cheap and they have been very well received. I think as far as the actual story goes the essence of the thing required is much the same for radio as for legitimate, screen or for short stories.

That Grimes Circuit

EVERYBODY makes mistakes, and I suppose that I might as well admit that I make more than the usual number. I made one in the diagram that was given on page 19 of the June issue of *Radio in the Home*. It is not a vital mistake because the hook-up—which was the Grimes circuit—will work wired up as shown in that diagram, but as given there it would mean that the first bulb would be burning all the time and there would be no way of turning it down.

If you will turn to page 19 of that issue and look at the first socket in the upper left-hand corner you will see that the minus filament binding post of that socket is wired down to one of the binding posts on the first rheostat which has three wires hooked to it.

That first wire from the minus filament connection of the first socket should go to the other binding post on the rheostat.

I have had many readers write me asking if this circuit can be used with an outdoor aerial. It can be so used and it is extremely efficient.

To operate it in this way you will need a variocoupler. You connect the aerial and the ground to the primary of the variocoupler in the usual way.

Then the rotor of the variocoupler simply takes the place of the loop aerial shown in the diagram.

It can also be used with a Ducon plug which goes into an electric light socket and uses the electric wiring of your house for the aerial.

I have also had a number of questions calling my attention to the fact that we showed a combination potentiometer and rheostat in our list of parts to be bought and then in the diagram we showed three rheostats.

I gave the potentiometer-rheostat in the list for the benefit of those who know enough about radio to figure out for themselves the hook-up, and this is such a simple matter that I did not anticipate that any one would be confused by it. However, those who are building the Grimes circuit according to the diagram should use the three rheostats given there and then there will be no confusion.

Many readers say that they are unable to get this Grimes circuit to work and ask doubtingly whether we did have success with it.

All I can say is to repeat what we said in last month's article; we hooked the set up both in the table-mounted form and in the box, and I can add that in neither case did we have to change a single wire.

Those who are attempting this set cannot take any liberties with the wiring or with the makes of transformers. Ninety per cent of the success of this set will probably depend on the radio frequency transformers used, and those that we named in that article gave us results and ought to give you results if you follow the circuit as outlined there, if you check up with extreme care, paying particular attention to the spacing of the wires, to making your leads as short as possible, especially to grid and plate, and seeing that no two wires run close together or parallel.

This circuit positively does work if it is wired up according to direction; and if you cannot make it work it is virtually useless to write and ask me why, because I cannot see your set and cannot tell what you have done that is wrong.

The only thing that you can do is to go over every bit of it carefully, checking up with the utmost patience as you go along and seeing that your wires are spaced apart.

I want to caution you also against taking any liberties with the size of fixed condensers outlined in that drawing.

We ourselves thought we knew more about the circuit than the man who devised it and we did not go to the bother of getting exactly the size condensers that he recommended, but put in those that we happened to have handy at the shop.

Then we put the phones on our heads, turned on the bulbs and jumped. It sounded about like the Baldwin Locomotive Works would when the men were trying to rush a job to get through before the whistle blew.

These condensers must be mica ones and not paper ones, and they must be exactly the capacities marked on the diagram or else you will not get results with this set.

Let me give you another word of warning and that is applicable to hooking up all sets and not only this one.

Do not cover your wire with the cheap spaghetti which you can buy in cut price stores and which is supposed to protect and insulate your wires. It does nothing of the kind.

After the publication of our hook-up last month, one of my friends, Mr. H. Weston Taylor, of Philadelphia, phoned me that he had made the hook-up and could not get it to work and he seemed rather skeptical about the whole thing. I asked him to bring his set out to 3XP and he did it.

We found in the first place that his wiring was entirely too close together to work in a reflex circuit. It would have been all right for the ordinary circuit, but reflex circuits are extremely delicate pieces of apparatus and you positively must keep your wires apart and not let them come anywhere near touching at any place.

We found that his spaghetti-covered wires were touching and, in disconnecting the B battery, we were surprised to find a spark when the filament of the tubes was not turned on.

We became suspicious of his spaghetti and made a test of it. We hooked it up over a wire in a circuit with a 45-volt B battery and put it against the binding post of a micro-ammeter—and if you don't know what that is I will simply say that it is a very delicate instrument for measuring electrical current.

We found that so much current passed through the spaghetti tubing to the micro-ammeter that it would have burned the instrument out if we had not taken it away immediately.

We then became suspicious of all spaghetti and bought several specimens in the cut-price stores of Philadelphia, and every single specimen worked in the same way. In other words, this spaghetti is not an insulator at all and will positively destroy the usefulness of your set if you have two wires covered with it touching each other.

We found, however, that the genuine cambric spaghetti was a perfect insulator.

Rather than take any chances with this spaghetti tubing, I advise you to use straight bell wire or else a good wire covered with rubber insulation, but the best way of all is to use bare wire or bus wire, and bend it in such a way that at no place will any two wires come within a half inch of each other. We found that Mr. Taylor, in spite of his assurances that he had religiously followed our hook-up, had made wrong connections with two of his wires. This is so typical an incident that we told him we were going to punish him by publishing the fact in the next issue of *Radio in the Home*, and here it is.

But Mr. Taylor is not alone in this. I have found to my very great sorrow during the past year or more that fans who claim that they have followed my hook-ups absolutely and checked up every wire have really done nothing of the kind, but have made mistakes which have, of course, prevented them from getting signals.

Mr. Taylor's experience was so typical of what the average beginner's will be that I think it will be just as well to relate it in more detail.

When he went to buy his apparatus for this circuit he found that he could not get a 400-ohm potentiometer, so he bought one of 200 ohms on the assurance of the salesman that it would be all right. We found that it was impossible on nearby stations to eliminate the howling and whistling with the 200-ohm potentiometer. We hooked up a 400-ohm one in its place and found that that worked all right.

Mr. Taylor was also unable to get Dubilier micadon condensers in one store and so he accepted the salesmen's word for it that another well-advertised make was perfectly all right. We took these condensers from his set and put them on our "capacity meter." All four of these condensers were marked .001 mfd.

We found by actual test that one of these was .00068, another .0008, the third .00078 and the fourth .0008.

I do not ordinarily believe in recommending my readers to buy any particular make of instruments and in the ordinary circuit the differences between these capacities and the capacity stamped on the condenser would probably not count for very much.

But this Grimes inverse reflex is so extremely delicate and so altogether dependent upon an exact balancing of the circuits that the capacity of the condensers is of the utmost importance. I, therefore, suggest that our own experience in finding the Dubilier condensers virtually exactly what they are marked is sufficient reason for me to suggest that only they be used in this particular circuit.

Another thing that Mr. Taylor did was to take an ordinary rheostat for his detector tube in place of the vernier rheostat which was recommended in our article. He could not get the vernier one and did not think that it would make so much difference.

This rheostat is extremely important. The vernier may make all the difference between howling and whistling on the one hand and perfect reception on the other on certain signals.

We found the best results with the Marco, the Bradleystat or the Filkostat. Another thing that Mr. Taylor overlooked was our calling for a vernier variable condenser. The ordinary 23-plate condenser will give you fair tuning, but the adjustment of the condenser is extremely critical sometimes, and I very strongly advise you to put a three-plate vernier condenser in parallel with the 23 or else get a regular 23-plate condenser with the vernier blades on the separate knob.

To test the hook-up as it was printed in last month's issue, we took Mr. Taylor's set apart and reassembled it according to the directions we printed in the June issue.

It worked then.

In connection with this, I am glad to print here a letter which came in last week. It follows:

Dear Mr. Neely:

Very glad to see you speak so well of the Grimes circuit in the current issue of *Radio in the Home* because this circuit has been a pet of mine since the 12th of February, when I built one in an officer's kit box, 13½ x8½x9¾.

I have built practically every circuit of any consequence except the super-heterodyne and for general all-around satisfaction this inverse duplex is the peer of them all. On a large loop and using 201 and 200 tubes I generally get all the larger stations on the loud speaker and most of them so they can be heard at considerable distance from the Magnavox.

For a month I have been using the set in my touring car, first with a wet battery and then with dry cells, and the De Forest DV6A, which tubes, by the way, give a wonderful tonal quality to music in this circuit, and, lastly, with the 200 and 201 tubes and the wires plugged into the dash lamp socket of my car so as to use the car battery.

In summertime the average motorist has a surplus of battery juice available, and this is a good way to use it. It is necessary, of course, to find out the polarity of the wires and I did this with a small voltmeter. I use a loop in the car, 20 inches square with 23 turns of No. 18 bell wire, spaced ¼ inch apart, and put it inconspicuously on the floor of the car.

One thing that you failed to emphasize in your article is the ease of operation of this set. It should appeal to women because there is really only one control and the same stations always come within a fraction of a space on the dial. You can almost tell any one to go to the set, point the loop toward Schenectady and turn the dial to 64 and find out what they are playing.

Another thing I like about your description is that you mention the apparatus used. So many writers in trade periodicals are afraid to do this.

I use Rasla 6 and 6A radio transformers and low-ratio Thordarson audio and use three Cutler-Hammer rheostats and, most important of all, use a Malone Lemmon .0005 condenser with vernier.

Seeing the success I have had with my set several friends have built them, but not quite equal in results to mine, and I think mainly because of the vernier condensers. I think a descriptive article in your magazine telling how to use the dash lamp to light the filaments of the set would be greatly appreciated by many fans, who I am sure are ignorant of the fact that this can be done.

Your June issue of *Radio in the Home* is certainly a dandy one to help the beginner and is not so worse for the rest of us.

Yours very truly,
W. A. LOW.
5525 Centre Ave., Pittsburgh, Pa.

I will only add one suggestion to Mr. Low's letter. If you don't know how to tell which wire from your car battery is plus and which minus, dissolve a spoonful of salt in half a glass of water, immerse the ends of the wires an inch or so apart in the salt water and watch them. Little air bubbles will soon collect all around one wire. That is the negative wire.

The radio tea-wagon is a feature of the modern summertime outdoors.

Photo made at Annual Flower Mart in Rittenhouse Square, Philadelphia; courtesy of the Estey Company.

Summertime Is Radio Time

(Continued from Page 19)

tender good-night kiss was so bear-like and so grateful that Mother almost broke down and confessed. But she held on, honoring his dignity—and Willie hasn't slid down the banisters since!

This has happened in various forms so many times that there cannot be any doubt about the efficacy of these bedtime stories and clubby little talks with the youngsters as a means of reorganizing the old-fashioned virtue of obedience.

They are reinstating childhood, making children really young again, unsophisticated, actually impressed by something they cannot entirely understand. They teach by the tried and true method of telling stories, and they go back to first principles in recommending homely virtues with little of the modern dash and pep, which is so likely to be misused, but much of the old-time unselfishness and thought for others.

The coming generation is going to have a good foundation on which to build a strong character, even if its mother is too busy playing politics and its father is too busy playing golf to take it in hand themselves.

But we were talking about how our radio set is going to help us bear the hot weather, weren't we, before we began moralizing?

So far we haven't even mentioned those whom it will probably help more than any one else. That is the people who live in regular city houses—those rows and rows of dark stone or brick houses, with a common wall on both sides, and no way for air to get in except in front and back. No porch, no ground in front of the house. Just a "stoop," consisting of three or four steps and a small landing outside the front door.

In localities that are not "proud" the family usually gathers about these steps of a summer evening, striving to catch a breath of air that will be cooling. The evening drags itself out, hot, dry, utterly still. At half past nine the general exodus toward drug store or ice cream parlor begins, and keeps up until almost midnight.

What a help it will be to families like that to have their radio set placed near the front window, or, if it is easily moved, brought out into the doorway. The heat is much more bearable if the mind is busy thinking about something else, and this solves that problem without involving any moving about or exercising, which so often defeats its purpose under these circumstances.

Nine o'clock will come much more quickly and easily to some one who has been listening to some soprano sing a lovely trilling solo about cooling streams and wavering shadows; talks on various summer sports will draw the imagination away from the ugliness and sameness of the view; and acts from a popular show or some vaudeville house will make a city family forget how hot they are.

Another problem of warm summer evenings will be neatly solved by the radio set. It has always annoyed and worried Sister to have to entertain callers—this is a Wednesday and Saturday night problem—right in the midst of the family.

Not that Sister is one of those girls who will bear watching, but it is embarrassing to have to make general conversation or else have your private conversation listened to because the family can't think of anything to say at the moment. And yet it doesn't seem right to Sister to ask the family to stay inside on those evenings or let her stay inside with "him."

Radio simplifies everything. Now, when Grandma, the Demon Chaperon, seems to be taking too great an interest in the call, or too much of a part in the conversation, or when the Kid Brother Pest begins to show off for the caller, Sister can clap earphones on the two of them and continue entertaining her caller with a clear field and conscience.

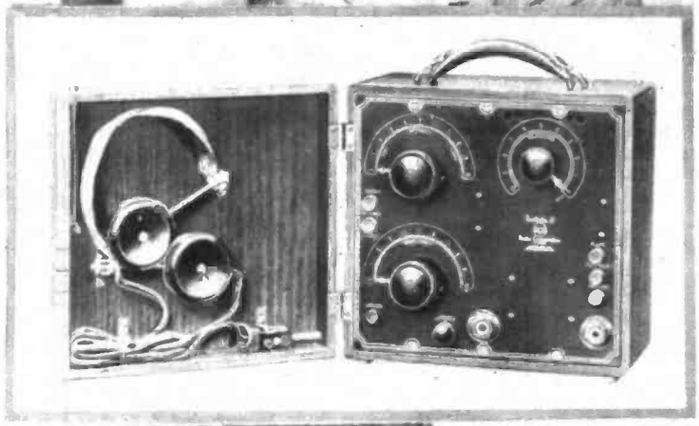
She has also a little assistant entertainer for the caller who hasn't learned the graceful art of leaving at a decent hour, or the caller whose conversation is tiring and uninteresting. Slapping a beautiful concert on their ears, she can go on with her own thoughts, or even doze off a little without being rude. Indeed, it will be only graciously polite of her.

On the other hand, if the caller is pretty special, but very shy, it may be very convenient to have only one headpiece and a great desire to listen in. The wires don't let you go very far apart when there are two of you listening with one headpiece, you know.

It really doesn't matter so much what the season is, there will always be enjoyment and entertainment to be derived from your radio. But during the next few months it will be a help, and a blessing as well; in a number of ways it will make your summer housework easier, keep you in a better frame of mind despite the heat, and help you to forget that you can't afford to go away to the seashore or mountain to escape hot weather.

If you're away in spirit and desire, and the voice of some one who is away sounds in your ears, you will find the summer as pleasant and livable as winter.

Troop No. 1 gets the scores at Camp Schnarr, Ossining, N. Y.



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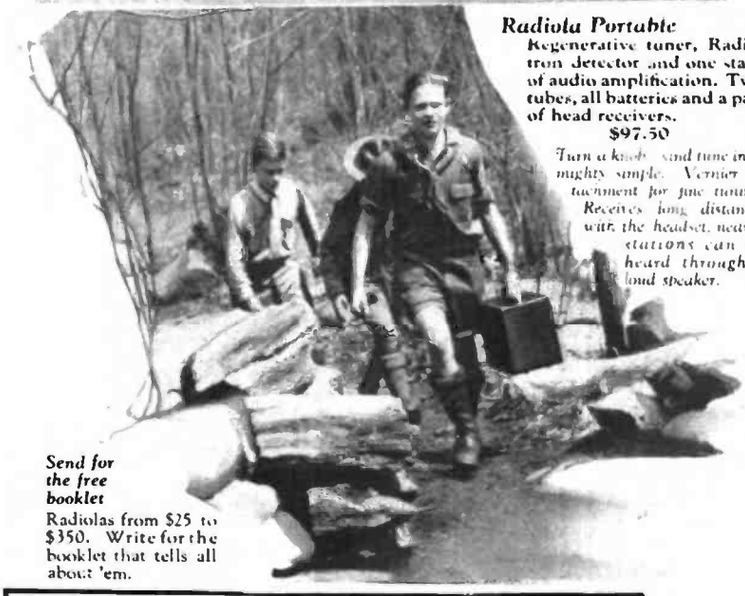

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