

February, 1926

RADIO IN THE HOME

10¢

Conducted by HENRY M. NEELY



In this issue:
The Ultimate DX Set
The "Diamond of the Air"
Taking the Bother Out of Batteries >>>



The Radio Home

is a prosperous home. It can afford to buy anything that makes for the comfort, convenience or culture of the family. It has proved, by a considerable CASH investment in Radio, that it is a modern home and in the market for all that is up to date.

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May We Introduce You?

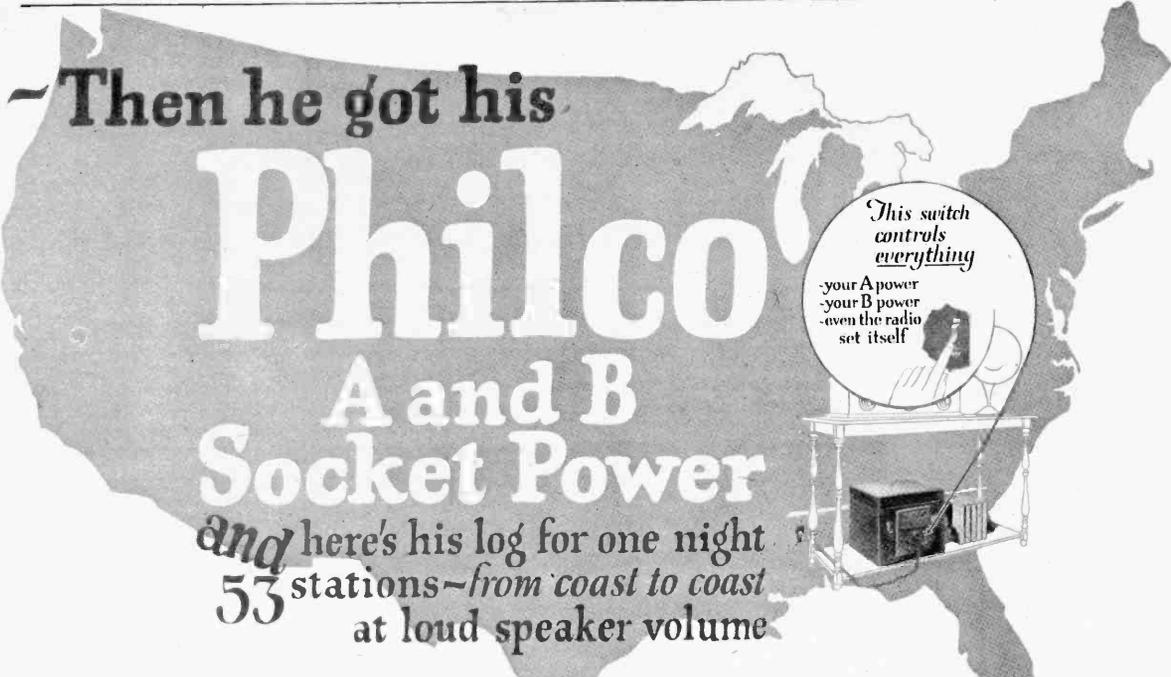
RADIO IN THE HOME

Public Ledger Building

Philadelphia

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Philco "A" and "B" Socket Powers eliminate "B" batteries and all thought about "A" battery recharging. They change your bumpy alternating house current into the smooth, HUM-FREE power necessary for your radio.

Plugged permanently into a lamp or wall socket—snapped "ON" and "OFF" like an electric light.

Philco Socket Power "B" gives FULL-WAVE rectification—therefore HUM-FREE, undistorted reproduction. Has no tubes to burn out—no acid to corrode—no water to add—no high-voltage transformers. Costs only 1/2¢ a day to operate and can be used on any set.

- For 50-60 cycle 105-125 volt alternating current type \$47.50
- For 25-40 cycle 105-125 volt alternating current type \$52.50

Philco Socket Power "A" is a complete "A" power unit for 6-volt tube sets. It supplies "A" battery current automatically—without any thought about recharging.

- For either 50-60 cycle or 25-40 cycle 105-125 volt alternating current type \$42.50

Either Socket Power "B" or Socket Power "A" may be used alone, but when used together, one switch controls everything—"A" power, "B" power, even the radio set itself. Snap it "ON" and enjoy your radio. Snap it "OFF" and go to bed.

Philco Socket Power "AB", for 3-volt dry cell tube sets, such as Radiola Super-Heterodyne, has both "A" and "B" power built into one attractive case. Also controlled by only one switch.

- For 50-60 cycle 105-125 volt alternating current type \$65.00
- For 25-40 cycle 105-125 volt alternating current type \$68.50

(Prices complete—no rectifying tubes to buy)

Philadelphia Storage Battery Company
Philadelphia

"The following log of stations was received by me during the evening of November 18, 1925, on a Radiola Super-Heterodyne Set, 1924 model, equipped with Philco Socket Power "AB". Every section of the country was at loud speaker volume. I credit this fine reception to my Philco Socket Power "AB". Nothing compares with the wonderful way it puts the programs across."

(Signed) J. W. Griffin, Cedar Rapids, Iowa.

Time	Call	City	State	Program	Time	Call	City	State	Program
8:58	WQAW	Omaha	Neb.	Story Lady—Miss McLaughlin	8:46	KOA	Denver	Col.	Story Man
9:00	WRIQ	Lansing	Mich.	Dinner Music—Sizing Off	8:48	WEAD	Columbus	Ohio	Ladies Orchestra
9:04	WQIC	Davenport	Iowa	Chimes	8:50	KFBI	Columbia	Mo.	"Laughing Waters"—Piano
9:30	WIRQ	Des Moines	Iowa	Music	8:50	WICQ	Mpls.-St. Paul	Minn.	Farm Talk—Inez Tomabaders
9:32	KYW	Chicago	Ill.	Uncle Bob	9:15	WLIB	Chicago	Ill.	Orchestra—"Indiana Bound"
9:38	KOH	Council Bluffs	Iowa	Orchestra—Announcing "Silent after 7 p.m."	9:17	KFEJ	Oklahoma City	Okla.	Program from Municipal Auditorium
9:40	WSAI	Cincinnati	Ohio	Orchestra—"Pal of My Cradle Days"	9:20	WHDH	Minneapolis	Minn.	Orchestra—"Oh Boy! What a Girl!"
9:43	WJG	Detroit	Mich.	Orchestra	9:30	WHI	Ames	Iowa	Weather Report
9:57	WDDO	Chattanooga	Tenn.	"Stand by until 7 p.m."	9:30	KMA	Shenandoah	Iowa	Songs by Mr. Cunningham
9:59	WENR	Chicago	Ill.	"Sizing off until 8 p.m."	9:43	WEDH	Chicago	Ill.	Songs
7:01	KUNF	Shenandoah	Iowa	Piano Solo	9:45	WDAP	K. C.	Mo.	Orchestra—"Peaceful Valley"
7:05	WTAM	Cleveland	Ohio	"Organ"—Stars and Stripes	9:53	WJTS	Jefferson City	Mo.	Musical Program
7:15	WFLW	Cincinnati	Ohio	Orchestra—Classical Program	9:56	WHIT	Chicago	Ill.	"Organ"—Songs My Mother Used to Sing
7:18	WQJ	Chicago	Ill.	Songs	10:13	KLZ	Denver	Colo.	Rainbow Lane Orchestra from Shirley-Savoy
7:24	WCX	Detroit	Mich.	Songs from Robin Hood	10:15	WMBH	N. O.	La.	Cottonpicker Twins—"Dixie"
7:27	WEAF	New York	N. Y.	Hot Ban Buddies	10:27	WSM	Nashville	Tenn.	Song—"Same Old, Dear Old Place"
7:30	KSD	St. Louis	Mo.	Song—"Because You're Irish"	10:47	KHIS	Hot Springs	Ark.	Orchestra—"Silver Head"
7:30	WHAS	Louisville	Ky.	Orchestra—"Brown Eyes, Why are You Blue?"	10:51	CNRW	Winnipeg	Man.	"Let us Waltz as we say Goodbye"—Sunt
7:45	KYVO	Bridgton	Ohio	Orchestra—"Pal of My Cradle Days"	11:00	WSH	Atlanta	Ga.	Orchestra—"Charleston Back to Charleston"
7:51	WHDH	K. C.	Mo.	Songs	11:24	WJR	Pontiac	Mich.	Song—"Sleepy Time Gal"
7:53	WLS	Chicago	Ill.	Travis—"Stand by for program from radio show"	11:27	WHBF	Miami Beach	Fla.	Orchestra—"Smile the White"
7:57	WSEI	Iowa City	Iowa	Lecture	11:50	WUCN	Chicago	Ill.	Song—"You Got to Know How"
7:58	WBAP	Ft. Worth	Texas	Orchestra	11:53	KDRG	Houston	Texas	Colored Church Singers
8:03	KDKA	Pittsburgh	Penna.	Music and Songs	11:58	KPS	San Francisco	Cal.	Silverstone Coral Singers Off
8:20	KFI	Los Angeles	Cal.	Special Road and Auto Trail	4:30				
8:20	KFAB	Lansing	Neb.	Talk on Farm Club Work	12:55	WEAII	Wichita	Kans.	Song—"Memory Lane"
8:32	WBZ	Springfield	Mass.	Piano Solo from Brunswick Studio, Boston	1:23	KHJ	Los Angeles	Cal.	Orchestra—"Five Foot Two—Eyes of Blue"

Sold and demonstrated by leading radio and music stores and by Philco Diamond Grid Battery dealers.

Philco also builds rechargeable batteries, unique because they may be permanently connected to your radio and safely charged in your living room without changing any wires. Easier than the periodical renewing and rewiring of dry cells.

Philco Standard "B" Battery—a complete Adam-brown mahogany finish replacement for 90 volts of dry cells. Only \$19.85!

Philco's "A" Batteries in acid-tight glass cases for dry-cell tubes, \$8; 6-volt tubes, \$16. Built-in charge indicators.

In rubber cases, subdued mahogany color, \$14.85 and up.

Philco Radio Batteries are built DYNAMIC—DRY but CHARGED. Their life doesn't start until the dealer pours in the electrolyte. You can't get a stale Dynamic Philco.

Buy a Philco Diamond Grid Battery for your automobile

EDITORIALLY SPEAKING

High-Power Station WJZ Makes Good—By Henry M. Neely

SOMETIMES it is most amusing and illuminating to look back in memory at the public's reaction to some scientist's proposition to try something new. Almost invariably there is immediate public opposition.

These thoughts are caused by finding among a pile of old papers in our laboratory a typewritten proclamation sent out widely by mail some two years ago. It was at that time that the Radio Corporation of America let it be known that there were plans being considered to erect a broadcasting station to use 50,000 watts of power, and to be erected at Bound Brook, N. J. I remember very distinctly the evening on which this paper was put in my hands. It was at the Radio Show in New York in 1924. A gentleman came in to our booth and asked for me, and, when he had introduced himself, told me that he represented the "Citizens' Radio Committee" of the Metropolitan District. He demanded to know what I, as an editor, proposed to do to prevent the Radio Corporation of America from establishing this giant of the air which was going to prove a radio Moloch and swallow up all the nice little radio babies in its fiery maw. I told him that I proposed to support the plan just as much as I possibly could.

This evidently did not strike the gentleman favorably. He told me, in return, that he and his Citizens' Radio Committee—whatever that was—proposed to carry their fight to Congress, and to demand legislation preventing the erection of this terrible menace. He asked me what I thought the result of their action would be.

"The result," I said, weighing my words carefully, "the result will be, I think, to make a very public display of a most

tragic state of total ignorance on your part."

The paper which he left with me was as follows:

CITIZENS' RADIO COMMITTEE,
1449 LEXINGTON AVENUE,
NEW YORK CITY

A petition to oppose the erection and operation of "super" power radio broadcasting stations:

WHEREAS, The establishment of "super" power broadcasting stations means the gradual elimination of smaller stations who are not financially or experimentally equipped to combat organized industry;

WHEREAS, The establishment of "super" power broadcasting stations is a vicious and a direct dangerous attempt to complete monopolistic aims and control the air, and to force propaganda, the least desirable character of information, upon the public;

WHEREAS, The majority of listeners-in are opposed to "super" power, even as an experiment, as previous experiments have shown its undesirability. It has caused unbearable interference, diminished the selectiveness of receiving sets, and its real purpose is not in accord with the best interests of the public;

WHEREAS, Prompt and vigilant action and governmental condemnation is asked of any and all attempts to foist this monopolistic measure upon the public on the grounds that the Nation's representative radio engineers and craftsmen condemned its purpose at the radio conference held in the city of Washington;

WHEREAS, I, as an owner of a radio receiving set, place myself on record as being unalterably opposed to "super" power.

Citizens' Radio Committee.

Joel J. Michaels,

Executive Chairman,
Metropolitan District.

As I write this editorial, Station WJZ has been on the air more than one month. I am wondering what Mr. Michaels thinks now of this horrible menace to our entire civilization.

I am wondering what the members of the Citizens' Radio Committee—if any—think ought to be done about it now.

I know quite well what I should like to do. I should like to have every owner of a radio set within the radius of WJZ

(Continued on Page 27)

WHY YOUR LETTER HAS NOT BEEN ANSWERED



Once again our laboratory must offer its apologies for having seemed to neglect a great many of our readers who have written to us. This photograph shows G. P. Allen, the head of our laboratory staff, trying to dig through the accumulation of mail which has already got so far ahead of us. We are doing the best that we humanly can, but you can easily understand that with a pile of letters like this still unanswered, the only thing we can do is to make this wholesale apology and promise to get to your letter just as soon as possible.

To the Secretary of Commerce:

WHEREAS, The erection and operation of "super" power broadcasting stations will menace radio reception and cause unlimited interference and difficulty in proper reception by the blanketing of various areas with increased power, thereby destroying the efficiency of local broadcasters;

RADIO IN THE HOME

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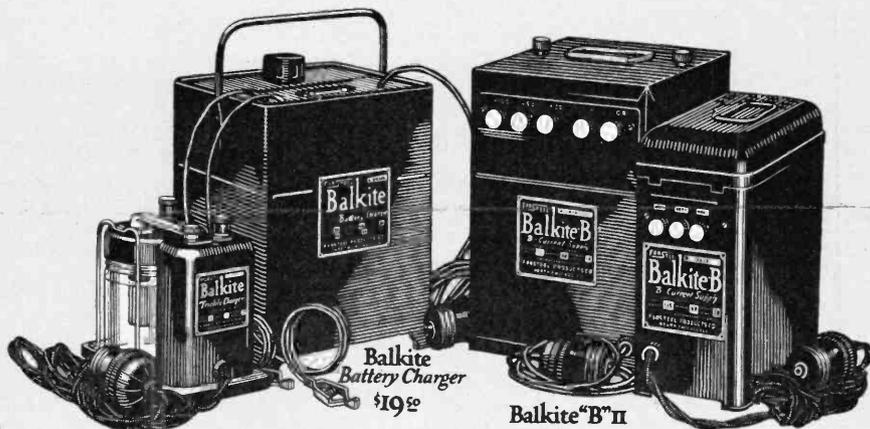
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FANSTEEL
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\$10

Balkite Battery Charger
\$19.50

Balkite "B" II
\$55

Balkite "B"
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The Eveready Hour

LIKE the fabled ship in which Jason brought home the enchanted fleece of gold, the Eveready Hour brings a rich treasure of entertainment to charm the harbor-homes of its hearers.

Inaugurated two years ago, the Eveready Hour was an adventure in broadcasting—an hour of connected entertainment, uninterrupted by the frequent injection of the name of the broadcaster.

Many of these programs have become famous. Thousands of letters voice the appreciation of our audience and ask for repetition of favorites. We make no requests for these letters, but they mean much to our artists and to us, and are of great value in helping us in our efforts to arrange

programs of a distinctive nature and pleasing to the vast audience.

Radio has already become a highly specialized art worthy of the most scrupulous code of ethics, and the Eveready Hour represents a sincere effort to pioneer in

providing the most acceptable form of radio entertainment.

Eveready programs cover a wide range of entertainment and human interest, transporting us to periods of wholesome simplicity; to barren islands where marooned sailors meet adventure, starvation and death; to battle-scarred France with singing doughboys; to emotional heights by telling with music the stories of the seasons; and to memories of yesteryear aroused by old ballad and musical comedy favorites.

Eveready Hour begins at 9 p. m. each Tuesday night, Eastern Standard Time.

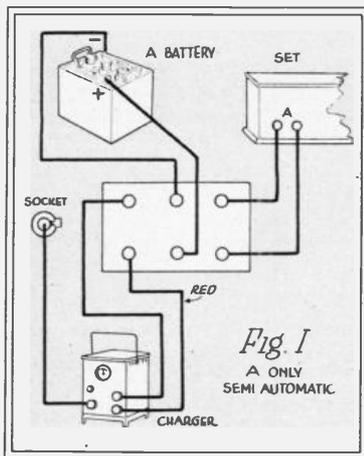
NATIONAL CARBON CO., Inc.
New York San Francisco
Canadian National Carbon Co., Limited, Toronto, Ontario

Tuesday night means Eveready Hour—
9 p. m., Eastern Standard Time, through
the following stations:

WEAF—New York	WGB—Buffalo	WCAB—Pittsburgh
WJAR—Providence	WSM—Cincinnati	WOC—Des Moines
WREI—Boston	WWJ—Detroit	WCCO—Minneapolis
WTAG—Worcester	WEAB—Cleveland	WCCO—St. Paul
WFI—Philadelphia	WGN—Chicago	KSD—St. Louis

EVEREADY
Radio Batteries
—they last longer

TAKING *the* BOTHER OUT OF BATTERIES



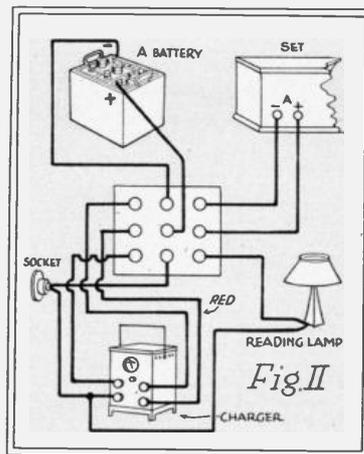
Every Radio Outfit Should Be Installed So That the Throw of a Switch Turns It On or Off or Puts the Charger to Work

By Henry M. Neely

come, they might as well give up hopes of the huge business that the spread of radio held in store for them. So, being wise men and probably being married, they realized the utter futility of attempting to change a woman's viewpoint, so they changed their batteries instead.

Today we have on the market batteries which are almost as attractive to the eye as the radio set itself. We have "anti-splash" caps that make it impossible for the acid to spill on the rugs even when the battery is tipped over to an alarming degree. We have glass battery cases that let us see the whole inside works so that we can always know that there is solution enough in the battery to cover the plates and, in a tiny compartment, we can see two little balls—one red and the other white—and these indicate the state of charge or discharge. We charge this battery until both balls float and then we know it is O. K. We use it until the red ball begins to sink and then we know that is a danger signal and the battery needs charging again. We don't have to have a messy hydrometer syringe. The little balls tell us the whole story at a glance.

This extremely convenient two-ball system has been cleverly incorporated by the Philco battery makers into a little glass syringe which is designed to be kept permanently in one of the battery filler caps. You simply put the syringe in and throw the old cap away. After that you simply periodically reach in and squeeze the bulb,



let it go and draw some of the solution up into the glass part of the syringe where you can see it. If you cannot draw up enough solution to float the balls, your battery needs more distilled water. If both balls float, your battery is fully charged. If the red ball floats and the white ball tries to float, but gradually sinks, your battery is in pretty fair condition. If neither ball floats, it means you must not use the battery until it is charged up again.

I don't know how widely distributed these little charge indicators are, but I have no doubt Mr. Clarke can get one for you. Personally, I never use the old-type hydrometer syringe any more. I have one of these little fellows permanently in every battery in the laboratory.

Under the old system it was a bothersome job to charge the battery, anyway. It meant disconnecting the set, hunting up the charger, hooking it to the battery and plugging it into the light socket. I want to

show you, in this article, how all this bother can be done away with. I want to give several combinations to suit all cases and the result in each case will make the whole operation of the radio set as nearly automatic as possible. The object in each instance is to arrange things so that you

EVERY radio dealer can give you scores of instances in which the sale of a radio set was almost blocked the moment the woman in the case learned that she would have to have a storage battery in her home. The old-type storage battery of two or three years ago was certainly a messy-looking affair. It was notorious as an acid-spiller and no man has ever yet learned to use a hydrometer without dire consequences to his standing (if any) in his own family.

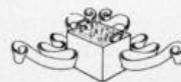
But times change and so have storage batteries changed. So, too, have we changed our attitude toward the necessary business of keeping our radio outfits always in tip-top condition. Formerly we just knew it was an unpleasant job that had to be done, so we put on our overalls, rolled up our sleeves, spread newspapers over the rugs and went to it.

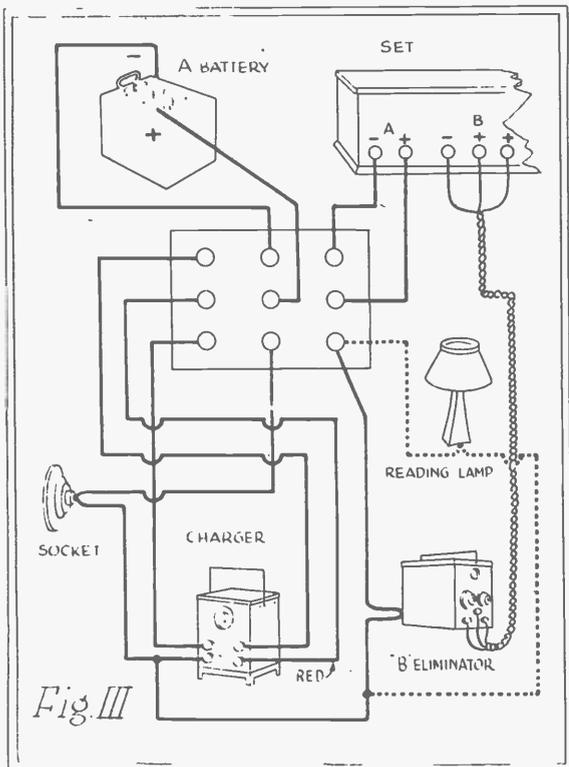
Since then, however, Mrs. and Miss Radio Fan have come into the picture—in fact, they are crowding up so close to the camera lens that Old Man Fan is now being relegated to the ranks of the "extras" in the mob scenes.

Manufacturers of storage batteries realized this change early in the game. They knew that if this feminine opposition were not over-

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throw a switch to one side to use the set, open it to disconnect everything or throw it to the other side to charge the batteries. All connections are made permanent; after installation, nothing is necessary except to open or close the switches. This is of immense value not only because it leads to dependable operation of the set but also financially, because, by removing the bother of charging, it means you will charge oftener and that means longer life for your storage batteries and consequently a saving of money.

Most beginners seem to find it difficult to decide how often or how long they should charge a storage battery. A hydrometer syringe or the little Philco charge indicator will tell them this. With the syringe, the scale should never read below 1200, and the battery is well charged when it reads around 1275 or higher. Full charge is 1300.

It is also possible to make a rough estimate of the time required each week for charging. For all practical purposes, you can regard the word "ampere" as a measure of quantity of electricity. You have been trained all your life to think of quantity of liquids in pints or quarts or gallons and of solids in ounces and pounds and tons. So you will have to think of the quantity of electricity as so many amperes, and you must remember that a "milli-ampere" is simply one one-thousandth of an ampere. We talk of "A" battery, or tube-filament current, in amperes and fractions because the amount of current used is considerable. Just so we speak of coal in tons and fractions of tons. The drain on our

what combination of tubes, you can estimate your battery drain in this way. When you buy your tubes you will see printed on the carton or the instructions the amount of filament current which the tube uses. Add all of these together and the sum will be the amount of electricity your set will take out of your storage battery every hour. I know that radio engineers will sneer at us for this explanation of the word "ampere," but we have neither the time nor the inclination to study the vocabulary which they have invented for more exact definitions. The definition which I have given is a short cut to understanding the operation of your radio outfit, and that is what you and I are after.

Now that you know how much electricity your set is going to take out of your battery every hour, you must find out how much your charger will put back into the battery and, after that, you are all right.

Most chargers have a charging rate of two or two and one-half amperes. This means that they will put back that much electricity into your battery every hour that you keep the charger working.

Just a word of caution here. It is always better to charge a radio battery at a low rate for a long period of time than to try to hurry things by using a high rate. Recently some of the radio magazines and newspapers have been carrying a plausible-sounding advertisement boosting a ten-ampere charger on the argument that it will bring your battery up quicker. It will—for a short time. But it will ruin your battery.

A five-ampere charger is fine for bat-

teries. "B" batteries, however, is comparatively small, so we use the smaller term, milliampere, for this, just as we talk of coffee and sugar and butter in pounds. The prefix "milli" simply means one-thousandth, so a pound is just about two "millions," if we may coin such an expression.

Now the filament of the standard 201A type of tube uses one-quarter of an ampere an hour. If you have four tubes in your set, each filament will draw one-quarter ampere in every hour of use, or the whole set will draw one ampere an hour from your "A" battery. If you have five tubes, you will take one and one-quarter amperes each hour from your storage battery. No matter what kind of tube you are using, or

teries rated at 100 ampere hours or more. If your battery is rated lower than that, use the two or two and one-half ampere charger. If it is rated at only thirty to fifty ampere hours, you will find it much better practice to get a charger that delivers less than an ampere and charge longer and oftener. In fact, that is always the best practice with a radio battery—charge low rate, long time and often.

Now back to our problem of the four-tube set. We have calculated that the set takes one ampere every hour out of our battery. Our charger is marked two amperes. Therefore, the charger will put electricity back into the battery twice as fast as the set will draw it out and so we will have to charge only half an hour for every hour we use the set. Most of us regular fans listen in about four hours a night. That would mean charging two hours the next morning, but, unless the battery is quite small—say, less than eighty-ampere-hour rating—this will be more or less of a nuisance. Incidentally, let me say that I have adopted this practice myself and charge my battery every morning. I put it on a charger when I go to breakfast and tell Mrs. Editor what time to open the switch.

If you don't want to do this, you will be perfectly safe in letting your debt to your battery accumulate until you owe it six or eight hours. If, however, Mrs. You uses the set during the daytime while Mr. You is at work, the daily use of the battery may amount to six or eight hours, and in that case daily charging is much the best practice.

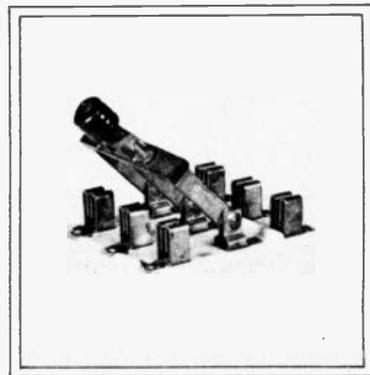
Look on your charging as a debt you owe your battery. Don't let the debt run too long or grow too big. It's just an ordinary business proposition.

Now let's look at the photographs of the two switches. Both are "double-throw" switches because you can throw them either to one side or the other and make different electrical contacts. One of them is a "three-pole" because it has, on each side and also on the handle, three separate connections and three blades on the switch. The other is a "two-pole" or "double-pole."

Therefore, in buying, you must ask for porcelain base "double-throw, double-pole" or "three-pole" "double throw" switches.

So we come to the diagrams.

Fig. I shows the installation for the



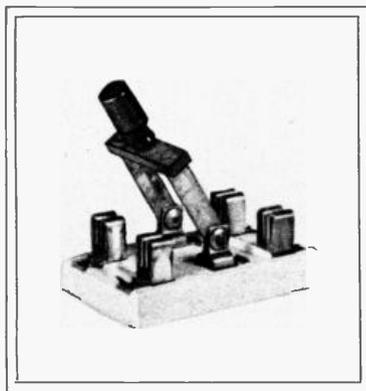
This is a three-pole, double throw switch such as is used in several of these hook-ups.

man who wants to insert his charger plug into a socket from which he must remove the light first. It is semi-automatic—that is, with the switch thrown to the right, the set is connected to the battery and ready for receiving. With the switch open, everything is cut off and there is no current anywhere. Even if your set has a filament switch on the panel, it is left in the "ON" position all the time. This new switch controls everything. You need not even think about the "B" batteries because "B" current never flows unless the tube filaments are burning. With the new switch thrown to the left, the charger is connected to the battery, but you will still have to remove the electric light from the socket and insert the plug on the end of the charger cord. That is why I call this arrangement "semi-automatic."

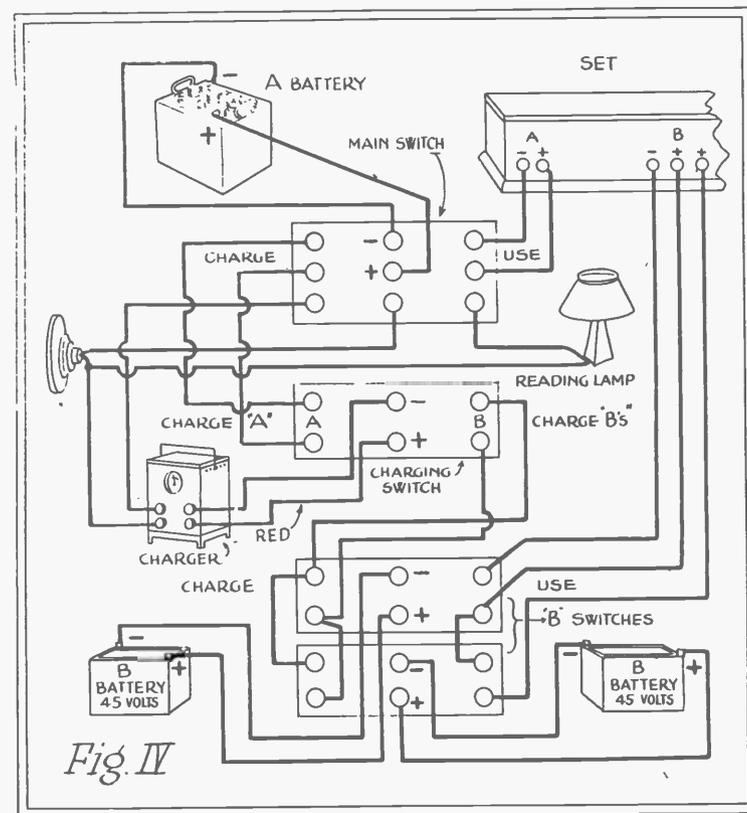
Fig. II shows a completely automatic arrangement which is much more satisfactory, but it requires a light socket or base plug which is not ordinarily used for a lamp and in which the charger plug can be left permanently. Here we use a three-pole switch and so arrange our wiring that throwing the switch to the left not only connects the battery to the charger but also turns on the house current into the charger. Opening the switch disconnects everything, while throwing it to the right not only connects the set for reception but also lights a table lamp or bridge lamp which is intended to be placed near the set to throw light on the panel and illuminate your dials so that you can see better for tuning. This reading lamp also gives you a factor of safety, for, so long as it is burning, you know your tubes are burning, too, even though your tubes are operating from your battery while the lamp is operating from the house-lighting system. Thus you will not go to bed and forget to turn off your set as so many of us have done so often in the past—to the great detriment of the storage battery. Of course, the connections to this lamp can be omitted if you don't want it.

Incidentally, it is possible that placing this lamp on top of the radio set may give you an annoying, low-toned hum. If it does, move the lamp farther away.

To make this installation, it is necessary to open up the cord of the charger that



This is a double-pole, double-throw switch which is used in several of the battery hook-ups in this article



goes to the base socket or lamp socket. One of the wires must be cut and connected to the switch as shown, and be sure to make these connections exactly as specified in the diagram. When this one wire is cut, the end running to the base socket must be connected to the lowest center screw of the switch and the end running to the charger must be connected to the lowest left-hand screw. If these connections are reversed, the switch will work the charger but it won't work the table lamp.

In hooking up this table lamp, one wire must go to the charger wire which has not been cut. Be sure of this.

In unlaying this charger cord, use care not to cut through the outer covering too enthusiastically. The cable is made up of very fine wires twisted together and these little wires are easily cut. After making the installation, be sure to tape the lamp connection carefully.

Fig. III shows this same installation carried even further so as to provide for the use of a "B" battery substitute as well as a charger. The table lamp connection is shown in dotted lines in case it is desired.

Here we have a most convenient outfit. It is really a copy of the combination "A" and "B" socket power outfits put out by Philco and uses about the same circuit, though the factory outfit is, of course, immeasurably better looking and neater for the home.

Throwing this switch to the left connects the battery to the charger and turns on the "juice." Opening the switch dis-

connects everything. Throwing the switch to the right lights the tubes in the set, turns the "juice" into the "B" substitute and lights the table lamp—all in one operation. How's that for convenience?

In this last case, it is also necessary to strip off the binder from the cable on the "B" substitute which runs to the house-lighting socket. One of the wires thus exposed is connected to the charger wire from the socket and the reading lamp connection can be made at the same point or the lamp can be connected at any place along that wire. Be sure to tape these connections.

Now we come to the most complicated arrangement of all—that for the man who is using a storage "A" battery and two blocks of storage "B" batteries. The complications are increased by the fact that the "B" batteries are used in series for receiving—that is, with plus connected to minus—but must be put in parallel for charging—with the two minus posts connected together and the two plus posts connected together. The diagram shows the method for making this shift by means of switches so that nothing has to be connected by hand.

In this arrangement we require one three-pole, double-throw switch and three two-pole, double-throw switches. It may look like a lot of trouble, but the installation is really quite simple and it certainly is lots less bother than the discouraging job of keeping this assortment of storage batteries

(Continued on Page 20)

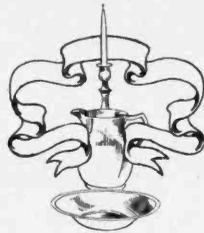
Have You Heard Betty Crocker?

WHEN I first saw the announcement that Betty Crocker was going to broadcast cooking talks and household hints from an imposing list of stations during the daytime, I wondered how the thing was going to be managed. I knew that it was impossible for the Bell system to clear up connecting wire lines at a time of day when the commercial demands of regular telephone service taxed to the limit every long-distance line in operation. So I listened in to our local broadcasting of Betty Crocker. And, as I did so, the explanation of the clever stunt came to me because it recalled an experience from my own newspaper career.

Some years ago there was a woman in New York who used to write "sob stuff" under the name of Beatrice Fairfax. Her stuff was put out by a syndicate for simultaneous publication in a number of newspapers. Then the woman died. Her name had acquired too valuable a following to be lost, and so the syndicate sold to each newspaper the right to the name and each newspaper trained its own woman writer to imitate the style of the original Beatrice Fairfax as nearly as possible. So Beatrice Fairfax survived and, for all I know, she may still be solving the heart problems for the little "sob sisters" in cities spotted here and there over the country.

I realized that Betty Crocker was being managed in much the same way. So I wrote to Mr. Buell and asked him to get the story for me. Here you see how it is being done. There are as many Betty Crockers as there are stations broadcasting the service, but they are all carefully trained by the original Betty.

I've met the Betty Crocker who does the work at W.E.A.F. She doesn't fit Mr. Buell's description of the original—"a youngish woman with graying hair"—no indeed! The best description I can give of her is to say that, when she walks into the studio, all the announcers forget to announce and they have to hang a curtain over the glass door to the control room so the operators won't let the tubes blow up. H. M. N.



The best answer is: She is the woman who puts the alarm clock on a double shift.

All over this great, wide Nation of ours housewives set the alarm clock for 10:45 A. M. as well as for the earlier rising hour.

When that b-r-r-r-ing is heard just as the morning work is well over and it is time to think of what to do about luncheon, the woman turns to the radio set.

They may have sat and scoffed all the evening before, ragging the impatient husband for trying to get this or that station just a little clearer.

But now, with the husband away at work and the children off to school, there is none to see them turn up the rheostat and swing the dials to the nearest big station.

Just how many women actually respond with a spoken "good morning" to the greeting given them by Betty Crocker will never be known, but those who know the lonely woman in the farmhouse, or the even more completely deserted woman of the city flat or the commuting district, may hazard a guess.

In any case, there are some hundreds of thousands if not millions of women who take half or three-quarters of an hour each day to rest from the morning work, to jot down a few penciled notes or recipes or just to listen to the friendly voice that talks about what to have for dinner or for the coming party.

And that is the secret of Betty Crocker. She knows that just at that hour of the day nearly every woman in the United States is asking either, "What shall I have for dinner tonight?" or "What shall I order for dinner tomorrow?"

You may see Betty Crocker when you call at the Gold Medal radio station of Minneapolis and St. Paul, or you may look her up or write to her at the office of the Washburn Crosby Company, which operates that station.

But when you have seen her and heard her, you may not claim to know her.

For the voice of Betty Crocker which you hear is not the voice which she uses in another part of the country. She has, to be exact, twelve voices. And though they belong also to twelve other girls, each in the city in which one of her twelve radio stations is located, they are, in truth, the voices of Betty Crocker.

Each of these voices is as truly hers as is the radio station engaged for the broadcast, for she speaks through each. In the most exact manner possible she projects her personality to you through these voices.

It is not alone that the important words are hers, but the very manner in which she speaks is prescribed by her. It is at her in-

Miss Sargent's Article

We must apologize for not including in this month's issue the second of the articles by Miss Jean Sargent, Director of Women's Activities at Station WHT, Chicago. Unfortunately, this article was crowded out of this month's number, but we will make every effort to print it in March.

H. M. N.

structions that the particular Betty you hear refers to the program that has gone before or comments on the weather or the latest news event.

And, above all, it is she who says to them:

"For heaven's sake, don't adopt the sickly sweet tone used by some women broadcasters. Speak like a human being and let your voice express friendliness if nothing else."

Betty Crocker is comparatively new to some of the listeners of twelve stations which are broadcasting her now, but she is well known in the daylight broadcasting radius of the Twin City Radio Station WCCO. For Betty Crocker was born more than a year ago, when the Gold Medal station was born, and she has long been the guide, philosopher and friend of thousands of women in Minnesota, Wisconsin, the Dakotas and Northern Iowa.

It is not just lately that she has marshaled the biggest cooking class ever conducted by a single individual. It was first formed soon after her talks began in the Northwest, and it had many thousands of listeners and hundreds actually fulfilling the requirements of the class and working for the diploma that was given.

"I have always wanted to graduate from something," wrote a woman over 90 when the first graduation exercises were held—on the air—"and now I have had my wish."

In the heart of the spacious downtown district of Minneapolis you will find a great, thick-stone monument of a building that is the city hall and courthouse. The largest building across the street is what Minneapolis calls the new Chamber of Commerce Building to distinguish it from the old chamber.

It is on the second floor of this great newer building that some thousands of people may be found working in the offices of the Washburn Crosby Company, and one of these is Betty Crocker.

A youngish woman with graying hair is about the best description of her, and her smile matches anything you may have pictured from that cheery "good morning."

To one who has visioned her buried in mail it was something of a shock to be led to a clean desk.

"The letters?" she said. "Oh, I can't let them pile up for a second or I'd be

RADIO has made a woman.

And her name is Betty Crocker.

To something like a million-and-a-half women in the United States there is no more real personal friend in the world than she.

Does she not talk with them daily?

Does she not exchange recipes with them?

Does she not furnish an unending array of tips and hints and suggestions or hunches that take the curse out of housekeeping and make cooking fun where it had begun to be drudgery?

And who is Betty Crocker, do you ask?

Sure! All of 'Em

By EARL R. BUELL

swamped. It takes all the stenographers I can keep busy to handle my mail.

"And, oh, those letters! Sometimes they bring tears to my eyes. That is why I never let any go unanswered.

"Look here." And with a sudden movement she threw open a file. "Do you see those? Let me show you something."

And she indicated paragraphs in a few:

"I am 10 years old. My mother is dead and I am trying to bake things. I think it is real fun to bake."

That was from Buffalo, N. Y. Betty Crocker has been a mother to a motherless girl.

"Ever since your talks have been given at WEEI, a great-grandmother of 84 and a grandmother of 62 have listened as eagerly as any bride."

That came from Boston. And this is from California.

"I am a woman of 30, up here in the high Sierras, twenty-five miles from the nearest woman and seventy-five from a railroad. We are working a gold mine and I do my part by cooking. Snow is here and soon we will be closed in for the winter, 25 to 35 foot fall and not open till May."

From Watertown, S. D., comes one most eloquent:

"I have moved my washday ahead one day so as not to miss your Monday morning talks."

"Can you imagine," Betty Crocker asked, "how these affect me? And these letters from blind people! They all seem to stop my heart."

"I am so interested in your talks," one writes, "and try to write down your recipes, but being entirely blind, listening and writing proves unsuccessful sometimes, so I am asking for your muffins and butterscotch rolls which you gave this morning."

"Perhaps you do not know," says another, "that men as well as women are listening. I am a man and without eyesight also. Your talks are interesting and helpful to me. I am keeping house for a family of three and, while I can cook most anything, what to cook is a problem with me. Your suggestions have been a great help."

"Can you imagine the value of such a contact as this to a business organization?" Miss Crocker asked. "I am told there has never been such a response to any form of publicity or advertising in which the company has engaged. We call it real service in the most acceptable form."

Take a look at the map of the United States if you want to

(Continued on Page 24)

Clever Plan Worked Out in National Broadcasting Feature So as to Overcome Impossibility of Getting Wire Connections Between Stations in Daytime

ATWATER KENT RADIO

"It is remarkable that anything so small can be so powerful. It's like hiding the Boston Symphony Orchestra in one of the upper drawers of my desk."

—WALLACE IRWIN



In the home of WALLACE IRWIN is the Atwater Kent Model 20 Compact, with Model H Radio Speaker

EVERY SUNDAY EVENING:

The Atwater Kent Radio Hour brings you the stars of opera and concert, in Radio's finest program. Hear it at 9:15 Eastern Time, 8:15 Central Time, through:

WEAF New York	WFL Philadelphia
WJAB Providence	WABC alternating
WEEI Boston	WCAZ Pittsburgh
WCAP Washington	WGLD Buffalo
WEAT Cincinnati	WAB Des Moines
WCCO Minneapolis-St. Paul	WTAB Worcester
WEAR Cleveland	KSD St. Louis
WELB Chicago	WVI Detroit

Prices slightly higher from the Rockies west, and in Canada.



Radio Speaker Model H, \$22



Model 20 Compact, \$20

THE famous author of "The Japanese Schoolboy" and "The Golden Bed" might be expected to impale a whole set of facts with one unerring phrase. This he has done in writing to us about his Model 20 Compact. And note what else he says:

"I approach a radio set much as I approach an automobile. I don't know what goes on inside, or why. I only know that if you turn something on, something is supposed to happen.

"For that reason I am an ideal Atwater Kent addict. I don't even have to turn it on. My oldest boy, aged 8, does that for me, and produces such music as I am sure Beethoven at the age of 8 never even dared to tackle."

So simple that even a child's fingers are sufficient. So small and so beautiful that it *belongs*— never intrudes—in any room, in any home. Yet a full-powered, robust, complete five-tube set that meets all your demands in performance. That is the Model 20 Compact, as so many persons who could buy *any* radio set have found out.

Write for illustrated booklet telling the story of Atwater Kent Radio

ATWATER KENT MANUFACTURING CO.
A. Atwater Kent, President
4800 WISSAHICKON AVE., PHILADELPHIA, PENNSYLVANIA

RADIO *and the* MUSIC STUDENT

Scheduled for Tuesday Evening, February 16
Broadcasting from Crosley Station W/LW, Cincinnati, on Tuesday evening, February 16,
the Formica Symphony Orchestra, conducted by William C. Stoess, will play

BEETHOVEN'S FIFTH SYMPHONY
No Music-Lover Will Want to Miss This

Beethoven's Fifth Symphony

BEETHOVEN'S Symphony in C Minor, Op. 67, the fifth of the nine symphonies composed by the master symphonist, has long been regarded by musicians as the great model symphony; and to the general public is the best known and most admired of them all—perhaps because it is the most human in its qualities. The composition of this colossal work in four movements occupied Beethoven's attention for many years. Sketches for its first two movements have been found in his notebooks as early as 1800; those two movements were written out in 1805; the whole work was completed in 1808, and had its first performance at Vienna on December 22 of that year.

Beethoven himself gave a clue to the meaning of his music, and with that clue practically all critics and commentators have arrived at substantially the same decision—namely, that it depicts the struggle of the individual man with Fate, the alternations of hope and despair attendant on that struggle, and the final triumph of the human soul. In speaking of the first four notes of the opening movement, Beethoven said, some time after he had finished the symphony, "Thus Fate knocks at the door."

Throughout the first movement (Allegro con brio), Beethoven has emphasized the importance of this simple but pregnant theme of four notes by using it an almost endless number of times, sometimes indicating it by a mere insistence of its rhythm in the bass.

The whole movement is filled with incidents of the fierce battle. There are cheerier episodes, however, that lend contrast to the music and hint at the fluctuations of victory over the relentless foe. It is a movement that imposes its greatness and its power upon the listener at every hearing, no matter how familiar he may have become with its every part.

After the turmoil of the first movement, with its thunderous proclamations, the second movement (Andante con moto) comes like a gleam of azure amid dark storm clouds, and breathes a benison of peace. This movement is made up of a marvelously beautiful theme and a set of exquisitely modeled variations, the whole charged with surpassing grace and ineffable loveliness. Heavenly melody is poured out with a lavish hand, and this is one of the best-loved slow

Conducted by
G. W. Harris

On Music

MANY love music but for music's sake:

Many because her touches can awake
 Thoughts that repose within the breast
 half dead.

And rise to follow where she loves to lead.

What various feelings come from days
 gone by!

What tears from far-off sources dim the eye!

Few, when light fingers with sweet voices play,

And melodies swell, pause and melt away,

Mind how at every touch, at every tone,
 A spark of life hath glisten'd and hath gone.

Walter Savage Landor (1775-1864).

Below is the Formica Concert Orchestra, directed by William Stoess, which has become one of the most popular of W/LW features, not only because of the talent displayed by members of this organization, but because of the varied type of program it presents. Concerts by this orchestra are given every Tuesday, from 9 to 10 P. M., from Station W/LW under the auspices of the Formica Institution Company



movements in all symphonic music.

The third movement, or Scherzo (Allegro), begins with a questioning phrase in the bass, but this gets a prompt answer in which it seems as if the youthful hero had grappled with the decrees of Fate and boldly turned his weapon against his foe. Question and answer are repeated. Then comes a rhythmically curt incident of a decided character, and these two episodes are developed with supreme cleverness. Now the trio of the Scherzo comes in with a droll scurrying of the bass; and when this occurs a second time the composer indulges his sense of humor by letting the bass make several false starts before finally it is launched fully on its brisk career. A repetition of the opening section of the Scherzo, with delightful modifications of detail, ensues, and this leads to one of the most magical passages that Beethoven ever penned, which, from a mysterious pianissimo, gradually grows in intensity until it finally bursts into the jubilant march that begins the fourth movement (Allegro), for there is no pause between the last two movements. This works up to a great climax, and the second part of the last movement (Presto) celebrates the triumph of the human soul in a marvelous expression of joy, unbounded and unrestrained—jubilant exaltation proclaimed with an abandonment of exultation.

Ludwig van Beethoven was born on December 16, 1770, at Bonn on the Rhine, whither his grandfather, Louis van Beethoven (born at Antwerp in 1712 of an old Flemish family), had gone in 1732 to become a court musician to the Elector of Cologne. He early showed such remarkable musical talent that his father, Johann (a tenor singer in the court chapel), stimulated by the stories of the wondrous precocity of Mozart, decided to make him into a boy prodigy. Ludwig was put hard to work, when 4 years old, learning to play the piano, the violin and the organ, and to compose music. At 8 he played the violin well; at 11 he could play Bach's "Well-Tempered Clavichord" fluently and skillfully; and at 13 he was made accompanist to the court band.

His first published composition appeared in 1782. His first symphony appeared in 1801. His only opera, "Fidelio," for which he wrote four over-

(Continued on Page 25)

Send for this RADIO BOOK FREE

1926 Catalog of RADIO BARGAINS Save 1/3 to 1/2



The World's Largest Exclusive Radio Mail Order House Will Send You This Wonderful Book FREE

64 illustrated pages containing thousands of bargains in radio sets, semi-finished sets and radio kits of all styles, sizes and approved circuits. Beautiful models of the very latest designs and types. Elaborate console models with loud speakers built right into cabinets of genuine mahogany and walnut. **ALL SETS GUARANTEED.** Coast to coast receiving range. Catalog also contains everything in radio supplies, including batteries, chargers, loud speakers, transformers, condensers, rheostats and any other parts you may want for improving your set or building a new one. Guaranteed saving to you of 1/3 to 1/2.

What Others Say

The set I've ordered from you is a wonder and I am very pleased with it. J. Cantello, 1524 Art St., New Orleans, La.

I received my 2 tube Radio set. Everything and all is A. and am well. William Kline, R. P. O. J. Box 27, Sumner, Ark.

My 2 tube Radiola working fine and I think it is one of the best on the market so far being New York. W. H. Woodfield, Troy, N. Y.

The 2 tube Radio I received from you is working fine. H. H. H. Roster No. 2, Webster, Iowa.

I received my American Bull set covers two months or so ago and am getting from coast to coast. (From Wichita, Kan.)

Box No. 1, Leno, Fla. Mont.

You must have our catalog no matter what set or kit you want. Our line is complete and includes all popular sets, such as **Superheterodyne, Neutrodyne, Ultradyne, Reinartz, Regenerative, Radio Frequency, Browning-Drake, Reflex** and all other latest circuits. Kits, sets and parts manufactured by all well known manufacturers such as: **Frost, Howard, Baldwin, Brandes, Western Electric, Columbia** and others.

OUR GUARANTEE
Every article exactly as represented. Every article is tested before shipping. Complete satisfaction or money cheerfully refunded.

DON'T BUY ANYTHING IN RADIO UNTIL YOU GET OUR BIG MONEY SAVING CATALOG.

RANDOLPH RADIO CORPORATION
The Largest Exclusive Radio Mail Order House in the World.
159 N. Union Ave. Dept. 252 Chicago, Ill.

Our Catalog
Includes complete list of broadcasting stations and general information and facts about our free service division. Our radio engineers will help you solve all your radio problems. Send your name and address on a card or in a letter. We will send catalog FREE.

This is a high resistance filament voltmeter

Exactly What Every Owner of Radiolas 25 and 28 Really Needs

—a quick and simple means of controlling the correct rheostat adjustment so as to prevent premature burning-out of tubes and providing for clearer reception.

R. C. A. cautions against excessive filament voltage and recommends the use of a high resistance meter to be sure of 3.0 volts across your tube filaments.

Here it is! The Sterling is designed especially for Radiolas 25 and 28. Provided with terminals to push into the two jacks on set. No fusing with cords or leads; always fits. Consumes less than 1/5 the current of one tube—leave it right in your set. A "High Resistance" meter. Accuracy paramount. Beautiful in appearance, worthy of any set's companionship.

Measure Your Voltage— better reception— save the tubes.

Packed in a beautiful maroon gold stamped case. Price \$7.50

THE STERLING MFG. CO.
Cleveland, Ohio

Sterling
FILAMENT VOLTMETER
R 25-28

Get the Correct Rheostat Adjustment

IMPROVE YOUR TUNING, USE—

BIRNBACH LOW-LOSS TUNER

Price \$2.00

For Distance, Volume and Selectivity

Birnbach Radio Frequency Coil \$1.00

For sale by
America's Greatest Chain Stores:
S. S. KRESGE CO. W. T. GRANT CO.

There's a Store in Your City

BIRNBACH RADIO CO.
370 Seventh Ave. New York City

Nightingale

THE UTMOST IN RADIO

DISTANCE, volume, purity of tone—all are at your command in unstinted measure when you make the Nightingale Six, the companion of your evening hours.

With the golden tube contacts, straight line wave condensers and other special features of the Guthrie Songbird Line, the Nightingale Six represents supreme radio value housed in cabinets of strikingly rich and appropriate design and finish.

Two stages of tuned radio frequency amplification, detector and three stages of transformer coupled audio frequency amplification afford a volume three times greater than can be secured with a five tube set.

Complete manufacture in our own shops give us control over every feature that is vital to your satisfaction. See the Nightingale dealer for any one of our several cabinet models or write to **THE GUTHRIE COMPANY, Grafton, Ohio**—holders of the famous Songbird Line.

It was hot work in the studio at W.E.A.F. when the first bridge game was broadcast. Graham McNamee, who did the talking, and Phillips Carlin, who played the hands on the top of the piano, had to take their coats off and roll their sleeves up to be comfortable.



Those Bridge Game Broadcasts

New Radio Feature Has Whole Country Arguing About Hands and Plays and Everything—and, of Course, the Experts Are Always Wrong

By G. P. Allen

HAVE you noticed any change in the subjects of conversation in the Pullman smokers, business offices, elevators, on the street, or in the homes of your friends? In the smoker it used to be, "Yes, it's a good town, but in New York—." At the office you were quite likely to overhear something like this, "—and he is the swellest dancer!" If you went to call on the Kings, "Yes, sir! KFI, last night, so loud that it woke Mabel right up out of a sound sleep! She put a wrapper on and came down to listen. Didn't you, Mabel?"

Every family has plenty of chances for arguments without any help from outsiders. We are beginning to recover from Red Grangeism; rehashing the World Series is rather flat: the neighbors know our opinions on the widow two houses down the other side of the street, and our remarks on prohibition have become trite through repetition.

Along comes the United States Playing Card Company, and in one-half hour of broadcasting starts more arguments than did the Volstead act or the League of Nations!

How many times have you come home from a bridge party and had a discussion about the fact that the "second hand should play low, and under the circumstances it was no place to play the ace of spades?"

"The very idea!"

"We should have set them three tricks!"

It isn't so bad when you can talk back, but to have to sit quietly and listen to a man tell you that you should bid four hearts over one no trump without knowing the

first thing about what your partner has isn't human nature.

"Shut the set off!"

"I will not! If I did, I shouldn't know how the hand came out!"

"Yes, I know he made it, but the only way any one could possibly make a hand like that would be to know where every card was before he started to play!"

"I shall not listen to such foolishness again. When did he say the next hand comes?"

We have some very nice young ladies in the editorial offices in Philadelphia. During infrequent trips to the office I have heard them discussing all sorts of things as they came in in the morning, or were returning from lunch. Last week their conversation gave me such a shock that I dropped a perfectly good new light gray hat and completely ruined it. They were discussing the bridge hand of the night before. It was the first time that I knew that one of them even owned a radio set.

On the train the other morning I happened to sit behind two well-known business men. Were they discussing the recent fluctuation in the stock I knew they were both interested in? They were not!

"Well, he said 'only once in twenty hands was the original bid played.'"

"He is all wet!"

"I took his word for it the other night over at Blake's, and I got set a hundred once and fifty twice and we didn't play twenty hands the whole evening."

In the elevator at the office the other day: "It certainly is a fine idea! The rule

Bridge by Radio

Broadcast by

WSAI, every Tuesday, 9-9:30 P. M.
(C. T.) started October 27

WEAF, WEEL, WFI, WGR, WWJ,
WOC, WCCO,

alternate Tuesdays, 10-10:30 P. M.
(E. T.) started October 27

KPRC, WFAA, WMC, WDOD,
alternate Tuesdays, 9-9:30 P. M. (C. T.)
started November 3

WSB, alternate Tuesdays, 9-9:30 P. M.
(E. T.) started November 3

KFOA, every Friday, 8:30-9 P. M.
(P. T.) started October 30

KGW, every Tuesday, 8:20-8:45 P. M.
(P. T.) started October 27

KHJ, every Tuesday, 3:30-4 P. M.
(P. T.) started October 27

WGY, alternate Saturdays, 9-9:30 P. M.
(E. T.) started November 7

KGO, every Tuesday, 9:30-10 P. M.
(P. T.) started November 3

WGN, every Wednesday, 3-3:30 P. M.
(C. T.) started October 28

GETTING THOSE SHORT WAVES?

Lots of Interesting Things

going on below the broadcast range of wave lengths. WGY—KDKA—KYW and many others are broadcasting programs down there.

Factory-built Sets Can't Get 'Em

You'll have to build your own. But it's easy. We've printed full instructions for two of the best all-round sets we've seen—for both low and broadcast range. Read both articles and then build the set that looks easiest for you.

Herndon's 37-800 Meter Circuit

uses only one coil in a clever new adaptation of an almost-forgotten principle. Covers the whole range without changing coils. Full details with pictures and diagrams were given in the January, 1926, issue.

Flewelling's Short-Wave Set

uses plug-in coils so that it will also receive the broadcasting range and even the higher waves. The Weagant-Reinartz circuit simply adapted to the inexpert set-builder and operator. Full instructions in the October, 1925, issue.

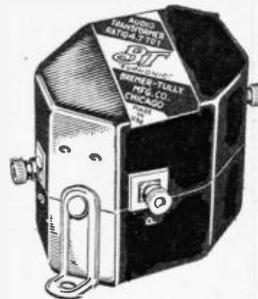
Send for These Two Numbers

and join the fun of short-wave reception. The two issues sent for 20 cents in stamps or coin. Address:

Circulation Department,
RADIO IN THE HOME

Public Ledger Building,
Philadelphia

EUPHONIC AUDIO TRANSFORMERS



Are pleasing to the ear because they deliver the full deep roll of the kettle drums, the low notes of the cello and organ as perfectly as the high notes. The advantages of the low-tone speaker are lost unless you use transformers that will deliver these notes.

When selecting the audio-transformers for your set, the best money can buy should be your choice.

With this thought in mind, Bremer-Tully engineers designed a transformer which performed so well that it suggested the name "EUPHONIC," which means "pleasing to the ear."

Ratio 2.2 to 1.....\$5.00
Ratio 4.7 to 1..... 5.75

Note the movable mounting legs which permit mounting in various positions. This makes it possible to place the transformer in the best position for easy and direct wiring and makes possible very short plate and grid leads. An exclusive B-T feature.

THE RESULT OF THEIR WORK IS AVAILABLE TO YOU. MR. SET BUILDER. ASK YOUR DEALER FOR B-T "EUPHONIC" TRANSFORMERS AND THEN YOU HAVE THE BEST MONEY CAN BUY.

Other B-T products include the following—

- B-T Laboratory Type Low-Loss Condensers
- Torostyle Transformers
- Nameless Kits
- Counterphase Receivers
- Universal Tube Sockets
- Radio Frequency Choke Coils
- Counterphase Kits
- Tuning Control's

BREMER-TULLY MFG. CO.

532 S. Canal St., Chicago



Radio's Danger Signals!

Do you know what's going on within your battery? Only a meter can tell you.

Weakness in your dry batteries has a tremendous effect on the efficiency of your set and this can be known only by frequent testing with a reliable pocket meter or panel meter. Sterling Pocket and Panel Meters will keep you well informed of necessary precautions you must take to maintain continuous good reception. These meters are made with exactly the right resistance as a protection against overdraining the batteries under test, and to give readings which are neither too high nor too low, but absolutely accurate. There is a type of Sterling for every need.

Price \$1.00 to \$6.00 Write for the Sterling Meter folders describing the various meters; or better still, see your nearby dealer.

THE STERLING MFG. COMPANY
Cleveland, Ohio

Sterling



METERS
"Tell the Truth"



Wilfred K. Bert, director-announcer of Station KFOA. Below is Howard J. Milholland, the announcer, who will handle the programs of the auction bridge on Tuesday nights from Station KGO



P. A. Greene, manager and announcer of Station WSAI



Left—Alfred program director-announcer of KPRC, Ho-

Right—Mrs. Busby, who handles bridge games WFAA, D.



Below—Kolin D. Hager, studio manager of Station WGY, Schenectady, N. Y.

of eleven does help when you get into a tight place."

The conversation of my friends is interesting. It is rarely that I hear any comment on any particular program. The conversation, so far as radio is concerned, is confined chiefly to the range of sets and the diagnosing of troubles in particular sets. I have heard comment on Goldy and Dusty, the Happiness Boys and the Philharmonic Society programs, and some comments in regard to "Roxy." But the broadcasting of the bridge hands has made more actual comment on radio programs than any one other feature that is now on the air.

Alternate Tuesdays find me at 10 o'clock with a card table and a pack of cards divided into four suits in front of me. Sometimes it is at home, sometimes at the house of some friends. The radio is tuned to the local station and we all await the announcement now so familiar to us. Everything is quiet until the hands are dealt and the bidding starts. Then the fun begins.

I am not a bridge expert, and if I call myself an average player it would be flattering myself a good bit. Nevertheless, it is fun to wonder, for instance, whether it is wise to play a seven spot so that your partner will know you wish the suit led again. If you listen in, you will wonder why a two was not played instead of a

Lieutenant Chester H. Miller, studio director and announcer of Station WEAN, Providence, R. I.



A bridge broadcast KHJ, the Times, Los Calif. The E. K. To the right Chamberlin announcer WMC. T Gaston radio editor con-



P. Daniel,
for and an-
Station
oston, Tex.



Oscar E.
reads the
for Station
las, Tex.



Freeman H. Talbot, program manager and
studio director of Station KOA

E. Lewis Dunham, "E. L. D.," who gives the
radio auction bridge games from Station WNAC

three; how you can be sure an eight spot in a two-card suit in dummy is going to take a trick, and just why it was advisable to bid five diamonds even though he did make six out of it.

Below—Frank Dahm, announcer for the Wednes-
day afternoon bridge games broadcast from
Station WGN

You will disagree with many of the things that are said, and you will talk about it with every one you know who plays bridge. Then if you listen long enough you will find that unconsciously you are trying some of the things that you have disagreed with. Some of the tight places that you get into during a hand will not seem so difficult as they did before. Without realizing it the discussion has been helping you. Although you still feel that the hands could not possibly be played the way they were on the radio without knowing where the cards were, next Tuesday (or at whatever time your station puts on the program) you will arrange to have some bridge-playing friends who have not a radio at the house to play with you. And if your cards are so dirty that you are ashamed to have your friends see them, isn't it only natural and fair that when you get the new ones for them to play with you should think of the United States Playing Card Company when you make your purchase?



You will not only get so interested that you will play the hands as they are broadcast, but you will sit down and write a real

(Continued on Page 24)

Richard V. Haller, director of Station KGW,
who will broadcast the bridge lessons

Below—Lambdin Kay, of Station WSB, the
Atlanta Journal, Atlanta, Ga.



game being
from Station
Los Angeles
Angeles,
announcer is
Barnes
is Francis S.
director and
of Station
to the left is
W. Grignon,
of the Wis-
News



The 1926 Model

"DIAMOND OF THE AIR"



Full Instructions for Building This Popular Set Combining Tuned
Radio-Frequency and Regenerative Detector With Great Efficiency
and Smoothness of Control

By **Sidney E. Finkelstein**

Associate, Institute of Radio Engineers

ONE of the most popular receivers for home construction is the 1926 model "Diamond of the Air," designed by Herman Bernard, of 145 West 45th street, New York City. This receiver well deserves its great popularity because:

(1) The radio-frequency amplification, achieved largely through the coil design, reaches the imposing factor of ten.

(2) The receiver is finely selective, used either with loop or outdoor antenna, and thus meets any aerial condition.

(3) The audio hook-up is one that produces splendid volume and excellent quality.

The set is wonderful as a distance-getter, which makes its appeal to the long-distance night owls a strong one indeed.

One stage of tuned RF, a regenerative detector, one transformer-coupled audio stage and two stages of resistance coupling comprise the hook-up. The binding posts W, X, Y, Z enable one, by removing two "straps" of bus bar, to use the Diamond's audio circuit with any external detector hook-up.

An important consideration is the smooth tickler control from lowest to highest broadcast wave lengths.

It scarcely seems possible to build a five-tube set of greater over-all efficiency.

This hook-up is adapted to the use of hi-mu tubes in sockets 3 and 4, while a lo-mu or power tube could be used in the last stage (socket 5). The grid bias there would depend on the tube used; in general, 9 volts negative will be used, i. e., two $4\frac{1}{2}$ -volt C batteries series connected. The RF and detector tubes should be of the 201A type.

The RF coil, Lo 1, is the Bruno 99 RF or 55 coil, while the three-circuit tuner is the Bruno 99. These are matched for the .0005 mfd. Streamline straight-line frequency tuning condensers C1 and C3. The grid leak Ro must be variable for best results. The Bretwood was used.

A is the beginning of the aperiodic primary Lo, in the antenna circuit, and is connected to aerial.

B is the end of that winding and goes to ground.

C and D should be watched carefully, as their source may be lost in the confusion of jack wiring. C is the beginning of the secondary L1, and is that terminal of the

secondary which adjoins the end of the primary Lo. In the laboratory receiver the Bruno coils were used, and these have binding posts on them, to which the coil terminals are secured. The wire terminals are not brought to the nearest binding post, but the wire is turned back, so that the winding is thus given added support, hence this is something to watch in determining

the beginning and the end of a winding. It is easily done at a glance, but might be overlooked unless attention were called to it.

C is the beginning of the secondary winding and goes to that inside spring of the jack which ultimately connects to minus A when the jack is closed.

D is the end of the winding and makes connection to the other inside spring of J1, which ultimately goes to grid. Trace this carefully. Note that the rotor plates of C1 connect to that terminal of the coil which goes to A minus, i. e., terminal C.

E is the beginning of the RF plate coil L2 and connects to the plate of tube 1.

F is the end of L2 and connects to B plus 45.

G is the beginning of the detector input secondary L3 and connects to positive A. The rotor plates of C3, the only other tuning condenser used, go to this lead, too.

H is the end of the secondary winding and goes to one side of the grid leak condenser combination. The other side of this combination goes to the grid post of the detector socket. An excellent precaution is to connect the grid post of the socket to the lug of the Bretwood variable grid leak farthest from the panel, while the lug close to the panel goes to the other side of the grid condenser and to the stator plates of C3. This is shown in the schematic diagram. The T terminal goes to the stator plates of C3, the connecting point being a lug on the insulation strip on the right-hand side of the tuning condenser. The connection to the rotor plates of C3 is made by soldering the lead from G direct to the condenser frame.

As for the tickler coil, since its angle of variation is very wide, there need be no special precaution about this wiring. As the flexible tickler leads on the coil are easily reversible, one may wire the tickler either way, reverse as a test, and retain that manner of connection which affords best results. Normally the same effect may be had with either method, because the reversal of current flow can be accomplished by turning the tickler out of its positive angle of variation into the negative angle.

The diagram published may be slightly confusing on one point. The binding post switch method used between the detector and the audio circuit calls for the joining

IT IS stepping a good deal aside from our regular policy to give a circuit developed by another magazine, but so many of our readers have written us saying that they have heard of the efficiency of the set known as the "Diamond of the Air" and asking us to send them the hook-up that we felt the best thing for all concerned was to print complete instructions and acknowledge our indebtedness to our esteemed weekly contemporary, "Radio World," and to Mr. Herman Bernard, who developed the circuit for them.

Ordinarily, also, we don't like to print circuits unless we can tell fans how to wind their own coils and let them use pretty much any make of parts they may prefer. In this case, however, if you want to get the full efficiency of the "Diamond of the Air," you will find it the best economy to follow instructions to the letter, just as they are given here. The various parts have been designed to work together and others have been chosen because experience has proved that they happen to work best in this particular circuit—although others might work even better in some other combination.

H. M. N.

"Bruno" Quartzite Coils

will improve the efficiency of any receiver. Replace your old coils with a set of these famous low loss coils and wonder at the difference.



Bruno "99" 3-circuit tuner. Wound on quartzite glass tuning with .0005 condenser and has wave length range of 175-575 meters. Price... **5.50**

This pair of matched coils are used and endorsed by Herman Bernard in the 1926 Diamond of the Air



Bruno "55" Radio frequency transformer. Matched with "99" tuner to have similar dial reading. Tunes from 175-575 meters ... **3.00**

BRUNO RADIO CORPORATION, N. Y. C., N. Y.

Sales Offices

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VEBY PRODUCTS

are used in Bernard's "Diamond of the Air" to the exclusion of all others

**GRID LEAKS
RESISTORS—TUBES**

A. F.-20 Hi Mu \$3.00
Tubes
A. F. 6 Power \$4.50
Tubes

**VEBY RADIO CO.
47-51 Morris Ave.
Newark, N. J.**

RADIO APPLAUSE

When you go to your office tomorrow you will almost surely tell the fellow at the next desk how much enjoyment some artist on tonight's radio program gave you. You'll be enthusiastic. Maybe he will have heard it and be enthusiastic, too. And you'll both agree that radio's a great thing.

But when you do this do you stop to realize that you aren't quite fair. With all that enthusiasm why not

Tell the Artist?

Just a scribbled postcard and a two cent stamp—that's all. Unless this radio applause comes in generously the artist will be discouraged and will not want to appear before the microphone again. But, with a goodly number of such cards coming in by each mail—there's ample pay! The consequence is the studio manager can easily get the artist to appear again. And so you help to make the kind of programs you want.

Send That Radio Applause!



Write for free hook-ups
Radiall Company
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36 Franklin St., N. Y. City

AMPERITE
The "SELF-ADJUSTING" Rheostat

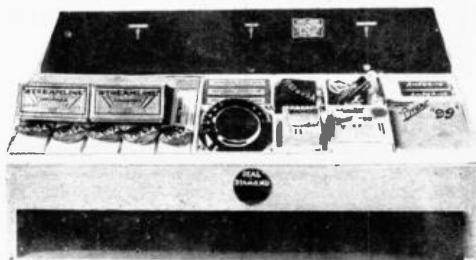
Help Your Friends Have Better Radio

More than half their troubles probably come from neglect of their batteries. Show them the article, "Taking the Bother Out of Batteries," in this issue. Then suggest that they ought to get this magazine regularly.

The Boxed and Sealed 1926

DIAMOND OF THE AIR KIT

bearing the seal and signature of Herman Bernard and the indorsement of 13 leading Radio parts manufacturers is yours for **\$35.00**



Showing how each bit is packed and sealed

Our Diamond of the Air Kit is complete in every detail even down to the last nuts and bolts. Each kit contains a full-size blueprint which will enable even the beginner to assemble this famous set.

We are one of the oldest and largest mail order houses in the East and we can save you money on anything you need.

Write for Free Catalogue

B-C-L RADIO SERVICE CO., Dept. H, 221 Fulton St., N. Y. C.

KURZ-KASCH ARISTOCRAT



Chosen for the "Diamond-of-the-Air" Kit

More manufacturers have adopted Kurz-Kasch products than all others combined.

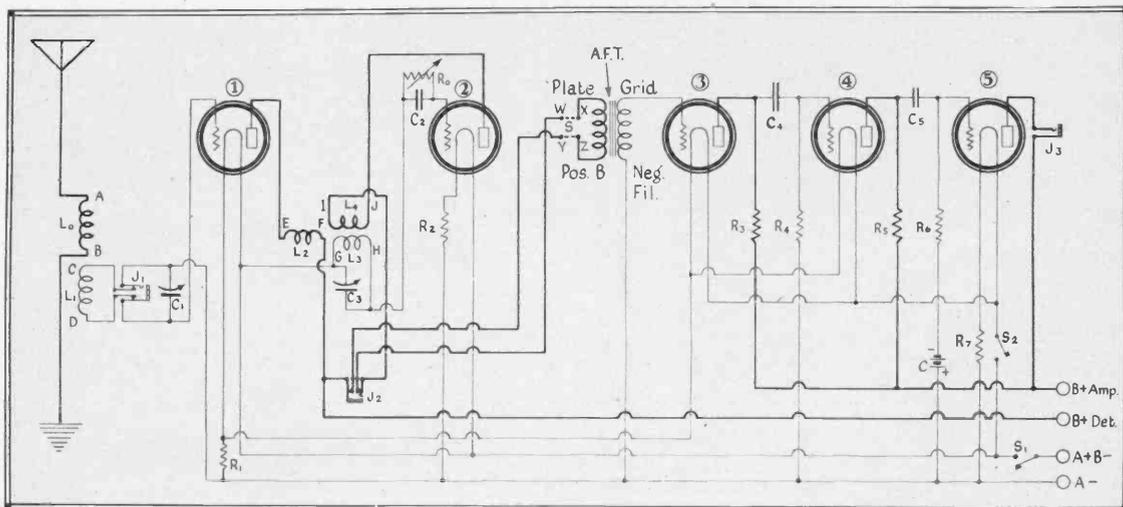
KURZ-KASCH ARISTOCRAT DIAL

The supremacy of Kurz-Kasch Aristocrat Dials is further exemplified by their selection for the famous Diamond of the Air Kit. The beauty of workmanship—the care in moulding—the expert die making—all combine to make Kurz-Kasch Aristocrat Dial the choice of the big majority.

Manufactured by

KURZ-KASCH COMPANY DAYTON, OHIO
LARGEST EXCLUSIVE MOULDERS OF BAKELITE

READERS will greatly assist this magazine if, when writing to advertisers, they will simply say: "I saw your advertisement in RADIO IN THE HOME."



of two pairs of posts by two separate little pieces of bus bar, called straps.

Wiring Directions

Join A plus to one side of the switch S1, the other side of that switch to the one side of the switch S2. The other side S1 goes to the F plus post of the RF and detector sockets (1 and 2). A minus goes to one side of R7, to one side of R2 and to one side of R1. The other side of R7 goes only to the F minus post of the last audio socket (5). The other side of R2 goes only to the

and F plus are the same, there being no resistor in the positive leg in any case. The end of the transformer secondary, marked Neg. Fil. on the instrument, goes instead to negative A battery, as shown in the diagram. The leak R4 goes to negative A, also, while R6 goes to minus C. The plus C post is joined to minus A.

Connect antenna to A, ground to B. That disposes of L₀. Connect C to one inside spring of the jack J1 and D to the other inside spring. Then carefully see that the outside terminal of the jack that

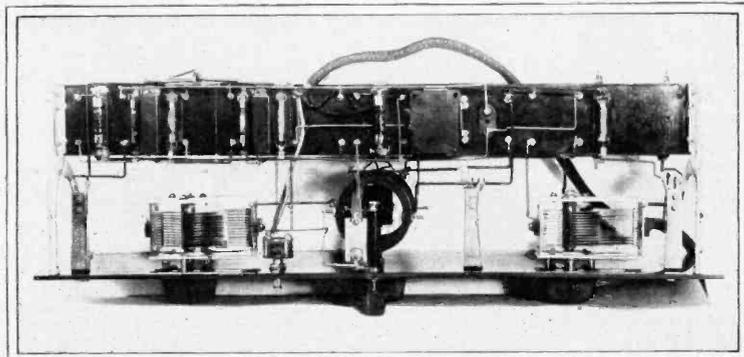
contacts with C goes to minus A and to rotor of C1, while the other outside terminal goes to grid of the socket 1 and to stator plates of C1.

Connect plate of the RF tube (1) to E, the beginning of L2, while the end of L, marked F on the diagrams, goes to B plus detector voltage. This is normally 45 and may be made to the frame of the jack J2. G terminal of L3 goes to A plus, H to one side of the grid condenser C2. The other side of the grid condenser is connected to the G post of the detector socket (2). G also connects to the stator plates of C3, the rotor plates of which go to A plus. The variable grid leak R₀ is connected across the grid condenser, the lug near the panel being joined to the H post of the coil and the other leak lug to the grid condenser, on the side of that condenser other than the one joined to the socket post.

The plate of the detector tube (2) goes to one terminal of the tickler L4, the other terminal of L4 to the only remaining outside spring of the jack J2. The other outside terminal of the jack went to B plus detector.

The inside spring of J2 that contacts with one outside spring that went to the end of the tickler coil goes to binding post W. The inside spring of J2 that contacts with B plus detector goes to binding post

(Continued on Page 28)

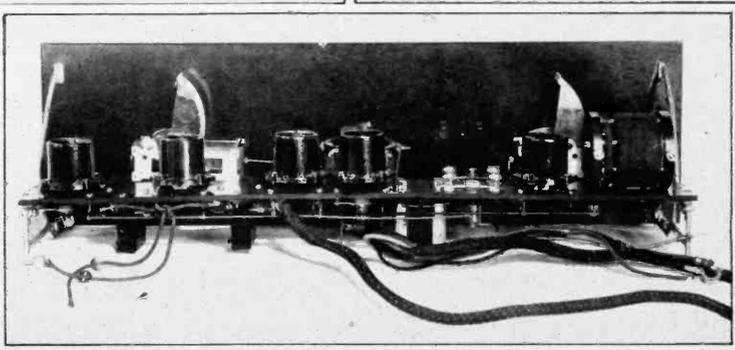


Above is a view looking down on the "Diamond of the Air," and to the right is a rear view showing the arrangement of the apparatus

F minus post of the detector socket (2). But the other side of R1 goes to three points. They are the F minus posts of the RF, first audio and second audio sockets (1, 3 and 4). The open side of S2 goes to the F plus posts of the three audio sockets (3, 4 and 5).

This completes the A battery wiring, but as grid returns go to these leads, connect them next.

C terminal of L1 goes through the jack J1 to minus A. Do not connect this to F minus on the socket. G of L3 goes to A plus at any convenient point. This may be even to F plus on any socket, since A plus



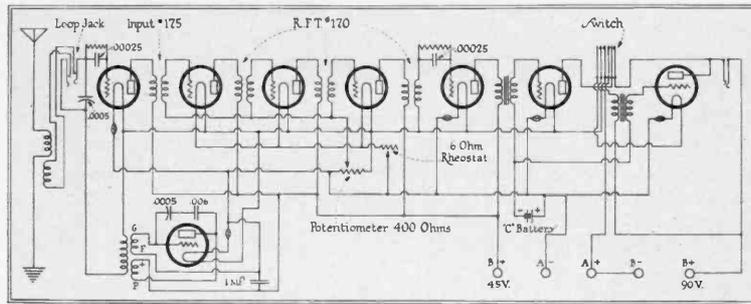


Fig. 1—Diagram of your super as it is now wired

Reaching Out for the Ultimate DX

How We Put an Extra Punch in the Victoreen Super So as to Be Sure to Get WGY in Daytime to Make Fading Tests

By G. P. Allen

Chief of the Laboratory at Station 3XP.
"Radio in the Home"

A POLOGY is hereby offered to Mr. George K. Burgess, Mr. J. H. Delinger and Mr. T. Parkinson, of the Bureau of Standards, as well as to Mr. W. R. G. Baker and Mr. C. J. Young, of the General Electric Company, for the remarks made by me in regard to them when Mr. Neely told me a daylight "fading" schedule had been planned with WGY. Had I not just signed a letter which said, "There is no receiving set or hook-up that I can recommend to you that will give you guaranteed 200-mile reception in daylight"? Station 3XP is just 205 miles from Schenectady, N. Y. I could see how we might possibly get the station under exceptionally favorable conditions, but to maintain a schedule was beyond my hopes!

So many of our readers have written in for information about covering great distances with receiving sets that it may be of interest to them to follow our attempts.

You all know that a signal must first affect the detector of a receiving set before we can hear it. You are also aware of the

fact that radio-frequency amplification boosts a weak signal so that it can affect a detector. Furthermore, a signal may be amplified after the detector by means of audio-frequency amplification to give volume. The audio-frequency amplification was eliminated by the fact that in the tests for the bureau we had to measure the received radio-frequency current.

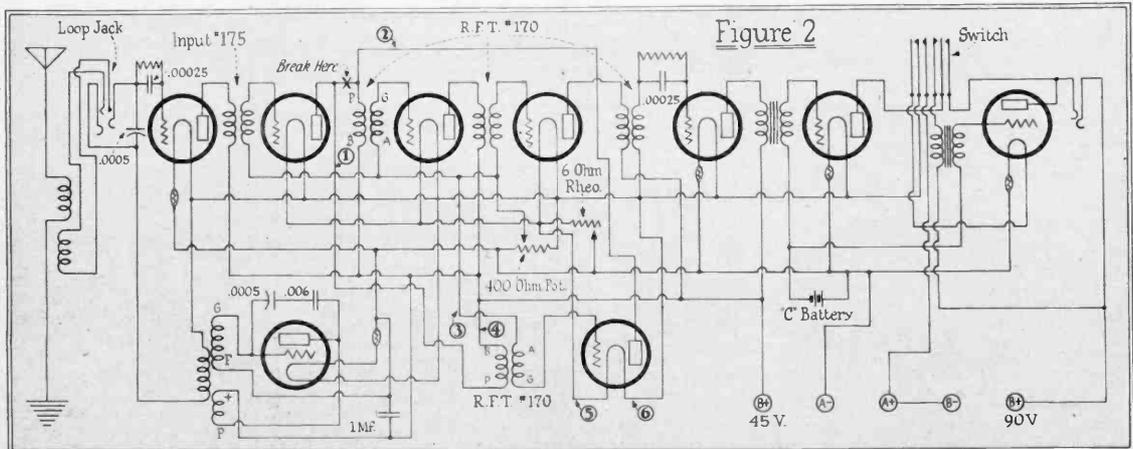
The first stunt tried was to construct an ordinary radio-frequency amplifier of two stages to place ahead of the first detector in a superheterodyne. This attempt was

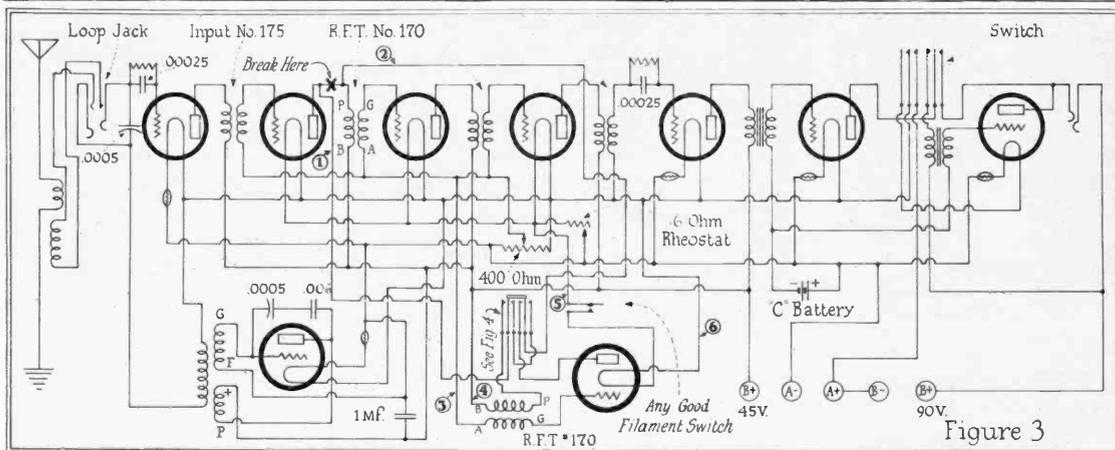
unsuccessful because the coupling coil used to connect the amplifier to the superheterodyne acted as a pick-up coil and the four local stations came through in such a volume that we could do nothing with it.

Mr. Clark in his article in the December issue makes the statement that it is useless to have more than eight tubes in a super. Mr. Clarke is absolutely correct in so far as broadcast reception is concerned. For any one who wants a superheterodyne for pleasure only, eight tubes is plenty. But for those of you who wish still greater distance with your super than you are now getting, I can recommend the stunt we finally adopted, and which gave us dependable daylight reception more than two hundred miles. However, you must expect to have more trouble with static, greater interference from doorbells, telephones, light switches and any of the other forms of "man-made static" than with an ordinary super on account of the increased sensitivity.

Mr. George Walker of the company

Fig. 2—Connections for permanent installation of extra intermediate transformer





manufacturing the Victoreen parts, was good enough to lend a sympathetic ear to our request for intermediate transformers to play with. The part of the equipment used for recording the fading is of no particular interest to a purely broadcast listener, so in the diagrams I am only showing the changes necessary for you to make in your super to put in an extra stage of intermediate-frequency amplification and obtain the same results that we did.

Fig. 1 is that used for the Victoreen super in the November issue. This is the

Fig. 3—The connections made with jack switches so that the additional transformer may be eliminated if not needed

standard superheterodyne diagram as your set probably now is wired. If you have a super of other make than the Victoreen or the Clarke, you can try this stunt on it if you are able to obtain an intermediate transformer of the same make you are now using. To add the additional intermediate

transformer you will need:

- 1 vacuum tube socket.
- 1 vacuum tube.
- 1 intermediate radio-frequency transformer.

All of these should be of the same make that you are already using in your present set. As you are probably no better able to afford two superhets at the same time than I am, I am going to outline a switching arrangement whereby you can use the additional stage or not as you may wish. Fig. 2 shows you how to incorporate the addi-

Coast to Coast on a Loop with a VICTOREEN Super Heterodyne

And We Prove It!

That is real radio reception. No oscillations, howls or squeals—no maddening of tubes. That means satisfaction and enjoyment for you.

Build your own "Victoreen"

You can secure complete parts to build the "Victoreen" from your dealer for between \$50.00 and \$75.00, depending on the quality of material selected.

Victoreen Air Core Transformers are more than matched—they are actually tuned to guaranteed precision of 1/3 of 1%—a Victoreen feature.

Either UV199 or 201A tubes may be used—another Victoreen feature.

"B" Battery consumption is remarkably low—8-10 Milliamperes with Potentiometer at negative side—less than some three-tube sets consume.

Range—clarity—volume—selectivity—ease of operation—that's what you get in a Victoreen Super Heterodyne.

Ask your dealer for a free folder and hook-up of the Victoreen set or write directly to us. Your dealer can supply you with all necessary parts.

The Heart of the Circuit

- 4 No. 170 R. F. Transformers at \$7.00 each.
- 1 No. 150 Oscillator Coil at \$3.50.

Should use of aerial be preferred to loop, the Victoreen No. 160 Antenna Coupler is required at \$3.50 extra.

The George W. Walker Co.
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Why Worry About Locals?

You don't have to write
letters to Hoover



complaining that the local stations interfere with your DX reception. You don't have to have 'em interfere at all. All you have to do is

Build the Right Set

In this issue, we tell you about the go-getter we built at Station 3XP for the tests in co-operation with the Bureau of Standards and WGY. Maybe you don't want a set quite so elaborate. What you want is the plain

Victoreen Super-Heterodyne

Without the extra trimmings which we put into this laboratory model. We gave full instructions for building the Victoreen Super in the NOVEMBER, 1925 issue.

Any fan can build the set from those instructions. It's a wizard for distance and selectivity. Send 10 cents in coin or stamps for a copy of this number. Address



Circulation Department
RADIO IN THE HOME
Public Ledger Building
Philadelphia

tional stage permanently in your set. Fig. 3 is the same arrangement with switches.

For the permanent installation, break the lead that goes from the plate of the first radio-frequency amplifier tube to the connection marked P on the intermediate radio-frequency amplifier at the point marked X in Fig. 2. A wire should be run from the plate of this tube directly to the connection marked P on the new intermediate transformer. From the connection B on this transformer run a wire to some point on the wire that supplies the B battery (B 45-volt in the Victoreen). Now from the connection marked G on the new transformer run a wire to the connection for the grid on the socket of the new tube. From the A battery connection on the new transformer run a wire to the line that is common to the intermediate transformers and which is connected to the arm of the potentiometer. From the plate connection on the socket of the new tube run a wire to the connection marked P on the old intermediate transformer. The only thing now not connected is the filament supply of the new tube. To do this run a

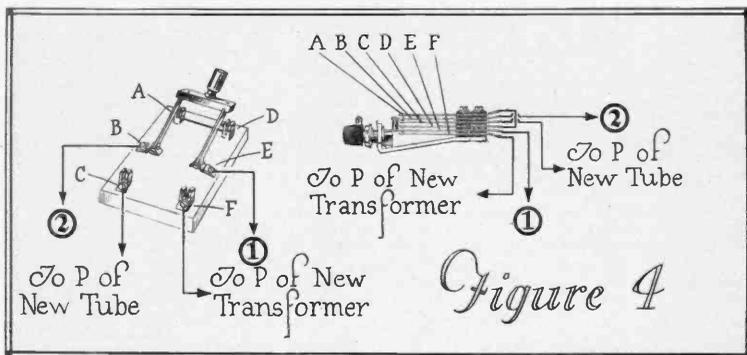


Fig. 4—To the left is shown the proper way to connect to a double-pole, double-throw switch and to the right the connections to a jack switch, either Yaxley No. 60 or Carter No. 6 or any good switch of this type

wire from the A minus terminal on the tube socket to the line which is connected to the 6-ohm rheostat that supplies the intermediate transformers. The A plus terminal of the new socket should be connected to the line that is the common positive supply of all the tubes.

If you are going to install switches so that you can listen for DX after the family has gone to bed, and yet have a standard

super for the early part of the evening, you will find the switch connections shown in 3 and 4. It is possible to use an ordinary double-pole, double-throw switch in place of the jack switch illustrated in Fig. 3. If you prefer to do this, you will find the connections for the double-pole switch in Fig. 4. Any filament control switch will do for use here, or you may use one of the pilot-light

switches so that you can tell whether the tube is turned on if you are not using it.

With the Victoreen parts we had no trouble from oscillation in the intermediate transformers caused by coupling between their fields. In case such trouble develops in your set after the addition of the extra stage, you have two chances to cut it down. The first would be to turn down the filament rheostat or turn back the potentiometer. This may have the effect of destroying the punch of the extra stage. The other thing to try is to connect the wire numbered 3 in the Figs. 2 and 3 to a separate potentiometer instead of to the potentiometer to which the other interme-

Kit Complete Parts Victoreen Super Heterodyne Set Special at \$69.50

Including the Same Parts as Described in This and Other Issues of Radio in the Home

We have sold more than 200 of these 8-tube Kits all over the country to enthusiastic owners who write us most glowingly of results. A wizard for Distance, Selectivity, Volume. Tune out any local station and get real DX on two-or-three meter wave distance. One of the few super-heterodynes with air-core transformers. No self-oscillations, whistles or squeals. Easier tuning because air-core transformers operate at higher frequencies. A demonstration will convince you. Tubes, batteries and aerial, of course, not included. Packed, ready for you anywhere.

Another M. & H. Special Kit Complete Parts "Diamond of the Air" Set \$35

As Described in This Issue, Radio in the Home Wonderful DX getter. A radio frequency circuit so wired that it will not spill over. A 4-tube set that will bring DX in on loud speaker.

Kit Complete Parts 6-Tube Counterphase Bremer-Tully Set, Special, \$33

A kit that combines resistance and capacity as a method of control of radio frequency oscillation. Of great interest to all fans.

M. & H., the House That Supplies Your Favorite Kit at a Price That Pays You to Build It Yourself

Kit Complete Parts, New 6-Tube Silver-Marshall Set \$42.50

One of Most Popular Sets on Market The only circuit with interchangeable radio-frequency tuned transformers. Takes all wave lengths.

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Regular Price \$28

The popular 5-tube, tuned radio-frequency circuit—at a price that has no equal. Wonderful selectivity. Two stages radio frequency, detector and two stages audio frequency. Only few kits made up. Order today. Tubes, batteries and aerial, of course, included.

Kit Complete Parts Hammerlund-Roberts The Most-Talked-of Circuit Today—Special, \$49.50

Send 25c for Booklet Describing This Circuit The result of combined efforts of ten nationally-known radio engineers.

Build It Yourself and Save Money KIT NEW 3-TUBE CIRCUIT \$19.50 Described by HARKNESS

The latest 3-tube set with range and volume of any 5-tube set on market, described by Harkness in many issues of "Radio in the Home." Neely, in "Radio in the Home," says: "Undoubtedly the two most popular circuits brought out during the past season were the Roberts' Knockout, developed by Radio Broadcast, and Harkness Counterplex, exploited by "Radio in the Home." Each circuit has its ardent advocates who claim it is better than the other.

We Still Have a Few Harkness Licensed Kits at \$17.50

Herdon Coils 37 to 800 Meters \$5.00

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29 Years' Experience Back of Each Sale

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Free Shipping Service for
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I will buy any parts or sets mentioned in this magazine and send them to you at their regular price. I make no charge for this service. For quick replies, telegraph. I'll send it C. O. D.

ARE YOU ACQUAINTED WITH THIS SERVICE?

It is not a cut-price scheme, but was instituted two years ago, so that readers could readily obtain parts identical with those used in the sets described. I send you only those parts that I have TESTED and KNOW to be good.

I have done the Experimenting
You buy a CERTAINTY
All Parts are UNCONDITION-
ALLY GUARANTEED

STOP FOOLING WITH RADIO and build the SUPER-TONE OCTETTE

fully described in December, 1925 issue of this Magazine. Read H. M. Newby's endorsement of the Quality and DX Ability of this set.

The ESSENTIAL PARTS

consisting of the
SUPER-COIL-
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SUPER-TONE
H E T ENOFORM-
ERS and SUPER-TONE FILTER
UNIT

Send \$1 for complete set of full-size blue-prints and hook-up diagram. This is the LAST WORD in Radio. Never before has such TONE been achieved.

QUADRAFORMER

This wonder set is fast becoming the most popular set in the country. Don't delay building it any longer. It will do on an outside aerial all that any super will do on a loop. And remember, we guarantee the circuit and all the apparatus.

We Have the
NEW QUADRACOILS \$12.75
(Per set of three)

Our STANDARD Kit \$45.00
Made up in exact accordance with Gearhart-Schluster's literature.

OUR DE LUXE KIT
Composed of the best parts money can buy. \$65.00
Special at

Write for complete information on these kits, also for the Gearhart-Schluster booklet. It's FREE.

Victoreen 170 Transformer. \$7
Benjamin Tube Socket. \$1
Yaxley 60 Jackswitch, \$1.25

These parts needed to add the fourth intermediate stage to the Victoreen Super Het described in this issue.

WE have a complete kit for building the
"Diamond of the Air"
described in this issue. Write for list of Parts and Prices.

E. M. CLARKE
1523 Chestnut St., Phila., Pa.

diate transformers are connected. In this connection it is interesting to note that the intermediate-amplifier tubes gave full volume for us when using only three and one-half volts on the filaments instead of the rated voltage of five. As raising the voltage to five gave no increased results for us, it is resulting in a considerable saving in the life of the tubes and batteries.

Let me again warn you that you will have more interference with the additional stage of intermediate-frequency amplification. In order for us to get the necessary records we had to move the receiver three and a half miles to find a place sufficiently free from electrical disturbances of industrial plants so that we could hear WGY after we had tuned it in. At that, every time a light was turned on, a phone rang, or a Ford parked near the antenna, the needle of our indicator jumped twenty points. Remember, this hook-up is intended for the fan who gets more pleasure out of a squawk from a station 2000 miles away than from the finest kind of program at stations near his own home.

If it is distance that you want, the extra stage is "the cat's pajamas."

Have You Heard Betty Crocker? Sure! All of 'Em

(Continued From Page 11)

know where Betty Crocker's voice is heard.

Trace the cities west as they are listed: WEEL, Boston; WFAF, New York; WFI, Philadelphia, on the Atlantic Coast. WCAE, Pittsburgh; WGR, Buffalo; WEAR, Cleveland; WWJ, Detroit; WHT, Chicago, through those Central Lake States.

KSD, St. Louis, on the Mississippi; WDAF, Kansas City, and then a big jump to KFI, Los Angeles.

There you have the line of stations that takes care of the rest of the country, while WCCO, the Gold Medal station. Washburn Crosby's own, is handling the North even into Canada.

There are not many persons in the United States who cannot hear Betty Crocker's voice if they like.

And you may find significance in the fact that this "chain" broadcast is getting the response it is, for there isn't the slightest attempt at entertainment in it.

It is service. That is the ideal of WCCO broadcasting and Betty Crocker is its chief exponent.

This service, too, is doing something that other broadcasting has found most difficult. It is winning the women to radio.

It must be admitted that women have been hard to woo

with the earphones. Even the loud-speaker and the "DX" bug have had few charms for them.

Some of the radio dealers in the Northwest have been going out of their way to boost this broadcast.

Betty Crocker is getting the women.

She tells them about going to market, giving parties, decorating things and places, planning entertainment and menus. She discusses Thanksgiving and Christmas dinners and means of using left-overs.

She explains the value of milk diet. She tells fat people how to reduce and thin people how to gain.

She wields more influence than Mrs. Calvin Coolidge.

Don't let anybody tell you there isn't any Betty Crocker. If there isn't, then there isn't any Santa Claus.

Those Bridge Game Broadcasts

(Continued From Page 17)

fan letter to the company. You will ask them to send you in advance the hand to be played so that you and your friends can play it in all possible combinations, and then, when the hand is played by radio, you will be sure that the players didn't know what they are doing. If you do send in your name, the advance information as to the hand and full information regarding the back hands will be sent to you without charge. Only don't make the mistake a friend of mine did and send in the names of your bridge friends to have the game sent to them! One young lady indignantly demanded: "Who thinks I play such a rotten game of bridge that I need bridge lessons? Some one had all twelve of the radio bridge games sent to me!"

How the Game Is Broadcast

By H. M. N.

It was my good fortune to be in the studio of WFAF the first night that the bridge games were broadcast over the link of stations. It is not often that you find an air of uncertainty in the well-ordered arrangement of WFAF, but there was unquestionably a spirit of anxiety hanging over everybody that night. The bridge games were something entirely new and untried; nobody knew whether they would be popular—in fact, nobody knew whether they could be "put across" so that they could be intelligently followed by the audience.

Paul A. Green, one of the officials of the United States Playing Card Company, and the man who has been most obvious in this whole campaign, was at the studio prepared to do the announcing himself, but as the

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Enclosed Send \$1.00 Bill. Please Rush BLAX to me.
Name

time came his own doubts in his own ability to get it over made him hesitate, and a last-moment decision was reached to have Graham McNamee do the actual reading of the manuscript before the microphone.

McNamee and Green retired to another office while Goldy and Dusty finished their work in the small studio, and they were still in consultation while the Eveready group was putting on its program in the big studio. When the time came, McNamee and Phillips Carlin went into the small studio deserted by Goldy and Dusty, but even then they were most obviously not at all sure that everything was going to be successful.

I doubt if these two veteran announcers have been so nervous since they started their careers before the microphone. Ordinarily they do not care how many of their friends gather around them in the studio and sit around while they are doing their announcing, but that night they locked themselves in the small room and would not let any one come in with them. The uncertainty of the job got on their nerves so that the atmosphere in the studio grew too stuffy, and both men, just before the moment to begin came, pulled off their coats, rolled up their sleeves and looked for all the world as if they were going to tackle a job of ditch digging on a hot summer day.

Carlin got the deck of cards and spread them out in suits on the top of the piano. McNamee brought over a music stand with a microphone at the top—one of the stands used by Goldy and Dusty—placed the manuscript on this stand and began going over it to himself before the microphone was cut in.

Just at that time Mr. Green had the happy thought that the best way to test the effect of this broadcasting would be to have four bridge players go in to Mr. Holman's office adjoining the reception room, where there was a loud-speaker that could be connected with the set. They took a deck of cards with them and these cards were divided into suits just as McNamee was telling his audience to do. It was a very good thing that this check-up was made, because it was soon discovered that McNamee was broadcasting his directions as to hands entirely too fast to be followed by the ordinary nonexpert players. A messenger was immediately sent to the small studio to tell McNamee to slow down, and in this way the speed was accurately arranged.

As Mr. Allen has said in his article above, these bridge games have started more arguments than anything that has yet been done by radio. The arguments started right then and there in the studio of WEAf on that

very first night. One of the first plays given by the microphone—I don't remember exactly what it was—was that the man playing Mr. Whitehead's hand would now play the four of clubs. "I'll be darned if I would," said the man who was playing Mr. Whitehead's hand in Mr. Holman's office, "I would play the deuce."

Right away the argument began at that table, and it would have interfered seriously with the rest of the reception of the broadcast if some one had not told them to keep quiet and do exactly as they were being told by radio.

When the broadcasting was over, Graham McNamee came into the reception room and slumped down wearily on a divan.

"Phew!" he exclaimed, "that was harder work than broadcasting a half-dozen football games."

It seems to me that this is the secret of the popularity of the broadcasting of bridge lessons. There is an old saying that there are three things which the average successful man feels that he could do better than they are being done now—run a newspaper, conduct a theatre and manage a hotel.

To these may now be added the playing of a bridge hand better than the expert plays it. I doubt very much whether there is in all the length and breadth of this land one game out of ten in which the players do not dispute the instructions given them by radio. But, as Mr. Allen points out in his article, continued hearing of these bridge games soon brings on a realization that the expert, in giving the instructions that he does, has a much deeper knowledge of the game than I have, and that there is always a good reason underlying every card which he makes.

This broadcasting certainly bids fair to make the United States a nation of bridge experts. Judging from the letters which come to this editorial desk, it is one of the most popular features which radio has to offer today.

Radio and the Music Student

(Continued From Page 12)

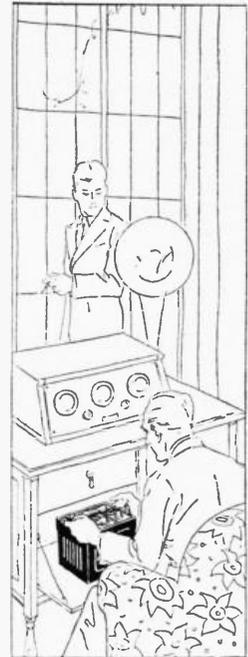
tures, was produced in Vienna in 1805; his oratorio, "Christ on the Mount of Olives," in 1812; and his colossal Ninth Symphony, with its choral setting of Schiller's "Ode to Joy," in 1824.

After his mother's death, never knew any happiness in his when he was 17, Beethoven home life. Family troubles saddened, depressed and embittered him. He was afflicted with increasing deafness, which became total when he was 50. His life was mainly a struggle against adverse fate; and while he never distress was so great that he often thought himself on the

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verge of ruin. He died in Vienna on March 26, 1827.

Beethoven's works comprise 138 opus numbers and about 120 unnumbered compositions. Principal among them may be mentioned the following: Instrumental—nine symphonies; really suffered want, his mental nine overtures; two octets; one septet; two string quartets; sixteen string quartets; five string trios; eight trios for piano and strings; one violin concerto; five piano concertos; ten sonatas for violin and piano; five sonatas for cello and piano; thirty-two piano sonatas; twenty-one sets of variations, and many other piano pieces. Vocal—one opera; one oratorio; two masses; various cantatas and choruses; sixty-six songs for solo voice and piano, and seven books of English, Scottish, Irish, Welsh and Italian songs.

In the scope and power of his achievement, Beethoven must be

ranked as the greatest musical genius the world has yet known. The commanding position which he holds in the history of art cannot be stated in a single formula. Belonging partly to the eighteenth century and partly to the nineteenth, in his work of different periods are to be found the controlling ideas of both those centuries. He was the end of an old dispensation and the beginning of a new; a connecting link between classicism and romanticism. In his music classical form reached its highest maturity; and he was the first exponent of individualism in music. His epic works, like the Fifth Symphony, are differentiated from all that preceded them by a mood of profound subjectivity, of individual, powerful soul-expression. His supreme power is shown not alone in his works but also in his commanding influence on the lead-

ing composers who have lived since his time.

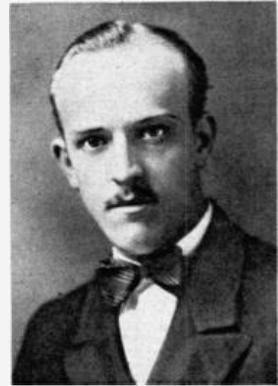
If you want music of this supreme type in your radio entertainment, you can get it only by letting the studio managers know of your preference. At present they feel that the public does not want the "classics." So it is your duty to yourself, as well as to the orchestra, to send an applause card or note to Station WYW after you have heard this symphony.

Aids to Appreciation

The literature about Beethoven is, of course, very large, and includes many volumes in German, in French, in English. The standard and most complete biography is the monumental work produced in German by the American scholar, Alexander W. Thayer, and completed and translated into English by Henry E. Krehbiel; published in three volumes by the Beethoven Society of New York,

and procurable from G. Schirmer, New York, at \$20 for the set.

A short biography by Frederick J. Crowst (in the Master Musicians Series) is imported by E. P. Dutton & Co., New York. "Beethoven and His Fore-



William Stoest, Director of the Formica Orchestra

runners," by Daniel Gregory Mason, published by the Macmillan Co., New York, contains three interesting chapters on his life and the characteristics of his music.

Beethoven's Fifth Symphony in a piano arrangement for four hands is published by G. Schirmer, New York, at 60 cents.

Phonograph records of the Fifth Symphony are the following:

Columbia Records—

Andante (Second Movement) played by New York Philharmonic Orchestra (A5954), \$1.50.

Played by London Symphony Orchestra under Felix Weingartner, the Fifth Symphony complete in eight parts, on four records (Masterworks Set No. 12), \$6.

Victor Records—

Played by Victor Concert Orchestra: 1st Movement (18124), \$.75; 2d Movement (35580), \$1.25; 3d Movement (18278), \$.75; 4th Movement (35637), \$1.25.

Played by La Scala Orchestra under Arturo Toscanini: 4th Movement (6304), \$2.

Reproducing Piano Records:

Duo-Art—

Played by Albert Stoessel: 1st Movement (5030), \$2.50; 2d Movement (5040), \$2.50; 3d Movement (5020), \$2.50; 4th Movement (5050), \$2.50.

Ampico—

Played by Suskind and Loesser, conducted by Artur Bodanzky: 1st Movement (58327H), \$2; 2d Movement, Part 1 (59323H), \$2; 2d Movement, Part 2 (59335H), \$2; 3d Movement (60213H), \$2; 4th Movement (60223H), \$2.

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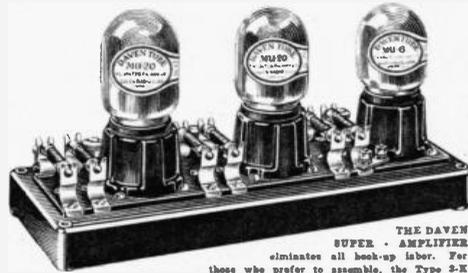
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THE DAVEN SUPER-AMPLIFIER eliminates all hook-up labor. For those who prefer to assemble, the Type 2-K Kit is complete except for sockets. For 50% more volume use the new Daven Tubes Type MU-30 with the Daven Super-Amplifier. Daven Power Type MU-4—for the last stage of any set.

Volume and Quality

As an owner of a radio set you should demand two things: (1) Volume on the weakest signal. (2) Tone quality that makes criticism impossible and excess or qualifications unnecessary. Why sacrifice one for the other? Demand both. Today it is a simple matter to have both.

It is easy to get volume but there is only one way to get both quality and volume. Use Resistance Coupled Amplification in the audio end of your set. We have made this very simple by developing the Daven Super-Amplifier. Or, if you prefer self-assembly, couple up Daven precision-built resistances and mountings as contained in the 2-K Kit. Then you will hear Radio at its best.

Three new Daven Products were announced this Fall. The Daven Leakandenser is a Daven grid leak of permanent and constant value, combined with a grid condenser of fixed capacity, correct for all makes of detector tubes. Precision-built, simple, effective, uniform and very handsome. A pair of mounting clips included.

The new Daven High MU Tube Type MU-30, used with the Daven Super-Amplifier, is designed to give 50% more volume—6 volt. ¼ ampere. The Daven Power Tube Type MU-4 is for use in the last or output stage of any set regardless of the method of amplification used—6 volt. ¼ ampere.

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Editorially Speaking

(Continued From Page 4)

send one dollar every year to help defray the expenses of a station which has done more to advance the public estimation of radio than anything that has yet happened to us.

Naturally, this result has been brought about not merely by high power, but because the use of high power has spread good reception of programs which I personally consider the very best programs offered by any radio station in the United States—that means, also, in the world.

We, at the experimental station in Delanco, N. J., had never been able to get Station WJZ, and it had always been one of our greatest disappointments in radio. I know of no other station which has uniformly maintained so high a standard in program-making or a higher standard in technical perfection in transmission. Day after day our local papers carried the programs and we saw events being broadcast which we felt were very decidedly worth listening to, but we were never able to bring them in with sufficient volume to make listening a pleasure. Today, however, thanks to the big station at Bound Brook, we are able to get these programs with all the clarity and volume of a local. The supposed blanketing effect of this high power has not materialized because, on any fairly good set which we have at the laboratory, we have to tune carefully to get this station at its best, and a degree or two on the dials will tune it out entirely.

I have also operated sets in the heart of New York City and have had not the least difficulty separating the stations. Naturally, people in the immediate vicinity of Bound Brook are being "blanketed," but so would they be in a smaller area, by a 500-watt station. Some one has to be blanketed by every broadcasting station, no matter how small.

I do not know how much extra territory of efficient coverage this high power has given to WJZ, but I trust that these signals are going out with equal satisfaction for many hundreds of miles, because we all feel that programs of this kind are going to do more to boost the radio business in general, and the business of a good radio magazine in particular, than anything else that we can imagine.

So far as reception at our laboratory is concerned, this transmission by WJZ is much more satisfactory than was the high-power transmission of WGY. We are, however, not in a good position to judge the technical aspects of the two stations because WGY is, unfortunately, a most persistent fader at Delanco, and fading brings

distortion of signals. Station WJZ, however, rides in strong and even and consistent and brings a constant joy with it.

As I see the future of radio, this high power is only a step in the ultimate perfection of the art. I have many times heard this stated by David Sarnoff, the vice president and general manager of the Radio Corporation, and after each of these speeches, I have heard many of his audience dispute his assertions in conversations among themselves. Mr. Sarnoff's vision apparently has been more farsighted than theirs. The retransmission on New Year's night of the signals from London was certainly not a complete technical success, but there were moments when the voice and the music were received from WJZ with such startling clarity that only one who is mentally blind could fail to perceive that here at least was a

proof that international radio is just around the corner. Even these short periods of almost perfect retransmission were sufficient to show that the greatest stumbling block has been removed and that the ultimate perfection of this method of international communication is merely a matter of further engineering advancement.

I hope I will not tire the readers of this magazine by repeating once more what I have so often said recently—that the day of the small transmitter is done. We are entering an era where radio must assume at least a national importance to be considered with any seriousness, and where the international aspect must be taken into account by every one who hopes to survive in broadcasting fields. The little local fellow may have his small place in the sun, but he must be contented to occupy a very small place indeed and

not to put out too many claims as to his supposed rights in radio.

Secretary Hoover, in his address to the last National Radio Conference, very aptly likened radio broadcasting to the traffic on a public highway. He stated there that this traffic must be adequately handled, and that traffic rules and regulations were an absolute necessity in order to prevent traffic jams.

I apologize for repeating something here that I said there—that traffic regulations are indeed essential, but that they are made for the benefit of those who are using modern vehicles, and that no cop on a street corner is justified in holding up all traffic for the benefit of a bunch of kids on roller skates.

There are too many roller-skaters among radio broadcasters; they must be put off the streets so that the main traffic may go by without delay.



How I Earn \$100.00 a Week as a Radio Expert

A YEAR AGO I was mighty blue and discouraged. It seemed to me that I would never be more than a low-paid bank clerk. Of course, I had a small increase in salary every now and then, but I knew that pretty soon I would reach my limit and there would be no further advancement for me. What future had I to look forward to? Where would I be in five years? I became restless and discouraged and began to look around for some other opportunity.

It was then that I discovered that the demand is for trained men, that the opportunities are all for men who can do some one thing better than anything else. There were wonderful opportunities for men who were experts or specialists—but I was..... a clerk. How I regretted then that I hadn't prepared myself for some definite career!

I Wanted to Marry

The thing that made me more restless at that time than anything else was the fact that Marian and I were—that is, we wanted to be married. But we both knew that we couldn't possibly get along on my small salary. If only there was something I could do that would bring me a larger salary!

It was just about the time that everyone became so interested in radio. Our whole town became radio-mad, and, of course what was happening in our town was happening all over the country—all over the world. I managed to save up enough to buy a receiving set and I was never quite so happy as when I was trying to tune in on stations.

The thing fascinated me. Playing with air waves! Bringing melodies and messages out of the sky! I was never so interested in anything before.

Marian was the first to sense the great opportunity. "Why don't you become a radio expert?" she said. "You like it, and I am sure there must be a big demand for men who understand it. It's a new field and there's plenty of room for wide-awake men."

"But—but I'm not trained!" The thought ex-

cited me. To be a radio expert! To find my future in this fascinating new field! "I don't know anything about it, Marian," I said. "I wish I did, though."

"Well, why don't you find out about it," she retorted. "You can't learn about radio just by listening in to the concerts. Why don't you take a course?"

But we found out that most courses were expensive or that they would interfere with my other work. We were both discouraged when I discovered that through the National Radio Institute it is possible to become a radio expert by studying right at home in spare time. I told Marian about it and she was elated. "Send for me for information, at once—today!" she exclaimed.

Advances Quickly to \$100 a Week

I did, and the following day received an important booklet, "Rich Rewards in Radio," telling all about radio opportunities and how to become an expert in any particular phase of the work.

Here was my opportunity at last! I began to study in all my spare time. It was the most interesting and absorbing study I had ever made. The secret of the radio revealed to me! Day by day I became more skilled and deft until I was able to take apart receiving sets and put them together again as though I were playing with a toy. It was fun! In a month I was able to take a position as lineman at a bigger salary than I was getting at the bank. This was wonderful experience for me, and I kept right on with my studies. It wasn't long before I qualified for a position as radio engineer at a salary of \$100.00 a week! That is what I am earning now, though I expect to make more soon. It seems to me almost too good to be true, after all these years as a low-paid clerk in a bank. And Marian, who will soon be my bride, keeps saying, "I told you so!"

As a radio expert I can tell you that there is a tremendous demand for men who can build, sell and install radio sets, who can design, test,

repair. Men are needed as engineers and executives, all over the world. The opportunities are limitless, and if you like radio there is no reason why you cannot qualify for one of these positions by studying in your spare time at home as I did.

The National Radio Institute offers an absolutely complete course which prepares you for the Government First Class Commercial License and for the higher-paying jobs in Radio. The President, J. E. Smith, will be glad to send you all details of their marvelous new method of practical instruction, including information concerning the Free Employment Service which secures positions for National Radio Institute graduates. Everyone interested should have this information. It's free, and this coupon will bring it to you. I advise you to send it off today. Radio is a new and interesting field, and it offers you more money than you probably ever dreamed possible!

Mr. L. G. Elias, former Managing Editor of "Radio in the Home," is a graduate of National Radio Institute.

Important! Those who mail the coupon at once will also receive details of Special Short Time Reduced Rate. Do it now.

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I am interested in radio, and would like to find out whether or not I am suited for a radio career. Please send me, without the slightest obligation, your interesting free book called "Rich Rewards in Radio." Also full details concerning your special Short Time offer.

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STATE

Pioneer Announcer Quits

ONE of the best-known voices in the world became silent, so far as the radio audience is concerned, when Harold W. Arlin, pioneer announcer of the world and chief announcer of Westinghouse Station KDKA since its beginning, severed his connection with the station to take a position in the commercial world that has necessitated ending his residence in Pittsburgh.

Mr. Arlin remains with the Westinghouse Company, however, as he has been appointed manager of personnel for the Westinghouse Electric Products Company, at Mansfield, O., and with his removal to the Ohio city resigned his position as chief announcer for KDKA.

Mr. Arlin was connected with the Westinghouse organization when the company instituted broadcasting by establishing the world's pioneer station in 1920, and became an announcer. No one in those days had any very clear idea of the qualifications of a radio announcer, but it quickly became apparent that Mr. Arlin had qualifications that made him a valuable asset to the station.

The hold Mr. Arlin had on the radio audience was evidenced by the thousands of letters he received from every section of the United States and from nearly every civilized country in the world—friendly, personal letters from people who had never seen him, in most cases, but who wrote to him as they would to a warm and highly esteemed personal friend of long standing.

"The best-known American voice in Europe," the London Times editorially called him. Among fans in Johannesburg, South Africa; in Australia, and the British Isles, especially, his name is almost a household word and his photograph is familiar.

Marshal Foch and Lloyd George are among the international celebrities Mr. Arlin has introduced to the radio audience.

Mr. Arlin was one of the incorporators and the first vice president of the National Association Radio Announcers of America. He has made addresses before Rotary and exchange clubs in various cities, and has appeared as guest announcer from stations in Chicago, New York, Boston, Providence, Rochester, Syracuse and other cities.

One of the highlights of Mr. Arlin's radio activities was the handling of the concerts from Wanamaker's in New York and Philadelphia which were transmitted to England by the Westinghouse international short-wave relay system.

The 1926 Model "Diamond of the Air"

(Continued From Page 26)

Y. The gaps between W and X and between Y and Z are bridged by two separate short pieces of bus bar tightened under the bolt of the post. The dotted lines project those bus bar strips in the diagram. The straps are atop the socket strip. All the other wiring is beneath, which accounts for the right-to-left order.

Post X is joined to the plate post of AFT, while post Z goes to the B post. Grid of AFT connects to grid of the first AF tube (3) while the end of the secondary, marked Neg. Fil. on the instrument, goes not to negative filament but to A minus. This particular lead was established previously.

The plate of the first AF tube (3) goes to two points. They are one side of the plate resistor R3, and one side of the blocking condenser C4, which is of the bypass type. The other side of R3 goes to B plus amplifier, normally 135, while the other side of C4 connects to the open end of the leak R4, and also to grid post of the second AF socket (4).

The plate of this socket is connected to one side of R5 and to one side of C5, while the other side of R5 goes to B plus amplifier voltage and the other side of C5 to the grid of the final tube and to the open side of R6. The closed sides of R4 and R6 previously were connected, the one to minus A, the other to minus C.

The plate of the last tube (5) goes to one side of the single-circuit jack J3 and the other side of that jack goes to B plus amplifier.

List of Parts

- One antenna coupler, LoL1 (Bruno 99 RF).
- One 3-circuit interstage coupler, L2L3L4 (Bruno 99).
- Two .0005 mfd. SLF condensers, C1, C3 (Streamline).
- Two ¼-amp. ballasts, R2, R7 (Amperites, type 1-A).
- One ¾-amp. ballast, R1 (Veby).
- Two 0.1 meg. resistors, R3, R5 (Veby).
- One 1.0 meg. leak, R4 (Veby).
- One 0.5 meg. leak, R6 (Veby).
- One variable grid leak R0 (Bretwood).
- Three 4-inch molded bakelite dials (Kurz-Kasch).
- Two double-circuit jacks, J1, J2 (Preferred).
- One single-circuit jack J3 (Preferred).
- One 7x24-inch drilled and engraved panel (Cortland).
- Five standard sockets (Nald).
- One socket shelf and brackets (Bruno).

(Continued on Page 31)

Notes from the Lab at Station 3XP

This Page Is to Keep You in Touch With the New Apparatus Appearing on the Market. As Fast as the Staff at 3XP Completes Tests on Materials You Will Find the Articles Mentioned in These Columns

THE ARISTOCRAT E Z TOON GROUP CONTROL—The Kurz-Kasch Company, Dayton, O.

The photograph at first glance is merely a Formica panel with three condensers mounted on it. The horizontal bar is part of a rack and pinion which permits the three condensers to be adjusted simultaneously. The rack and pinion are of molded bakelite so as to eliminate body capacity in the dials as well as coupling between the condensers. It is possible to adjust each condenser separately by means of a vernier knob. This group control does meet the claim of the manufacturer that there is no backlash or lost motion. The condensers shown are made by the United Scientific Laboratories. Space does not permit an additional photograph to show the clever method of marking panels originated by the Veri Chrome Laboratories Company of Cincinnati. By means of this process it is possible to place dial graduations, designs and lettering on the panels of

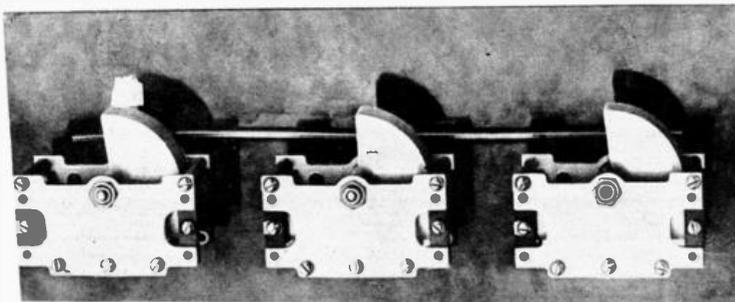


The Carborundum Stabilizing Detector Unit

sets without engraving them. When the Kurz-Kasch dials for the condensers are taken into consideration we certainly received a lot of new information on a 6x15 panel.

HOW TO BUILD LONG-DISTANCE RADIO SETS—M. B. Sleeper, 52 Vanderbilt avenue, New York City.

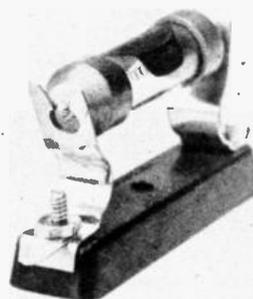
Mr. Sleeper was good enough to send us a copy of his book for review. We are glad to mention it here because Volume No. 3 has the Browning Drake in it with both four and five tubes. The five-tube hook-up uses resistance coupling and the four-tube set uses all 199 tubes. This answers a great many fans who have been writing for this information.



The Aristocrat E Z Toon Group Control

DAVEN FILAMENT BALLAST UNIT—Daven Radio Corporation, Newark, N. J.

There has been a tendency among set designers this year to place all but one or two tubes in a set on automatic current regulators. Daven has sent us samples of regulators for use on from one to five tubes. The type of unit is selected according to the number of tubes it is to carry. One of the places that we tried the ballast unit was on the intermediates in a superheterodyne. It worked very well. By mistake one of these got shorted across a battery through hooking one side to the wrong filament line. The unit got red hot, but did not burn out. One of the refreshing things about the publicity of the Daven concern is that they do not boldly claim that their units are the solution of all filament control problems. They admit that there are cases where it is distinctly advisable to use a rheostat if the control of a tube is decidedly critical. There is usually only one tube in a set that is critical in regard to filament control. This tube is usually specified in the discussion of the design of the circuit. A mounting is provided for the ballast unit of the same type as the Daven resistor mounting with which you are already familiar.

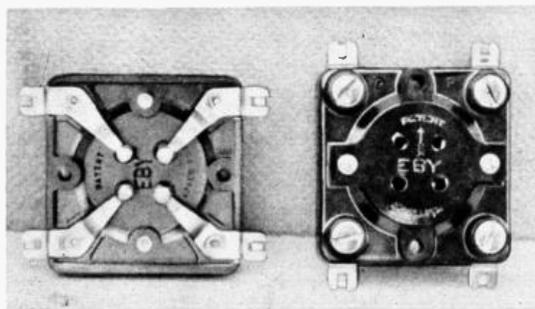


Daven Filament Ballast Unit

tubes. It is so perfectly easy to get enthusiastic over this socket that we are going to say very little about it or else our remarks will read like a paid advertisement. The grips are so designed that they give a positive contact at all times with the tube prongs and yet the spring method of suspension makes less chance of the tube giving microphonic howls. A very convenient lug is provided on the side so that the connections may be soldered directly to the prongs.

BINDING POSTS—X L Radio Laboratories, Chicago, Ill.

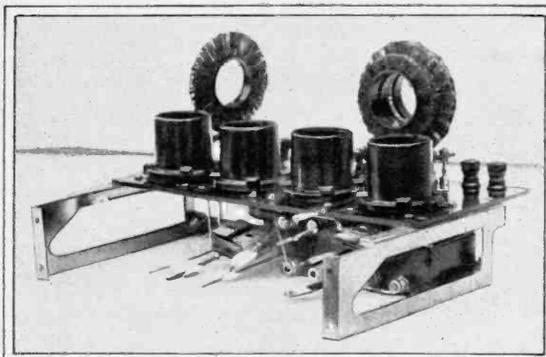
A neat little box of ten binding posts arrived at the laboratory recently. A machine screw in the base provides the means of attaching the binding post to one of the bakelite, hard rubber or Formica strips now on the market. The wires are attached to the post by pushing on the head and inserting the wire in the hole that appears. The spring inside raises the head again and gives a contact with the wire at the two edges of the post. Soldering lugs for the wires in the set and markers for the use of each post are provided.



Eby Spring Socket

EBY SPRING SOCKET—H. H. Eby Manufacturing Company, Philadelphia, Pa.

The Eby socket is designed for the new tubes, although it will hold the 201A-type



Above is the Superunit Jr. before being wired for test. Note the numbered connections for use in hooking up the unit, and to the right is the Superunit Jr. after assembly

PUP PLUG—Yaxley Manufacturing Company, Chicago, Ill.

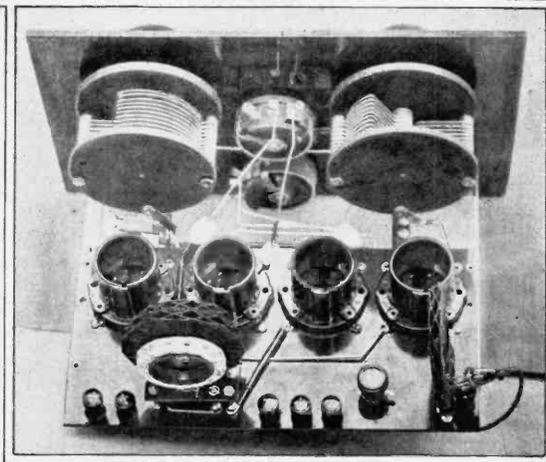
A very welcome shipment of "pup plugs" was received at 3XP. Although these plugs are intended for use with the "pup jack," we find them particularly valuable for use on the end of flexible wires instead of phonecord tips for making connections to binding posts. For the first time in the history of 3XP we have had enough flexible wire with tips on it to do what we started out to do. Usually the wires have had a tip at one end and none at the other, or else we have had to wait for the soldering iron to heat so that we could solder a tip on the wire. Now all that we have to do is slip the wire through the plug, screw up the cap, and we are all set.

PANELS AND TUBING, FORMICA—Formica Insulation Company, Cincinnati, O.

If we "FORMICA" you to death in the next few issues you can blame it all on a shipment of stock that this company sent us. We have used this material before and have been more than pleased with it. The cause of all the enthusiasm is the new finishes that Formica is using. In addition to the now familiar mahogany and black, the material may be obtained in straight grained walnut, burl walnut and mat finish so that it is possible more closely to match your panel and cabinet material.

THE CARBORUNDUM STABILIZING DETECTOR UNIT—The Carborundum Company, Niagara Falls, N. Y.

The neat unit consisting of a carborundum fixed detector, potentiometer and battery is shown in the photograph. It should be



of particular interest to owners of reflex sets using a crystal detector. If you have a reflex that has been giving you trouble, it might be worth your while to try one of these units, particularly in the old Harkness reflex, as the potentiometer gives you a control of the crystal detector not available with the ordinary fixed crystal. The unit has the single-hole mounting which makes installation simple.

SUPERUNIT JR.—Hanscom Radio Devices, Woonsocket, R. I.

With the Superunit Jr. there are eleven connections to make and you have a complete set. No baseboard is needed, as the instruments are mounted on a sub-base with brackets for attaching the unit to a panel. To complete the unit, two .0005 mfd. variable condensers, two dials, two rheostats, one double-circuit jack and one single-circuit jack are needed. The volume from this simple set is remarkable. The tone quality is decidedly good. Complete directions for assembly come with the unit, making the final assembly an easy job. Even the veriest novice should have no difficulty with it.

Taking the Bother Out of Batteries

(Continued From Page 29)

the third from detector B to high voltage, or amplifier, B.

And finally, invest in a really good voltmeter. Get one with a double scale—one scale going from zero to six or eight or even ten volts and enabling you to read fractions or decimals of a volt—and the other scale reading up to 100 or 150 volts.

Later we will tell you how to use such a voltmeter to test parts of apparatus and also to locate trouble in your set. For

the purposes of this article, however, the voltmeter is used to indicate the condition of your "B" batteries. "B" batteries are useless when a 22½-volt block drops to 17 volts or a 45-volt block drops to 34. Never test "B" batteries with an ammeter. Use a voltmeter; and, when you buy a voltmeter, get a good one with high resistance and pay a good price for it without grumbling. It's worth it.

The 1926 Model "Diamond of the Air"

(Continued From Page 28)

Two 0.25 mfd. fixed condensers, C4, C5 (Aerovox).
One 5-strand multi-colored battery cable (De Luxe).
Two battery switches, S1, S2.
One .00025 mfd. fixed grid condenser, C2.
Six single mounts.
Four bindery posts, W, X, Y, Z.
Five battery cable markers.
Ten lengths of bus bar (Cornish).
Two flexible leads for C battery.
Screws, nuts, spaghetti.

CARTER New "IMP" Loop



Again Carter leads with a loop that is compact, sturdy, yet highly efficient. No possibility of loose wires breaking. Weighs one pound, diameter 16 inches. Tapes are provided for all loop circuits.

See one at your dealers. Write for illustrated folder.

In Canada—Carter Radio Co., Limited, Toronto

Carter Radio Co.



The New EBV Spring Socket is a Positive Contact on a Shock-Absorbing Base

Don't take a chance on twenty loose connections in a five-tube set. Whether you build or buy, insist upon EBV Spring Sockets.

H. H. EBY Mfg. Co. 4710 STENTON AVE. Philadelphia

"—results are truly amazing!"

NATIONAL Browning-Drake Transformer

A tuned radio-frequency transformer of highest efficiency. When used with a Browning-Drake receiver, the results are truly amazing. Write for Bulletin 106 N.H.

NATIONAL COMPANY, Inc.
W. A. Ready, President
110 Brookline St., Cambridge, Mass.

SAFETY DEMANDS



BRACH

**VACUUM
ARRESTERS**

FOR YOUR RADIO

The test of time has proven them of unquestioned value. Give them a maximum protection at moderate cost.

L. S. BRACH MFG. CO.
NEWARK, N. J.

EVERYTHING IN RADIO AT BARGAIN PRICES

Just hot off the press—big Radio Catalog & Guide bristling with latest ideas, over 100 newest book-ups with illustrations—all free. Shows extras as high as 50% on standard guaranteed radio parts, sets, kits. Be sure to get this thrifty look before you buy. It will save you money in your pocket. Unusual! You'll say so when you get it. Also please send name of radio friend. Write today!

THE BARAWIK COMPANY
104-130 E. Canal St. Chicago, U.S.A.

POWEL CROSLLEY JR.



INDUSTRIALIST *Pioneer Radio Builder*

At a time when products of his manufacturing genius were already known to millions, Powel Crosley, Jr., boldly diverted his energies to the development of radio reception, then scarcely known beyond the laboratory walls.

Pioneering both in engineering trends and manufacturing practice, Mr. Crosley has been a vital factor in making radio and broadcasting as much a part of American life as motion pictures and the motor car.

There is scarcely a milestone in the development of popular radio on which his shadow has not been the first to fall. And his announcement of December 26th concerned a milestone that dwarfed all others in its importance—four entirely new radio receiving sets:

- The Crosley 4-29 (4-tube) \$29.00
- The Crosley 5-38 (5-tube) 38.00
- The Crosley R. F. L.-60 (5-tube) 60.00
- The Crosley R. F. L.-75 (5-tube) 75.00

*These are now being demonstrated by
Crosley dealers and will be completely
described in a forthcoming issue.*

The ORIGINAL RADIO "SANDMAN"

By Eugene Konecky



Val McLaughlin, the original "Sandman," of Station WOC, who is now with Station WOAW

"AND so the handsome Prince rescued the beautiful Princess and they were married and lived happily ever after." Then comes a soothing lullaby and thousands of listening kiddies prepare for the Land of Nod at the behest and inspiration of the original radio "Sandman," Val McLaughlin, now at Radiophone WOAW, owned and operated by the Woodmen of the World Life Insurance Association at its headquarters in Omaha, Neb.

For many years the beautiful voice of the original radio "Sandman" was known to juvenile and adult radio listeners from the well-known Davenport WOC, where she met "her handsome Prince" and Cupid shot the barbed arrow of love-at-first-sight, which sent the beautiful Princess on her happy honeymoon. But the beautiful Princess could not forget her former role as the "Sandman" and she longed to impart to the thousands of kiddies, who she had once thrilled and entertained, the wonderful stories which she had whispered through the microphone into their attentive ears for so many years and so, she came back to radio and is now affiliated with WOAW in her former role.

Val McLaughlin is known as "the voice of a thousand smiles" and also "the best known woman's voice in America." This is not merely the consensus of opinion of her large radio audience, but the judgment of radio experts who have carefully tested her voice. Her popularity and the magic of her laughing voice combine to win for her the honor of becoming an exclusive Brunswick record artist and she records her "Sandman" stories and children's version of bible stories.

Miss McLaughlin's specialty is the entertainment of children, but this is by no means the field to which she is

confined. Among the thousands of letters which she has received from her radio listeners, a great portion are from grateful adults who enjoy her work. She is also a capable dramatic artist, and has successfully given interpretations of the leading roles in such plays as "Ten Nights in a Barroom" and Sudermann's great drama "Magda." In addition to her radio "Sandman" stories, she is in constant demand for public entertainment of children at band concerts in parks; schoolchildren's parties; Sunday schools and private parties. She is also very prominent in amateur theatricals under the auspices of leading civic organizations. In fact, it is impossible for her to comply with full demands for her services.

Miss McLaughlin is a fitting illustration of the old adage, "One cannot become an artist; one must be an artist from the first." Since the time when she was 4 years old she has done public entertaining. On that first occasion she gave the prelude at a church Christmas exercise, and since that she has launched upon the sea of professional entertainment with gratifying success.

She commenced her dramatic training at Dubuque, Ia., Mount St. Joseph College from where she was graduated and of which she is at present the First Vice President of the Alumni Association. For several years she studied dramatic art at the Columbia College of Expression in Chicago from which she is also a graduate.

Then followed several seasons on Chautauqua and Lyceum Circuits in which she traveled from "post to post" building up a reputation as a recognized entertainer by the sheer power of

her personality and talent. She was formerly associated with the John B. Rogers Production Company, of Fostoria, O., a pioneer amateur theatrical organization, and from this experience she derived a great deal of valuable knowledge in relation to public entertainment. In 1922 she created the character of the original radio "Sandman" and became associated with Radiophone WOC at Davenport.

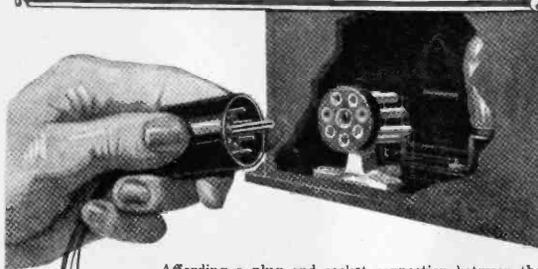
Like many others, Val McLaughlin entered the radio field at a time when its possibilities were undreamed of. She first offered her radio "Sandman" stories incidental to her other duties as a public entertainer, but soon the demand for her services became so great that in a short time she was devoting her entire time to the "Sandman" work. In evidence of her immense popularity, we refer to the popularity contest held in Davenport, Ia., in 1923, under the auspices of the American Legion. She was awarded the popular prize of a diamond ring.

Many other gifts have been received by her as a direct evidence of the appreciation which her audience holds for her unique and inspiring entertainment. She has received as many as twenty-two boxes of candy in one week.

She understands children—their joys and their sorrows, their likes and their dislikes. She has the imagination to penetrate into the child's mind, and she knows that the most attractive element in anything for a child is the element of surprise, and all her stories are full of surprises.

Her voice is not only the "voice of smiles," but of tears; of sudden joy; of depression; of giddy happiness or fear. In fact, she is capable of expressing the gamut of human emotions and conveying it to her listeners just by the mere intonation of her voice. In that respect she is a supreme artist. Stacks of mail which are pouring into the studio of WOAW testify to the continuation of her popularity with her old friends and with the thousands of new friends which she is making from "the voice of the Woodmen of the World."





Affording a plug and socket connection between the radio set and all outside connections, Jones Multi-Plug is as essential to the radio as a cord and socket to the electric iron. For safety and convenience leading set manufacturers have adopted this item as standard equipment. You, too, need a Multi-Plug for the set you are building or the set you now have. See your dealer or write direct for descriptive folder B.

TYPE BM—For Set Building \$4.50
 TYPE BP—Adaptable to Any Set 5.00

HOWARD B. JONES CHICAGO, ILL.
 614-18 S. CANAL ST.



Jones MULTI-PLUG

THE STANDARD SET CONNECTOR

Two Good "Signal" Loops Take Your Choice

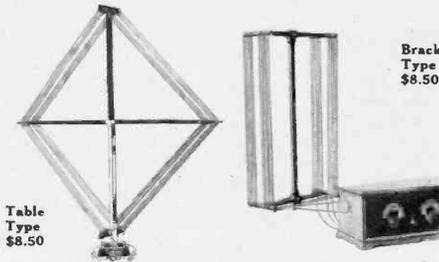


Table Type \$8.50

Bracket Type \$8.50

A bracket type that attaches right onto the end of your radio cabinet or a table type—you can't miss it in either one. When you buy a Signal Loop you're buying more than just good looks. You're buying an aerial backed by thirty years of experience in the manufacturing of electrical equipment.

Where quarters are close, remember the bracket type loop attaches right onto the end of your set and does away with that "extra piece of apparatus." It turns a complete 360° in the width of the standard cabinet.

Both aerials are beautifully constructed. The bracket type is of solid walnut. The table type is mahogany finished. All metal parts are heavily nickel plated. A third tap is provided for sets requiring it. Ask your favorite dealer to show you the Signal Loops—either type \$8.50. You will surely want one.

JOBBERS & DEALERS:—If you are not fully acquainted with Signal Radio Products, we will be pleased to send you complete information. Write us at once for literature.

SIGNAL ELECTRIC MANUFACTURING CO.
 Dept. 11-A Menominee, Mich.

Branches in All Principal Cities

TONE

Full, sweet, mellow and natural, without the slightest indication of distortion, is another achievement that is making the APEX SUPER FIVE the most popular of all receiving sets.

VOLUME

That supplies dance music or entertainment without any loss, is a feature for which the APEX SUPER FIVE is world famed.

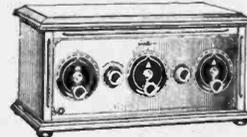
DISTANCE

Lends added enjoyment to radio with an indescribable fascination of tuning-in far away stations, which is always possible with the APEX SUPER FIVE.

Ask your dealer for a demonstration. Your eyes and your ears will tell you that APEX stands at the high point of perfection in both performance and appearance. \$89 without accessories.



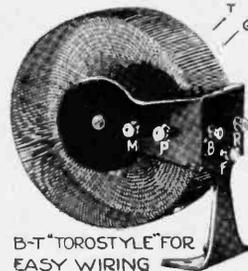
**SUPER
5**



APEX ELECTRIC MANUFACTURING CO.
 1410 W. 59th St. Dept. 112 CHICAGO

B-T Counterphase and Nameless Circuits Continue to Make Unequaled Records

Read what they say—



B-T "TOROSTYLE" FOR EASY WIRING

Kansas City.
 The Counterphase is in every particular by far the most efficient receiving set that I have owned or heard in operation. One stage of audio is quite sufficient for ample loud speaker reception in five rooms of all class B stations in the U. S., and many class A.

Chicago.
 November 9th outside of the usual run of distant stations the following were picked up from Chicago Heights: Miami Beach, New Orleans, New York, Denver, Springfield, and FOUR DIFFERENT STATIONS IN CALIFORNIA.

Cincinnati.
 Summarizing tests on Counterphase Set I can safely say it has more volume, greater selectivity, greater sensitivity and produces higher quality of reproduction than any receiving set I have ever heard.

Torostyle Transformers in three styles: TA Antenna Coupler, TC Intermediate, T4 for one-stage radio, each \$4.00.

Kit No. 5 for the patented 5-tube Counterphase, \$28.50.
 Kit No. 6 for the 6-tube Counterphase, \$38.00.

The Counterphase 9-color wiring diagrams have never been approached in radio. They leave no room for error.

Have You Read "Better Tuning"?
 80 pages, postpaid 10c

BREMER-TULLY MFG. CO.

532 S. Canal St., Chicago

Pretty soon more women remarked about programs, and now and then we found a real fan, some who had actual experience in "sending" in a small way, and could tune a set so as to get good reception. Then they truly began to be interested and expressed opinions regarding what they liked and what they didn't like. All this time they were still thinking of it as a man's pastime and plaything.

Concerts were usually of one or two hours' duration, as then all stations were on 360 meters and there was a gentleman's agreement regarding the amount of time each should have. One heard songs, an instrumental number, more songs and another instrumental number with a great deal of "just a minute please" that helped fill the evening. Once in a great while a really good speaker appeared.

Then came the church services, and then came the deluge of letters and they were glorious. Shut-ins who had been for years deprived of such things, hospitals, jails and even homes where church-going was not a part of the Sunday routine wrote. People sent in money and checks, and the following Sunday hundreds went to see the church and the rector and hear the music first-hand. That was a phase of broadcasting that meant much and by many was the least appreciated for some time. There was no creed or race in this air church service. After it left the church, it brought every kind together, most of them to their own several denominations.

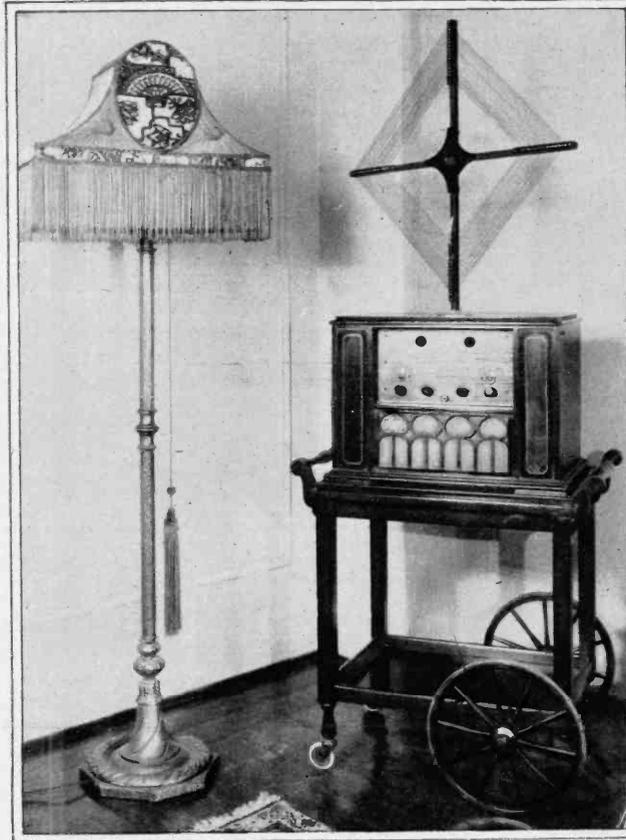
Then the one big thing in that year was grand opera, and I have the most sincere respect and admiration for the director who made that possible. But the funny part as I now think of it was the fact that they installed several loud-speakers in the big restaurant and invited a most skeptical press to be among those present and secure a first-hand impression. Many of the press responded, looked utterly bored and left early to write their closing impressions. And again the man who was interested in opera for that city hoped they would have some letters on the opera so they could be guided in the future about the same thing.

Now that man directed that the letters be put on his desk. They were, and when he arrived at his office he couldn't find the desk, as there were mail sacks galore and tumbling around everywhere were letters, and he said no more regarding mail, but a second opera followed the first and so on.

Hundreds and hundreds of persons who had failed to respond to opera for a long time purchased tickets; many who had thought grand opera a pastime of the rich

and the learned went, and the response was immense. The opera owners were not over-impressed, as they are supposed never to be, and again they were guaranteed so much before they opened, but those who were instrumental in bringing opera there and who had on several occasions made up the deficit were impressed, as there is nothing that talks better than the box office receipts.

Prior to the opera opening, the advertising manager secured a batik exhibit.



And Madame enters the radio factory also—not in person, but her influence as a buyer is shown by such tea-wagon installations as this one

There were lovely batiks displayed and just how to do the thing was most ably shown by bobbed-haired maidens imported direct from Greenwich Village. Cigarettes and smocks and atmosphere galore surrounded them. For some reason the advertising didn't hit and so they decided to try radio, and I was lugged into the scene.

Now, I loved the art and expressed it in my best way. The talk "went over," for soon came men and women saying they had heard about it through the radio.

So we tried other things and at Christmas time we told the world what to buy and whom to give it to and all sorts of information regarding the proper Christ-

mas spirit. If there were any that year who failed to get what they wanted, it was no fault of ours. We approached the talks each morning with the kindly help of a phonograph record fitted to the season. And at intervals we used many such talks, and at Easter again repeated the gift habit and lots of good cheer was thrown in with more records of the right kind. As the talks were of more or less appeal to women, we had the greatest response from women,

and I had offered my personal help in their gift selection so I was able to sense that they liked their own part in the program.

Some time before the talks were put on, the announcer who had the noon program failed to show up. The operator, with the transmitter all ready, buzzed to go ahead and there was no one to go. I rushed to the elevators and no one appeared and I didn't know how to reach the operator without going to the eighth floor, so I put a music roll on the player-piano and started it, pushing every switch in sight and, lo and behold, it went on the air.

After two attempts like that and with the operator still buzzing, I announced to the world what was going on. Imagine the operator's surprise to hear me in place of the bass of the usual announcer. Well, it got out and I was rather well pleased until some one telephoned the boss to take that squeaky man off the air. You see, women had not announced up to that time. Well, it hurt, but that is a mere nothing to what I have since heard said about women announcers.

All this time we were receiving more mail from women—good, kindly letters asking for features and giving genuinely constructive criticisms, and we really began in a small way to cater to them, and

I was more than passably interested, as I had put on several holiday seasons and wanted the reaction of them. It had been hard to get a real expression from them regarding what they wanted as a regular feature, but they did want something and began more and more to say so.

Mail in the meantime was most interesting, and one real funny letter that came from a man but concerned his wife read in part like this: "Dear Radio Folks—We, my wife and I, have been married twenty-six years. She is a good wife and I have been a home-loving man. But she had a bad habit of nagging, especially as I liked to be comfortable when I go home, and it was 'don't do this' and 'don't do that' until I belonged with the don'ts. You more than likely kept me from murder and this is how it happened. One of my neighbors asked me to take his radio set and use it, as he was

By Jean Sargent

And MADAME ENTERS

JUST a matter of a few years ago radio, while an accepted fact, was not known to any but a few enthusiasts, and they were the type that loved all sorts of soldering irons, ohms and condensers. They talked Morse, they lived in a state of picking up and they were what is now known as "hams."

Scarcely was there a woman who had any definite knowledge of what it was all about. She knew that the men folks in her family had a machine, many times covered with a cloth, that must not be disturbed. Why, one was not even allowed to dust near that contraption! Usually there was a key, and also the nastiest kind of batteries that more than likely leaked and ate holes in the floor covering. Of course, if the home contained an attic, then the whole proceeding moved there, much to the housewife's relief.

All that has changed and is still more changing. A radio set is now a part of the needed articles in the home, just as the vacuum sweeper, the food chopper and what not that is intelligent in its uses. And nowhere is there a more intelligent article of furniture than a radio set. One can have just as simple or as elaborate a set as means and taste afford. Period furniture can be matched, artistic design in receiver and table or console is achieved through study, and the radio of today is harmonious in every respect. In fact, the recent radio shows stressed beauty of construction in the cabinet and the equipment, such as loud-speaker and container for receiver and batteries, as much as they did points of quality.

So the man of a few years back has sacrificed nothing. In fact, he is much the gainer, as who knows that when listening for China the atmosphere surrounding the Chinese Chippendale cabinet housing his favorite make of receiver may bring China still clearer to him?

It was my good fortune to be associated with one of the earlier stations, when broadcast was an infant. At that time I was in charge of a direct-mail department of a store that sensed the value of radio publicity, perhaps chiefly because one of the men active in the store interests had a longer vision than many others, and he, so to speak, grabbed off a good thing when it was young and trained it.

Before the station was put in operation, and when the radio department



Jean Sargent, women's program director of Station WHT

JEAN SARGENT is a pioneer—in fact, is "the" pioneer—in putting on radio programs especially for women. There is probably no one in America—and that means the world—who is more closely in touch with the sentiments of women listeners-in toward radio in the home. We, of "Radio in the Home," have been in close touch with her ever since the early days of which she writes so entertainingly in this article and we are glad that she has at last found time to write for us a series of articles telling of her work and of the things that women demand on their radio programs.

Miss Sargent started with Station W'N'AC in Boston. She is now in charge of women's features for Station WHT in Chicago and she has formed a most remarkable radio women's club from the latter station. Several thousand women have registered as members of this club and they have told her just what they want from their radio sets. In these articles for us, Miss Sargent will tell you something about these demands.

H. M. N.

was just a few counters and mighty little else, I was given certain correspondence to handle regarding radio material. Now writing .0005 seemed a mistake to me, but at that time I just went ahead and got out the stuff with no idea of what it was all about.

Then when the station went into active operation, I also handled all the mail, and my duties were to answer each letter or card with an acknowledgment, and if the letter we had received contained a direct inquiry I had to answer that. Of course, that meant many talks with the engineer and gradually a slight knowledge of what I was writing about.

About 99 per cent of the mail was from men. Nearly every letter had a very strange drawing, called a hook-up. At first I rather thought the writers were a most untidy lot, had spilled the ink and let a fly track through it and never troubled to throw it out. But as each writer assured us that the hook-up was the best he had used and he was at radio from its birth, and moreover we could use that hook-up with his permission, I naturally thought I ought to consult with the boss, as we called him, regarding their value.

Now right there I learned what he knew about radio. It was what I knew, except that he owned a set and had seen several kinds and even one or more stations in operation, and when I questioned him regarding the drawings, he gave a most wise look, and said, "Better file them for reference." I did, and I guess they are still to be had if ever needed.

Then on top of that the news leaked out that the antenna had a lot to do with the reception from a station, so after a bit of information along that line by our engineer the public began to send in for information and those letters were accompanied by a great and weird drawing of a Queen Anne front and Mary Ann back type of house with poles and wires suspended therefrom, and how high should it be and East or West was to be settled. That was a trying period, especially when the stenographic force got a drawing mixed and sent the wrong measurements, and then we had an irate listener who advised us, just as now, that we had a punk operator and a few other choice but well-chosen statements.

Now and then came a letter from a woman—mostly, however, from some one who had a man in the family—writing to thank us for a concert.



Frederick G. Rodgers, who has gained unusual popularity as a radio announcer at Station KDKA. He is also a singer and appears before the microphone from time to time

native Croatian airs and other melodies, with the excellent transmission of this type of instrument, made a hit from the first program.

One of the KDKA vocal soloists has achieved the paradoxical distinction of retiring as a singer and later multiplying her audience many times, so that it includes people in parts of the world where she never before had been heard, although she has an international reputation as a concert singer. This singer is Christine Miller (Clemson), famous Pittsburgh contralto, who retired after her marriage and since has been heard only over KDKA, except for appearances at benefit concerts. Her new audience includes every part of the English-speaking world, in addition to every country of Europe, as practically every spot in the globe where radio receivers are generally operated is being regularly reached by the station's international

Miss Mabel King, Contralto, who appears on KDKA's program occasionally



short-wave relay system. Richard Kountz appears at KDKA in the double role of pianist and composer. One of the younger of American composers, he has become a sort of "radio composer," as several of his songs have been heard for the first time over KDKA, and one of them was named by the station's audience. "Sleepy Hollow Tune," perhaps the most popular classical song produced in the last several years, was heard first over the station, and sixteen thousand of the station's listeners submitted names for another Kountz composition, the name chosen being "When the Dawn Breaks Through."

Mr. Kountz also is a native Pittsburgher. His compositions include songs, choruses and instrumental works. He frequently plays the piano during presentation of his compositions. He now is working on a radio opera.

Miss Irma Carpenter, one of the KDKA



Richard Kountz, composer and pianist of Station KDKA

soprano soloists, and Chaunsey Parsons, tenor, had singing over the radio thrust upon them. They were soloists at the Shadyside Presbyterian Church in Pittsburgh, and when the pastor, Dr. Hugh Thompson Kerr, began putting his Sunday evening vesper services on the air, their singing was broadcast as a matter of course. So kindly did the radio audience take to their voices that they have continued to sing regularly from the station, frequently appearing as soloists or members of an ensemble during the evening musical programs.

J. Lloyd Mahony, baritone, became interested in singing over the radio through the University of Pittsburgh studio. Mr. Mahony is a member of the faculty at the



Raymond Griffin, Bass, who appears on KDKA's program from time to time

University of Pittsburgh, coming to the city from New York, where he studied with Jerome Hays.

Another baritone who has been a favorite with the KDKA audience added a new role and was the anonymous announcer for the KDKA commercial concerts, whose identity baffled listeners-in for several months. Although no reference was made by the station to the fact that a new announcer was on duty, people at once began writing to the station asking if the new voice was not that of various well-known announcers they had heard from other American stations.

Although the listeners did not recognize the voice, they had been hearing it regularly in previous concerts, for the new announcer was the baritone, Frederick W. Rodgers, who had been singing from the station.

Emma Bauman Lewis, soprano, well known in concert and oratorio before broadcasting was inaugurated, is said by many of the radio listeners to possess an

(Continued on Page 28)

C. W. Horn, Superintendent of Radio Operations at Westinghouse Electric & Manufacturing Co.





Victor Saudek, Musical Director of Station KDKA

a Pittsburgh steel mill when he became interested in the KDKA Little Symphony Orchestra. He had studied the cello while at the University of Sofia, and when it was learned that he had a degree in science, he joined the research department of the company, doing work along chemical lines, and has been playing in the orchestra.

One of the members who developed into a skilled musician after the orchestra was organized was Leo Kruczek, who after playing for a time with the Little Symphony, at 17 years of age, went to the violin section of the Minneapolis Symphony Orchestra. He now is playing with the Little Symphony after a season with the Minneapolis organization, and is teaching violin in Pittsburgh.

One of the original members of the orchestra was R. R. Baker, an engineer, who had been a member of the company's general engineering department when the



B. Dare Fleck, Program Director of Station KDKA

Pittsburgh orchestra and conductor of the Royal Opera of Berlin. He is a member of the faculty of the school of music, Carnegie Institute of Technology, and during the war was instructor of army bandmasters.

When Mr. Saudek organized the orchestra in 1912, he found several Westinghouse men who had conservatory training and had played in noted orchestras and bands in America and Europe. Later musicians were attracted to the orchestra and through it became identified with the Westinghouse Company, while in a case or two, musicians have been developed in the families of Westinghouse employes and have joined the orchestra.

One of the musicians attracted to the orchestra after it went on the air is Natcho Vasileff, a native of Bulgaria, who came to America after the World War. Although a graduate in science of the University of Sofia, he had been unable to find in the strange land a position to which his training fitted him, and was doing manual labor in



Sousa's band, the St. Louis orchestra and of the Chicago Grand Opera.

Mr. Saudek also conducts the Westinghouse Symphony Orchestra which broadcasts Sunday afternoons, and is organizing an employes' orchestra of 100 pieces.

These organizations by no means complete the roll of Westinghouse musical groups that are popular with the great radio audience, for the Westinghouse community chorus, a mixed chorus of sixty voices under the direction of Alfred Bartletti, broadcasts programs, as does the Croatian Tamboritzza Orchestra.

The tamboritzza orchestra gave its first program only this year, but the demand on the part of the radio audience for repeat programs has made it a regular feature of the programs. The tamboritzza is a native Croatian instrument, shaped like a heart and of various sizes and played somewhat like a mandolin. The members of the orchestra had been playing together for several years, and their

H. W. Arlin, Pioneer Announcer of Westinghouse Station, KDKA, Pittsburgh. He has resigned



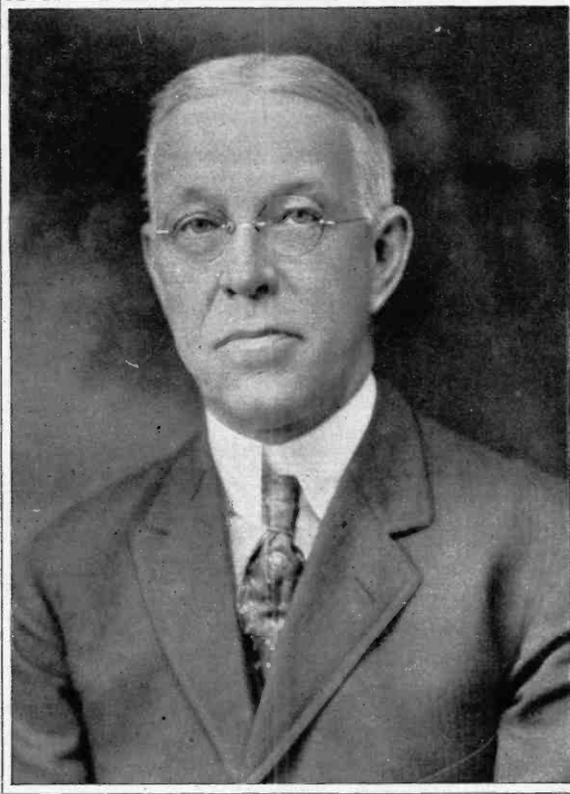
J. C. McQuiston, Manager of the Publicity Department and Director of Westinghouse Radio Broadcasting

company took up broadcasting. His father was a professional musician, once a member of the Cincinnati Symphony Orchestra. The son had been trained as a musician from youth, and might have been expected, as a matter of course, to follow the bent of his early training and become a professional musician as his father was. He chose, however, to become an electrical engineer, and after completing his engineering course at the University of Michigan came to the Westinghouse Company, where he was located when the Little Symphony was organized.

The regular orchestra personnel is supplemented from time to time by players who have been with organizations like

Dr. Charles Heimroth, Organist of Carnegie Music Hall, Station KDKA





Station KDKA

By W. W. Rodgers

T. J. Vastine is conductor of the band, which plays a wide variety of classical and other selections adapted for use by concert bands.

Another KDKA organization was organized for the express purpose of being put on the air. This was the KDKA Little Symphony Orchestra.

In an average group made up of more than 100,000 residents of large American cities, there probably will be found a surprisingly large number of people who are amply qualified, by ability and training, to earn a good livelihood as professional musicians, but who find other forms of life work more attractive to them for various reasons. And while they do not choose to spend their entire time in concert or orchestral work, they nevertheless welcome an opportunity to play with a high-grade musical organization.

It is such players who make up the KDKA Little Symphony Orchestra. They were picked from among the 35,000 Westinghouse employes or their families.

Victor Saudek, musical director for the Westinghouse stations, conducts the orchestra. Although he still is a young man, he has had a long experience in orchestral and other musical work, having played in orchestras since he was 15. He received his musical training in America, and played in orchestras directed by such famous conductors as Mascagni, composer of "Cavalleria Rusticana"; Richard Strauss, Victor Herbert and Emil Paur, director of the old

THIS is a story of how various individuals, organizations and institutions were asked to go on the air from Westinghouse Station KDKA, consented, and because they found the experience of taking the air greatly multiplied their usefulness and happiness, have continued to take the air more or less regularly ever since.

One of the first of these "individuals, organizations and institutions" to take the air was the Westinghouse Employes' Band. This organization, made up of people employed by the Westinghouse Electric & Manufacturing Company at its main works and general offices in East Pittsburgh, was giving concerts long before the company established Station KDKA, the world's pioneer broadcasting station. When the early program makers were casting about for program-making material, the band was one of the first things that popped into their minds, and accordingly it was asked to give a program. The program makers, band and radio audience were well pleased, and giving a program weekly became a habit with the band.

The Westinghouse band and the station are almost synonymous terms among listeners in Europe, Australia and South Africa, for letters to the station show that the people who regularly listen to it abroad hear the Saturday night programs more often than those of other nights. This

is because people in these countries, to hear a program broadcast at from 8 to 10 o'clock in the evening in Pittsburgh, must listen in at 1 to 3 o'clock in the morning of the following day, and even later, due to the difference in time. Those who must stay up until the break of day to hear a program from across the sea prefer to do it on Sunday morning, as they have a chance to catch up on sleep during the day.



To the right is the KDKA Little Symphony Orchestra under the direction of Victor Saudek

WHAT CAN I GET?

ARE you new in this radio game? Have you just bought your set and installed it? What did you expect to get out of the set once you had it?

Most folks are led into radio by a combination of urges—among which might be mentioned hearing some one else's receiver, listening to conversation among those already having sets, reading articles and advertisements in publications or viewing dealers' windows.

Some folks hope for education extension, but I believe most of us want entertainment—novelty—thrills—surprises. And although many claim to feel entirely satisfied to receive nearby stations altogether, few there are who do not some time experience the impulse to reach out beyond their own sphere of acquaintance. Even to hear the bare call letters from some far-off city tickles one's fancy, especially if there's a friend around to hear it too. It is not so much the actual enjoyment of long-distance receiving, but the mere potentiality of the thing.

I know a man who cared little about really tuning for weak stations, but who wanted to know and be able to tell his friends that he could hear St. Louis, Cuba, and so on, with his machine. The salesman had to go to this man's home and let him hear the announcements from three or four "DX" stations before he felt assured. And I doubt whether he ever bothered to get them again. He'd say, "Sure, this set will bring in anything this side of the Rockies, but what's the use? The best entertainment comes right from New York anyway!"

But to others the "itch for distance" is more compelling. We want to listen to the local stations for our chief entertainment, but we do wish at times to set our dials for some unfamiliar station.

Now it is impossible for any one to predict just what one can get with any given radio set, regardless of its supposed sensitivity. "Coast-to-coast reception on a loud-speaker" cannot truthfully be claimed for ANY type of equipment unless we know



in addition certain other facts upon which the receiving power of a set depends. The chief factors controlling this receiver power are:

1. Location (in relation to cities, buildings, etc.).
2. Installation (aerial, tubes, batteries, etc.).
3. Type of set (sensitivity and selectivity).
4. Skill of operation (time and dial settings for listening).

In a consideration of these factors it is not possible to state which is uppermost. Indeed, a skilled operator will often take

By Brainard Foote

We want to hear a voice from a thousand miles away announce the "Gold Metal Station, Minneapolis-St. Paul" or in those melodious Spanish tones give the call as PWX, Havana

the simplest sort of one-tube outfit and "log" or list sixty stations in an evening, whereas an unskilled operator may have a superheterodyne or five-tube receiver and get only two or three stations that are not classed as "locals" in the same night. Then again, the same man might use the same set erected in different locations and installed more or less efficiently and get widely varying results.

Therefore, we must think of all these things when we use the receiver. Seldom can we have everything perfect. The country lad, with ideal conditions so far as location is concerned, may not be able to afford the most sensitive outfit, while the city man with means can have a very sensitive receiver, but may have to get along with only an indoor aerial. However, it does surely pay to make all such conditions governing reception as favorable as possible. Of course, if you care nothing for distance reception, the requirements for good local results are far less rigid. But just now we are thinking of those who do care about longer range—and few of us don't!

This factor, of course, is usually beyond our control. The set goes where we happen to dwell, naturally. But it may be well to know what to expect. In cities, especially close to big steel buildings, bridges, powerhouses, gas tanks and other metallic structures, the radio set is at a disadvantage. Iron and steel structures

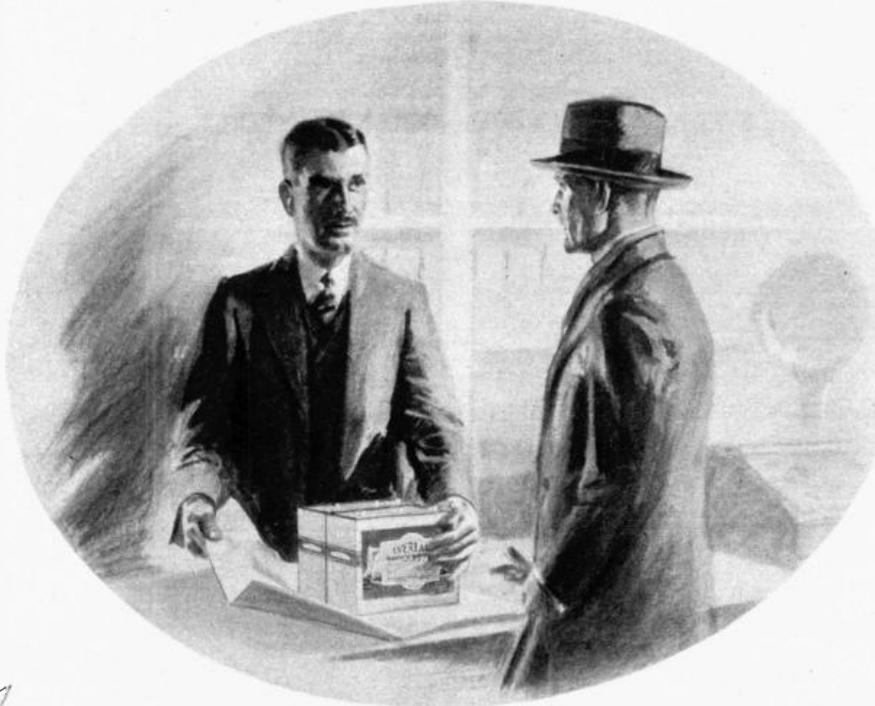
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These Eveready Batteries are the correct size for your set. With average use they will last you a year or longer

"You have been one of the many who use 'B' batteries that are too small in capacity for their receivers. That is not economical. It makes you buy 'B' batteries twice as often as necessary. Fit the right size Evereadys to your set and add a 'C' battery,* if you haven't one, and you'll get maximum service at minimum cost."

The life of your Eveready "B" Battery depends on its capacity in relation to your set and how much you listen in. We know, through careful investigation, that the average year-round use of a set is two hours a day. Taking that average we have proved over and over that on sets of one to three tubes the No. 772 Eveready "B" Battery used with a "C" battery will last a year or

longer. On sets of four and five tubes, the larger heavy duty Eveready Batteries used with a "C" battery will last eight months or more.

Here is the secret of "B" battery satisfaction and economy:



Left - Eveready Layerbilt "B" Battery No. 486, 45 volts, for maximum economy on low, five or more tubes.



Right - Eveready Dry Cell Radio "A" Battery, 1 1/2 volts. The battery built especially for dry cell tubes.

EVEREADY

Radio Batteries

—they last longer

*NOTE: In addition to the increased life which an Eveready "C" Battery gives to your "B" batteries, it will add a quality of reception unobtainable without it.

With sets of from 1 to 3 tubes, use Eveready No. 772.

With sets of 4 or more tubes, use either of the heavy duty batteries, No. 770 or the even longer-lived Eveready Layerbilt No. 486.

We have prepared for your individual use a new booklet, "Choosing and Using the Right Radio Batteries," which we will be glad to send you upon request. This booklet also tells about the proper battery equipment for use with the new power tubes.

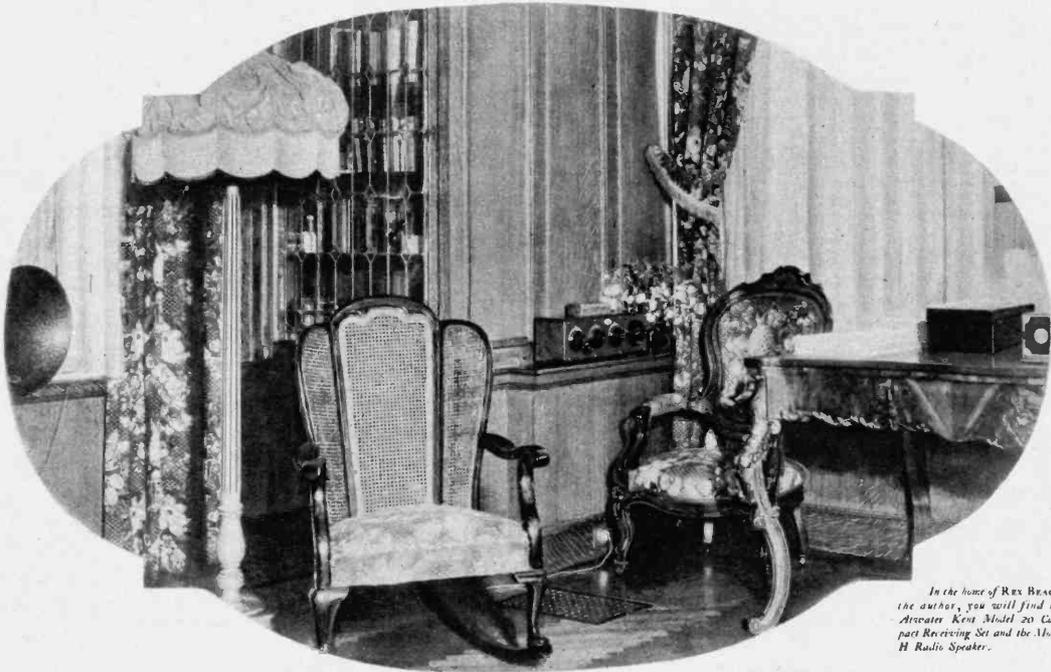
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NATIONAL CARBON COMPANY, INC.
 New York San Francisco
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EVEREADY HOUR—EVERY TUESDAY AT 9 P. M.
 Eastern Standard Time

For real radio enjoyment, tune in the "Eveready Group." Broadcast through stations—

WJAF—New York	WFI—Philadelphia	WSAI—Cincinnati
WJAR—Providence	WGB—Buffalo	WWJ—Detroit
WRE—Boston	WCAR—Pittsburgh	WOC—Des Moines
WTAG—Worcester	WCCO—Minneapolis, St. Paul	WSM—St. Louis

ATWATER KENT RADIO



In the home of Rex Beach, the author, you will find the Atwater Kent Model 20 Compact Receiving Set and the Model H Radio Speaker.

Radio is meant to be heard
—not necessarily seen



Model H, with 9' flexible cord, \$22



Model 20 Compact, including battery cable, but without tubes, \$30

Prices slightly higher from the Rockies west, and in Canada

Hear the Atwater Kent Radio Atlas every Sunday evening at 9:15 o'clock (Eastern Standard Time) through stations—
 WRAP New York
 WJAZ Providence
 WROX Boston
 WCAP Washington
 WNAB Cincinnati
 WUPP Minneapolis-St. Paul
 WWSJ Philadelphia
 WWSJ alternating Pittsburgh
 WCAP Pittsburgh
 WGR Buffalo
 WNC Dayton
 WTAD Worcester
 KMO St. Louis
 WWSJ Detroit
 WWSJ Cleveland

No longer than a row of a dozen books, no higher than your fountain pen, light enough to be carried on one hand—that's the Atwater Kent Model 20 Compact.

It is the Receiving Set of tomorrow, here today. It has all the power in half the space.

It is only 6½ inches high and 19¼ inches long. It is right in step with the modern trend of saving

space. You can put it anywhere—on a small table, beside your favorite arm-chair, among your books and flowers and magazines; no new furniture is needed.

For any room, in any home—for beauty, convenience and efficiency—you can do no better than to select the receiving set so satisfying in so many homes—the Model 20 Compact.

See it—hear it at any store where Atwater Kent Radio is sold—today.

Write for illustrated booklet telling the complete story of Atwater Kent Radio.

ATWATER KENT MANUFACTURING CO.
A. Atwater Kent, President
 4705 WISCONSIN AVENUE PHILADELPHIA, PA.



EDITORIALLY SPEAKING



The International Radio Tests

ONCE more we are all getting ready to listen in for European stations during the week of international tests.

In spite of everything that has been said and written about the craze for distant reception dying out, there is undeniably a great lure in bringing in, however faintly and unsatisfactorily, the voice and music of a station 3000 miles away. We have become more or less sophisticated in the matter of radio and its marvels, but still we have not outgrown that thrill which comes with the experience of hearing a voice just a little farther away than any we have ever heard before.

While there are some aspects of this international week which I consider unfavorable to the future of radio, still there can be no question that the results from year to year do give a very fair basis of comparison between the efficiency of transmitting and receiving equipment from one season to another. This year, the number of Americans who will receive European stations ought to be three or four times as great as last year. Transmitting and receiving equipment has been improved during the past twelve months, and, what is probably even more important, a greater number of listeners have had twelve months of experience in tuning their sets. This experience cannot but be helpful in getting these signals, just as the experience of a year or more in driving an automobile stands us in good stead in weaving our way through the traffic of a congested metropolitan street.

It is wise, however, to give a word of warning right now to those who are about to buy a set for the purpose of taking part in these international tests. Just before these tests begin, newspapers in every city will carry the usual "gyp" advertising offering the public radio sets which are "certain" to achieve the desired results of logging several foreign radio broadcasters.

By Henry M. Neely

Now it cannot be too strongly emphasized that no human being can guarantee any set to perform in a certain way in any unknown locality. Location of the set probably has more to do with the number of stations that can be logged and the satisfactory nature of the signals than any other factor in radio. Read Mr. Foote's article in this issue and you will get an idea of the various things that govern radio reception.

We are constantly getting evidence of the truth of this statement at our laboratory at Station 3XP at Delanco, New Jersey. Reception conditions there are somewhat less satisfactory than the great average throughout the country. It is impossible to say why this is so; all we know is that it is true and we are having it proved to us month after month.

I think it would be wise, therefore, for you to give this advice to friends of yours who may be attracted by the advertising which will precede this international radio week. Tell them that under no consideration are they to believe any guarantee of a set made by a dealer or a manufacturer. All that any one can guarantee is that a certain set will perform as well as any other set in the same locality. Even this is a thing which I would not like to take my oath to, but a manufacturer could make such a guarantee with the understanding that the customer's money would be refunded if the set did not pass the test agreed upon.

It is because of this that I speak of a possible unfavorable aspect of international test week.

The advertising that precedes such an event and the solicitation of salesmen unfortunately lead the non-technical prospect

to believe that a set which does not receive Europe during this week is not a good set. In spite of everything that has been written on this subject, this impression still gains ground, and it is perfectly natural that it should, because these non-technical prospects are absolutely ignorant of things in radio and they must look for guidance either to the dealer or to friends of theirs who have radio sets.

This is where the educational influence of radio magazines should be exerted to the full. You who read this magazine, and all who read other radio magazines, know that the things which I have said here are true; it is, therefore, most desirable that you, when you hear of some non-radio friend who is thinking of buying a set, should tell him the truth about the salesmen's guarantees.

Radio will never be sold widely as a competitor to the phonograph or the automobile so long as it is sold with the basic expectation of receiving great distance. The function of the radio set in the home is higher and nobler than the mere thrill of playing with a wonderful toy. That day has passed. The radio set is now an integral part of the daily cultural life of the better class family. It is on this basis that radio should be judged and on this basis alone. If, in addition to this, it should bring in the thrill of the unexpected, so much the better, but the thing to sell radio on is what can be regularly and dependably expected and not what can be accidentally brought in through a combination of circumstances which may never occur again.

So I wish all of our readers luck in getting the European stations during this test week, but I also wish them even better luck in getting steady and dependable night-after-night entertainment and education in their own homes from the wealth of material that is constantly filling the ether about us.

RADIO IN THE HOME

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Radio in the Home is a Member of the Audit Bureau of Circulation

A [EITHER or BOTH] B radio power from your house current

For 6-volt tube sets buy Socket Power "B" and Socket Power "A" in separate cases. Either may be used alone, but for *one-switch control* use both together. However, if you have a good storage "A" battery and charger, buy Socket Power "B" alone.

For 3-volt tube sets such as Radiola Super-Heterodyne, buy Socket Powers "A" and "B" built into one case and *controlled by one switch*. If you have a good storage "A" battery and charger, buy Socket Power "B" alone.

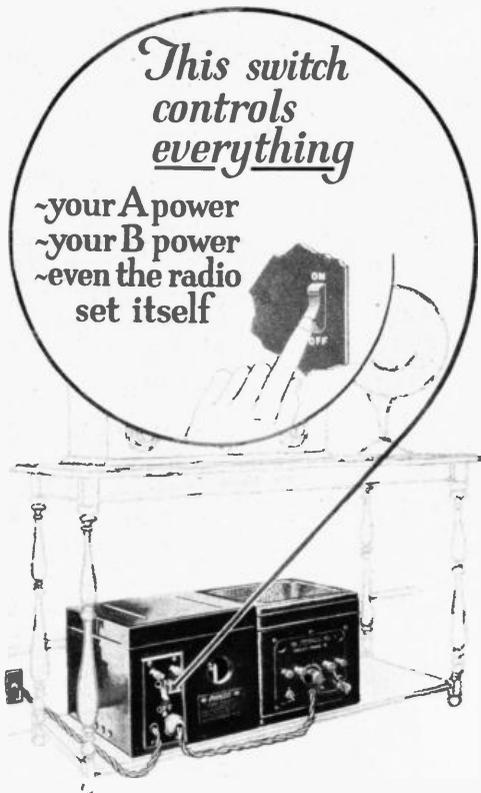
Philco "A" and "B" Socket Powers—plugged permanently into your lamp or wall socket—change your bumpy alternating house current into the smooth, *hum-free* power necessary for your radio.

No more dry batteries to replace. No more thought about battery recharging. As dependable as your electric current. Turned on exactly like an electric light.

Once you connect Philco Socket Power to your radio you never need change a single wire. You forget all about getting wires mixed and burning out the tubes of your set. You forget that radio is mysterious and technical. You just enjoy it.

When Socket Power "A" and Socket Power "B" are used together, *one switch controls everything*—"A" power, "B" power, even the radio set itself. Snap it "ON" and enjoy your radio. Snap it "OFF" and go to bed.

Sold and demonstrated by leading radio and music stores and by Philco Diamond-Grid Battery Dealers.



This switch controls everything

~your A power
~your B power
~even the radio set itself

Snap it ON and enjoy your radio
Snap it OFF and go to bed

For storage battery (6-volt tubes) either "A" or "B" Socket Power may be used alone, but for *one-switch control*, use both together. Plug the "B" into the built-in socket on the "A". Plug the "A" into your house current. Both "A" and "B" (and the radio set as well) are then controlled by the one SOCKET POWER "A" switch.

Socket Power "B" unlike ordinary "B" battery "Eliminators"—has no tubes to burn out—contains no sulphuric acid—requires no water—is full size and can be used on any set. It rectifies, filters and smooths out your house current, giving true, *hum-free*, undistorted reception at a cost of only 1/4c. a day.

For 50-60 cycle 105-125 volt alternating current \$47.50
For 25-40 cycle 105-125 volt alternating current \$52.50

Socket Power "A" is a complete "A" power unit for 6-volt tube sets. Plugged into a lamp or wall socket, it supplies "A" battery current automatically—without any thought about recharging. For 50-60 cycle 105-125 volt alternating current \$42.50
For 25-40 cycle 105-125 volt alternating current \$42.50

For Radiola Super-Heterodyne (old and new models) and other 3-volt dry-cell tube sets, use socket power "AB". Both "A" and "B" power are built into one cabinet, satin finished in brown mahogany. Connect permanently to your radio set—plug into a light socket—then turn your radio switch "ON" and leave it "ON". The one SOCKET POWER switch then controls everything.

For 50-60 cycle 105-125 volt alternating current \$65.00
For 25-40 cycle 105-125 volt alternating current \$68.50

(Prices complete—no rectifying tubes to buy)

Philadelphia Storage Battery Company, Philadelphia

PHILCO

RADIO A AND B SOCKET POWERS

Philco also builds rechargeable batteries, unique because they may be permanently connected to your radio and safely charged in your living room without changing any wires. Easier than the periodical renewing and rewiring of dry cells.

Philco Standard "B" Battery—a complete Adams-brown mahogany-finish replacement for 90 volts of dry cells. Only \$19.85!

Buy a Philco Diamond Grid Battery for your automobile

Philco "A" Batteries in acid-tight glass cases—for dry cell tubes, \$8; 6-volt tubes, \$16. Built-in charge indicators. In rubber cases, subdued mahogany color, \$14.85 and up.

Philco Radio Batteries are built *Dynamic*—DRY but CHARGED. Their life doesn't start until the dealer pours in the electrolyte. You can't get a stale *Dynamic* Philco.