

November, 1924

# RADIO IN THE HOME



Conducted by HENRY M. NEELY



**FLEWELLING**  
*Joins our staff*

In This Issue:

A Receiver With  
Perfect Quality



# Thrill With the Big Crowd

**F**OR real thrills, tense moments and dramatic situations, what can compare with a football game between two great American colleges?

A crisp fall day, stands jammed to the bursting point, bands playing, college songs and cheers, stirring the very soul of spectator and player alike—what could present a more inspiring, colorful picture?

You may not see the game, but with MUSIC MASTER attached to your radio set you can, in the comfort of your home, follow your favorite team up and down the field. The vivid word-picture of the announcer, play by play, will reach you with bell-like clarity through this wonder instrument of radio.

Until you hear the voice of MUSIC MASTER you have not heard radio at its best. Your dealer will send one to your home to prove with your own set.

Get a MUSIC MASTER and have it ready for the next game.

*Dealers Everywhere*

Connect Music Master in place of headphones. No batteries required. No adjustments.

14-inch Model, for \$30  
the Home  
21-inch Model, for \$35  
Concerts and  
Dancing

**Music Master Corporation**

Makers and Distributors of High-Grade Radio Apparatus

10th and Cherry Streets

Chicago PHILADELPHIA Pittsburgh 412-N

**Music Master**  
RADIO REPRODUCER





*Of Course It's*  
**a CROSLEY**  
 Better-Costs Less  
**Radio**

**T**O COMBINE the two most desirable things in radio—distant clear reception at the lowest possible price—there is only one radio receiver for you. That is a Crosley.

When you listen in on a Crosley—no matter what the price—you wonder, as thousands of others have, that such exceptional results can be obtained, and so reasonably.

The answer is simple—quality radio receivers built in quantity production. During the past twelve months, we believe Crosley made and sold more sets than any other manufacturer in the world. This is self-evident proof of Crosley Quality and Crosley Performance. Combined with Crosley excellence are such additional advantages as selectivity, ease of tuning, simplicity and beauty—all at the lowest radio cost.

Crosley has made it possible for everyone to own a radio receiver. You can start with the one tube Armstrong Regenerative Receiver at \$14.50, without accessories \$22.25 with tube and head phones—the lowest priced regenerative set on the market, and equivalent in reception to many two tube receivers. Then as more volume is desired, you can add to it at a very low cost.

Or, you can purchase the three tube Crosley Trirdyn Regular, which has come through the summer period of comparatively poor reception with colors flying—for only \$65. In Special Mahogany cabinet to house necessary accessories, \$75. The combination of one stage of tuned radio frequency, with regenerative detector and reflex amplification, has proven beyond a doubt that the features of selectivity, volume and ease of operation can be obtained with three tubes better than heretofore has been possible with five tubes.

We believe that no other set on the market combines these features so well incorporated in the Trirdyn.

In addition there are the Crosley 51, the two tube Armstrong Regenerative Receiver that became the biggest seller in the world in just 24 days, price \$18.50. This set will at all times bring in local stations on the loud speaker and distant stations under fair receiving conditions. Distant stations can at all times be heard with ear phones. The three tube Armstrong Regenerative Receiver Crosley 52, that brings in distant stations with loud speaker volume under practically all conditions, price \$20; and the Crosley 50 and 51 set in portable cabinets at \$18 and \$25.

These receivers, each in its own class, though assuring you as good or better reception than any other instrument of the same number of tubes, is by far the least expensive ever offered to the public.

Before You Buy — Compare Your Choice Will Be a Crosley

For Sale By Good Dealers Everywhere

Crosley Regenerative Receivers are licensed under Armstrong U. S. Patent 1,113,149. Prices West of the Rockies add 10%.

Write For Complete Catalog

**THE CROSLEY RADIO CORPORATION**

Powel Crosley, Jr., President

1160 Alfred Street

Cincinnati, O.

Crosley Owns and Operates Broadcasting Station W. I. W.



Crosley One Tube Model 50, \$14.50  
 With tube and Crosley Phones \$22.25

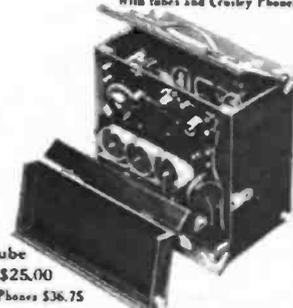


Crosley Two Tube Model 51, \$18.50  
 With tubes and Crosley Phones \$30.25

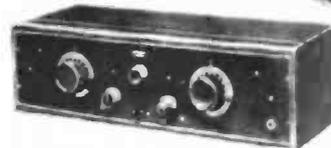


Crosley Three Tube Model 52, \$30.00  
 With tubes and Crosley Phones \$45.75

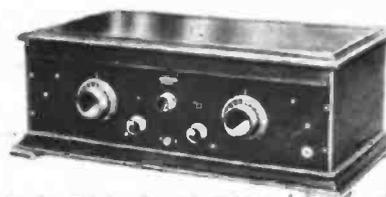
*Crosley*  
**Head Phones**  
 Better -- Cost Less  
 \$3.75



Crosley Two Tube Model 51-P, \$25.00  
 With tubes and Crosley Phones \$36.75



Crosley Trirdyn Regular, \$65.00  
 With tubes and Crosley Phones \$90.75



Crosley Trirdyn Special, \$75.00  
 With tubes and Crosley Phones \$90.75

Mail This Coupon At Once

The Crosley Radio Corp'n.  
 1160 Alfred St.  
 Cincinnati, O.

Mail me, free of charge, your catalog of Crosley receivers and parts with booklet entitled "The Simplicity of Radio."

Name

Address



## EVEREADY RADIO BATTERIES FOR EVERY RADIO USE

*Each one supremely economical and efficient for the use for which it is designed—each one made under the supervision of the world's greatest electro-chemical battery laboratory*

### *Eveready "B" Batteries*

THERE are Eveready Batteries for portable sets where small size and light weight are more important than long life. There are Eveready medium size batteries that come between the small and the large sizes. There are Eveready large size "B" Batteries that afford maximum economy and reliability of service when used with average one, two, three or four tube sets. And now there is a newer Eveready heavy duty, extra large size "B" Battery that gives similar economy to owners of multi-tube heavy drain sets and power amplifiers.

For maximum "B" Battery economy, buy Evereadys, choosing the large sizes (Nos. 766, 767, 772) for average home sets, and the heavy duty, extra large (No. 770) for multi-tube heavy drain receiving sets and power

amplifiers. For portable sets choose the Eveready No. 764 medium size, unless space is very limited, in which case choose the Eveready No. 763 small size "B" Battery.

### *Eveready "C" Battery*

Eveready makes a long-lasting "C" Battery with terminals at 1½, 3 and 4½ volts. May also be used as an "A" Battery in portable sets.

### *Eveready "A" Batteries*

Eveready offers you "A" Batteries for all tubes, both storage and dry cell. For storage battery tubes, use the Eveready Storage "A." For dry cell tubes, use the Eveready Dry Cell Radio "A" Battery, especially built for radio use.

Manufactured and guaranteed by  
**NATIONAL CARBON CO., INC.**  
 Headquarters for Radio Battery Information  
 New York San Francisco  
 Canadian National Carbon Co., Limited, Toronto, Ontario

**BUY THEM FROM YOUR DEALER**

# RADIO IN THE HOME

FOR NOVEMBER, 1924

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*Radio in the home of F. R. Coutant, East Orange, N. J.*

The photograph shows a Kennedy set, and is a good example of the beauty in design of the sets of this season

Photo courtesy of Coltn H. Kennedy Company

VOLUME III.

## RADIO IN THE HOME

NUMBER VI

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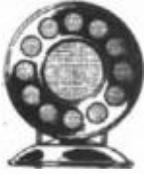
*Radio in the Home* is sold at 10c per copy at all newsstands, radio shops and bookstores. Subscription in the United States and Canada \$1.00 per year.

Printed on the rotogravure presses of the Public Ledger, Philadelphia, Pa.

Copyright, 1924, by the Henry M. Neely Publishing Company

Entered as second-class matter May 26th, 1922, at the Postoffice, Philadelphia, Pennsylvania, under the act of March 3, 1879

# Editorially Speaking



By

*Harry M. Neely*



ORDINARILY, I think it is bad policy to occupy valuable space with talk about this magazine, because I feel that most readers buy it in order to be kept informed of the latest developments in radio.

This issue, however, marks a turning point in the career of *Radio in the Home*, and as this turning point has been decided by the trend of the entire radio industry, a little talk about ourselves will reflect considerable light upon our attitude toward radio in general.

*Radio in the Home* started as a thirty-two-page magazine selling for twenty cents.

This issue is sixty-four pages selling for ten cents.

Significantly enough, the very month which sees us cutting our price in half sees one of our contemporaries raising its price, and another contemporary raised its price only a short time ago.

This magazine has spent over a year of slow and conservative activity, based upon a definite policy of not being stampeded by any of the crazes to which radio has so far been subjected. We started with a new idea in magazines — the idea that radio should not be considered merely a toy, but that it had already grown to such a stage that, with proper management, the radio set would take its place in the home upon an equal footing with the Victrola and piano if, indeed, its footing were not even superior to those two very fine instruments.

When we started the magazine, we made a definite decision to go very slowly and conservatively for a year or more. We entered a field which was already over-

crowded with radio publications, and we were not quite sure ourselves whether we had an idea which was of sufficient importance to find a useful field in the radio industry or not. We decided, therefore, not to have any circulation campaigns nor to make any attempt to force our magazine

circulation even without further efforts beyond editorial betterment.

The evidence of our growing circle of friends, however, has proved to us that we are really doing something that the radio fans want done. Therefore, it seems not only good business, but really our duty to make an active campaign now to introduce ourselves to thousands of other fans who have not had the opportunity to examine the magazine and who, therefore, are unacquainted with its personality and the principles for which it stands.

Cutting our price from twenty cents to ten cents is not done entirely through a desire to offer a bargain to the radio fan. It is the result of a settled policy to give the very best that is in us at the lowest price at which it will remain a profitable business venture.

This cut in price is made possible by a perfection of our printing process. The magazine is printed on the rotogravure presses of the *Philadelphia Public Ledger*, and heretofore it was possible to print a sixty-four-page magazine only by printing it in two sections, having it gathered and stuffed and folded by hand and then cut and bound on other machines. This

hand-work and various separate operations added enormously to the cost so that the extra expense of a sixty-four page magazine was out of all proportion to any extra income which we could derive from it.

The *Public Ledger* has now installed on its rotogravure presses the necessary machinery for feeding this magazine in at one end of the press as rolls of paper and bringing it out at the other end as a magazine all



*A clever installation. The radio set is built in one of the bookcases, and when not in use, the doors are closed, and the set is out of the way. Photo by The Photo Art House, Madison, Wis., through the courtesy of the Taylor Electric Co.*

upon our readers. We wanted first to see what the natural and unassisted growth of the magazine would be without spending a nickel on circulation.

The period of probation has now passed. With no effort whatever on our part other than getting out the best magazine we could, we have grown in actual net sales from nothing to 50,000, and have every evidence that this season would double that

**MODEL XI**

A gold-trimmed KENNEDY unit in a beautiful mahogany inlaid cabinet, with built-in loud speaker for reception of local and distant stations. Simplified tuning—only one dial is used. Each station has its own dial setting and is always found at that point. Volume can be regulated. Non-radiating. Licensed under Armstrong U. S. Patent No. 1,113,149.

Without accessories \$185.00  
West of the Rockies \$190.00



# Listen to the best in radio

**R**IGHT in your own home, with a KENNEDY, you can hear the finest programs that have ever been offered to the public. Broadcasting attracts the headliners—and it is constantly improving in quality. The living voices of great speakers, the music of operas, bands, orchestras and soloists, can be heard with brilliant realism.

New heights have been attained in perfect reception on the KENNEDY, to equal the marvelous achievements in nationwide broadcasting. Every note and syllable comes in on the KENNEDY flawlessly clear, round, full and natural in tone. It is the instrument trained musicians approve.

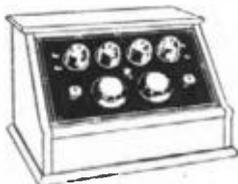
KENNEDY prices—always moderate—are even lower this season.

*Any KENNEDY dealer will gladly demonstrate the set you prefer in your home. Write for the nearest dealer's address, if you do not know where he is located.*

THE COLIN B. KENNEDY COMPANY, Saint Louis

# KENNEDY

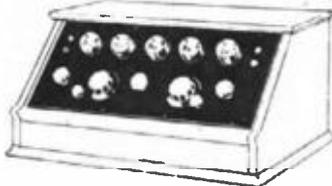
The Royalty  of Radio



**MODEL VI**

This model receives distant stations on the loud speaker. Simplified logged tuning. Non-radiating. Licensed under Armstrong U. S. Patent No 1,113,149.

Without accessories \$105.00  
West of the Rockies . . . \$107.80



**MODEL XV**

Super-selective radio frequency model. Cuts through local broadcasting and brings in distance clearly. Simple, logged tuning. Non-radiating. Operates on a loop or indoor antennae. Ideal for big cities.

Without accessories . . . \$142.50  
West of the Rockies . . . . . \$146.00

printed, gathered, folded, cut and stitched just as you have it in your hand. Everything is done by machinery in the one operation. Consequently the saving is very considerable.

We could, of course, have said nothing about this, and could have continued to charge twenty cents a copy, pocketing the extra profit. We felt that this was not good business policy. We preferred not to make money on our actual circulation, but rather to pass this saving along to our readers. Therefore, we have cut the price to ten cents, and the readers will get the benefit of all of the saving in printing cost which has been made possible by the new presses.

It is now fairly definitely decided that we will remain at sixty-four pages for the rest of the year. If we wished to go into the open market to gather in all of the advertising that is in the field, we could triple or quadruple the size of this magazine. We do not want to do this. We do not intend to be stampeded now any more than we have been stampeded the last year and a half.

Under the law, we will not be permitted to publish more than thirty-one pages of advertising in a magazine of this size. That means that the amount of advertising space which we have for sale is definitely limited, and I might here mention the fact that virtually all of it is now under contract for one year. Other advertisers cannot get in unless some of those who are in drop out voluntarily or are excluded for one reason or another.

We are willing to confine ourselves to thirty-one pages of advertising because, after a very careful survey of the radio field, we are not altogether convinced that the radio industry of today offers a greater bulk of really desirable and permanent advertising than that. When we are convinced that there are enough legitimate firms wishing to advertise with us, we may expand in order to accommodate them. For the present we propose to solicit only from the firms we consider to be absolute leaders in the radio field. I am quite sure

that our readers will be interested in knowing something about this view of ours toward radio advertising.

I notice in last month's issue of *Popular Radio* a very proud announcement of their establishment of a laboratory and of their adoption of a policy of accepting no advertising of apparatus which does not pass the rigid test of this laboratory. They say that they made this announcement some time ago to manufacturers and asked the opinions of these manufacturers on this

good thing when *Radio in the Home* established it nearly two years ago.

Furthermore, to show the difference in viewpoint between various laboratories, it is an interesting fact that in the edition of *Popular Radio* announcing their rigid inspection, they are carrying four and one-half pages of advertising which has been definitely refused by this magazine and six and one-half pages of advertising which we will not accept if it is offered to us. Another interesting sidelight in this situation is shown in last month's issue of *Radio News*. In their two pages of announcements of the awards of "certificates of merit," given by their laboratory, they gave quite an enthusiastic description of a certain variable condenser, and awarded that condenser their certificate. They tell of the various electrical tests through which this condenser was put and of the excellent results.

It just happens that the manufacturer sent us two of these same condensers some time ago. Our preliminary test resulted just as did the tests of *Radio News*. We are not, however, satisfied to decide upon a variable condenser on preliminary tests. A variable condenser like many other pieces of radio apparatus, may pass with flying colors through a preliminary test and then very quickly go to pieces under actual use.

We took one of these variable condensers and put it in a wave meter and placed the other on our shelves without taking it out of the package. After using the wave meter for some time, I began to be suspicious of its accuracy. I checked up

again on it and found that the entire curve had moved. Then a little later I became suspicious that the internal works of the meter were not correct. I opened it and examined the variable condenser.

I found exactly what I suspected. The plates of the variable condenser had warped so badly under ordinary changes in temperature that the condenser was entirely shorted and was useless. In order to prove that this had not been (Continued on Page 38)

## Our Most Successful Hook-Up

WE HAVE printed many successful circuits since this magazine was established and we have been amply rewarded by the hundreds of enthusiastic letters of appreciation from readers to whom these circuits have brought the joys of satisfactory radio reception. But we have never given a circuit which has met with the flood of praise that has poured in on us following our inverse-duplexing of the neutrodyne.

Dozens of visitors at the Radio Show in Madison Square Garden, N. Y., sought our booth simply to tell us of the consistent satisfaction they were getting from their sets. Best of all, there were many who said they had never before tackled the job of wiring up a set because of lack of skill and experience, but that our new 3XP-Style wire-ups with the check-up lists were so simple, complete and inviting that they could not resist the temptation to try just once. So they tried—and succeeded! The very greatest compliment that could be paid this new idea in wiring diagrams is that absolute novices were enabled to construct a most complicated set as their first job and that they succeeded so easily as to remove all the difficulties from radio construction.

Many of the visitors to our booth in New York claimed that they were frequently receiving Pacific Coast stations with the outdoor antenna attached to the center turn of the loop aerial. They seemed unanimous in the opinion that the inverse-duplexed neutrodyne is the greatest circuit ever given to the radio public for home construction. All who have tried it say that they are no longer interested in any idea of building a superheterodyne. Thank heaven for that! If this circuit will only kill the home-made super once and for all, it will be the greatest blessing in radio!

One lesson we have learned from our New York friends and from letters from other sections. That is, that any standard makes of apparatus of equal electrical values and ratios will function satisfactorily with very little change in the bypass condensers. Two of the New York visitors said they used Acme low ratio audio transformers with no change in bypass condensers. And here is a letter from a reader which shows that the circuit will deliver with almost anything:

Smackover, Ark., Sept. 23, 1924.

Dear Mr. Neely—

It might interest you to know that I have constructed a Grimesed neutrodyne and am getting wonderful results. I will tell you the parts I have used.

I was unable to get the exact parts you named in your wonderful magazine, *Radio in the Home*, so I collected all of the spare parts I had on hand, which were:

- Three Federal No. 65 audio transformers.
- One Acme R-2 radio transformer.
- Four Fada sockets.
- One Fada 400-ohm potentiometer.
- Two Fada 6-ohm rheostats.
- Two Bremer Tulley 23-plate vernier variable condensers.
- I used one of these on a Fada neutroformer coil.

(Continued on Page 42)

policy. They say that the manufacturers wrote that such a policy was a wonderful one and that it would undoubtedly have to be followed by other magazines.

It would have been very interesting if *Popular Radio* had printed one of these letters, a copy of which I happen to have. It was from a very prominent manufacturer, and it informed *Popular Radio* that he thoroughly approved of this policy—that in fact, he had thought it a mighty

# MAGNAVOX Radio

Receiving Sets which establish an authoritative standard of excellence for the daily enjoyment of radio.

**M**AGNAVOX SETS mark that important stage in the development of Radio when the practical engineer has translated the experimenter's hopes into actual facts—when, in brief, so efficient a type of apparatus has been designed that it can be manufactured with the economy of a popular motor-car and purchased in full assurance that it will operate with maximum ease and dependability.

Extreme flexibility both in the selection of broadcasting stations and the volume of reproduction has been secured in Magnavox Receiving Sets along with unequalled simplicity of control. The usual difficulty of satisfactory tuning has been done away with through a unique method of *automatic* tuning which makes it possible to select any particular station directly on *one* dial. This same broadcasting station, whether near or far, can always be heard when the Magnavox Unit Tuner is turned again to the same point.

To meet every radio requirement, the Magnavox circuit is offered in two types of cabinet, as described below.

### TRF-50

A 5-tube tuned radio frequency receiver in carved cabinet (illustrated on right), with built-in Magnavox Reproducer and space for "B" batteries. Magnavox tubes are highly recommended. With Magnavox detector tube but no batteries. \$150.00

### TRF-5

The same tuned radio frequency circuit as TRF-50, encased in smaller cabinet without built-in reproducer. Cabinet measures: height, 9 3/4 inches, length, 20 1/2 inches, depth, 14 1/4 inches. With Magnavox detector tube but no batteries or reproducer. \$125.00

Magnavox Radio Products are now a complete line, including Receiving Sets, Vacuum Tubes, Reproducers, Power Amplifiers, Combination Sets, and Phonograph Radio Attachments. When buying radio equipment, always look for the name Magnavox.

Reliable dealers everywhere carry Magnavox Products in stock. If unacquainted with the Magnavox store in your vicinity, write us for information and literature.

**THE MAGNAVOX CO., OAKLAND, CALIFORNIA**

NEW YORK: 350 West 31st Street

SAN FRANCISCO: 274 Brannan Street

Canadian Distributors: Perkins Electric Limited, Toronto, Montreal, Winnipeg



PATENTED IN U. S. A. AND FOREIGN COUNTRIES  
This trademark guarantees satisfaction in radio equipment



MAGNAVOX RADIO TRF-50

The special feature of this model is its conveniently arranged cabinet with built-in Magnavox Reproducer. The cabinet is beautifully carved, with hand rubbed antique finish: height, 14 3/4 inches, length, 20 1/2 inches, depth, 18 1/4 inches. When not in use, the panel is protected by dust-proof doors.



M4



TRF-5



# THE FAMOUS 3XP!

*The 3-Tube Inverse Duplex Combining  
Tuned Radio With This Super of Reflexes*

This new arrangement of the Grimes System which created National enthusiasm when first developed in the Laboratories of "Radio in the Home" and described in the June and July Issues, is NOW, for the first time, produced for you in this Official Laboratory Model.

Of course, the Inverse Duplex Principle is well recognized in these unique outstanding features.

- (1) *The only Balanced Circuit.*
- (2) *A Three-Tube System really giving Six-Tube Results.*
- (3) *Natural Reproduction that only Inverse Duplex can give.*

## SPECIFICATIONS

2 Stages of Tuned Radio Frequency	Rubber-Hung Sockets
Tuned Fixed Detector	Chamber for Batteries
3 Stages Audio Frequency	3-Control Selectivity
Sloping Panel	Antenna and Ground Operation

Mahogany Cabinet

## INVERSE DUPLEX

**Insures Natural Tone Quality**

LICENSED UNDER PATENTS ISSUED AND PENDING

**INVERSE DUPLEX SYSTEM**  
**Insures Natural Tone Quality**

Licensed Under Patents Issued and Pending

*Jobbers' territories are  
being allotted very rapidly.*

Retail Price  
(without accessories) only **\$85.00**

*For further information apply to your jobber or direct to*

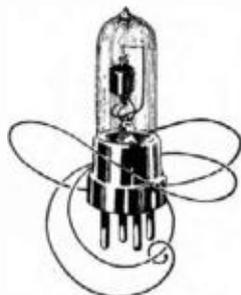
# DAVID GRIMES, Inc.

1571 Broadway : : : New York, N. Y. : : : Strand Theatre Building

# Radio in the Home

## GRIMES-FLEWELLING-HARKNESS

*Associate Editors, Writing for No Other Magazine*



# Flewelling Joins Our Staff

**R**ADIO IN THE HOME takes pleasure in announcing in this issue a new appointment to its editorial staff as an Associate Editor. E. T. Flewelling, famous as the designer of the Flewelling circuit and one of the foremost figures in the development of modern wireless communication, joins our staff now to write for us and for no other magazine.

Grimes, Harkness and now Flewelling! Soon they will be after us under the anti-trust laws!

Mr. Flewelling brings to his new task unusual qualifications. With his name a household word both in this country and abroad and his reputation as an authoritative writer and contributor to the scientific and technical development of radio well established, he needs little introduction to the dyed-in-the-wool fan. There are, however, high lights in his career which are interesting to review.

Flewelling belongs to that select category of more or less youthful pioneers who had the vision to foresee the possibilities of radio. Young in years—he is only thirty-seven now—but a veteran in experience, Flewelling has put heart and soul into radio for the last twenty years.

As a boy he belonged to that small group of earnest amateurs who swelled with joy to find a sensitive piece of mineral that would serve as a crystal detector, and which, in combination with a few others of the crude bits of apparatus then available, was capable now and then of intercepting a stray wireless signal. Nor did he hesitate to filch the zinc plate from under the family heating stove so that he might construct a condenser—such as it was.

Flewelling is a native of Boston, where he was born in 1887.

Shortly after Marconi made his first attempts at commercialization of wireless telegraphy, Flewelling, then a lad in high school, became

*Edmund T. Flewelling,  
Associate Editor of  
"Radio in the Home"*

an enthusiast. He collected a few coils and awkward-looking pieces of equipment and established a "laboratory" in his home. The subject fascinated him, and it was here that he laid the foundation of the technical training which later enabled him to give to the world one of the best known contributions to radio—the Flewelling circuit—and subsequently a modification of that circuit which added materially to the luster of its reputation.

The Flewelling circuit always has been known as a "tricky" one—a "hook-up" that required some skill in construction and operation. It has been a circuit famed for its efficiency, but likewise for the requirement that it be carefully built and used.

Flewelling has devoted many patient hours of research and experimentation toward eliminating this trickiness and has at last solved his difficulties. His findings—which will constitute the third modification of his original circuit—will be given to the world through the columns of this magazine.

*The fan who builds this latest development of the Flewelling circuit will be virtually assured of its absolute stability and efficient functioning. In brief, it comprises practically all of the advantages and none of the disadvantages of its predecessors.*

Flewelling has won considerable acclaim in the fraternity as one of the few writers in radio who can translate in clear, simple language the more technical problems of the art. With this he has combined a rare vein of subtle humor which has made his articles on the subject highly fascinating.

An outstanding characteristic of Flewelling's career has been his vision. As a boy in high school he revealed his dreams to a youthful sweetheart.

"Some day in the future," he

(Continued on Page 40)



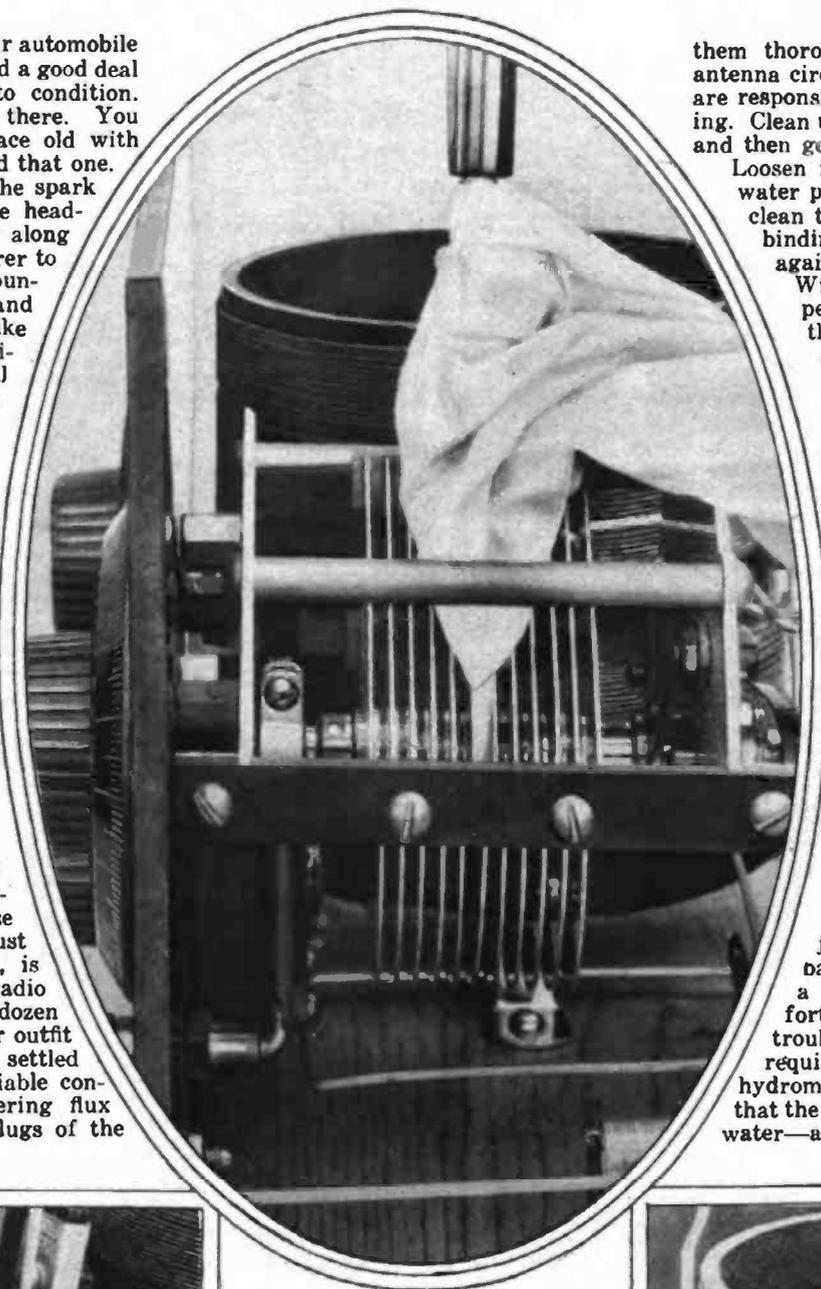
# Now's the Time to Overhaul

By BRAINARD FOOTE

WHEN you fare forth on your automobile tour, you invariably spend a good deal of time getting your car into condition. You add grease here and oil there. You examine the rubber and replace old with new. You tighten this bolt and that one. You test your battery, clean the spark plugs and the contacts of the head-light bulbs. And if you carry along your field glasses to bring nearer to you a view of some distant mountain, you take them apart and carefully clean their lenses. Like the car, they'd "do" for ordinary purposes, but for special exertion some special attention is essential.

And so with your radio receiver. Local stations may come in aplenty and no doubt those little scrapes and scratches you hear when you twist the dials are too insignificant to worry about, for the first blast of the band from WIP drowns them out completely.

But how is it going to be this winter, when you apply the daintiest touch to those dials in a serious endeavor to coax the announcements from coast to coast into your head receivers? Wouldn't you feel better if those frying and sizzling sounds were gone absolutely? Right now, while those cross-continent fellows are just beginning to trickle through, is the time to accomplish your radio house cleaning. There are a dozen and one loose contacts in your outfit—a pretty collection of dust settled among the plates of the variable condensers—perhaps some soldering flux draped across the soldering lugs of the

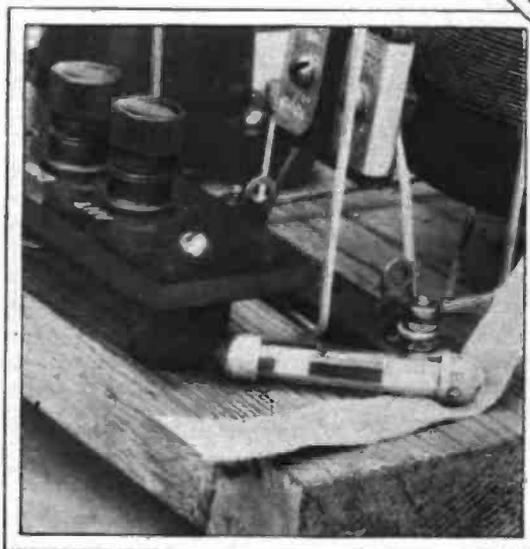


them thoroughly. Poor contacts in the antenna circuit can't be condoned, for they are responsible for much broadness of tuning. Clean up the connections at the lead-in and then get busy with the ground clamp. Loosen it, clean off the surface of the water pipe with some fine emery cloth, clean the inside of the clamp and the binding post before you put it on again.

With the antenna all secure and in perfect working condition, attack the set itself. Disconnect aerial and ground and listen in with phones on the detector. Do you hear any grinding and scratching noises?

Joggle the tube in its socket and note whether a scraping sound results. Move the jack contacts a bit with your fingers. Turn the contact switch. Poor joints may in this way be tracked down and eliminated.

A persistent frying noise is usually due either to soldering flux on the jack insulation and lugs or to imperfect "B" batteries. Once in a while a poor connection between the storage battery and the wires running to it will cause a frying or squeaking sound. Then insert the plug in the second jack, repeating the fingering process and finally in the third jack. If possible, test the "B" batteries with a voltmeter and if a 45-volt unit shows less than forty, discard it as likely to cause trouble. The "A" battery merely requires the customary attention of hydrometer test and charging. Be sure that the tops of the plates are well under water—adding distilled water if need be.

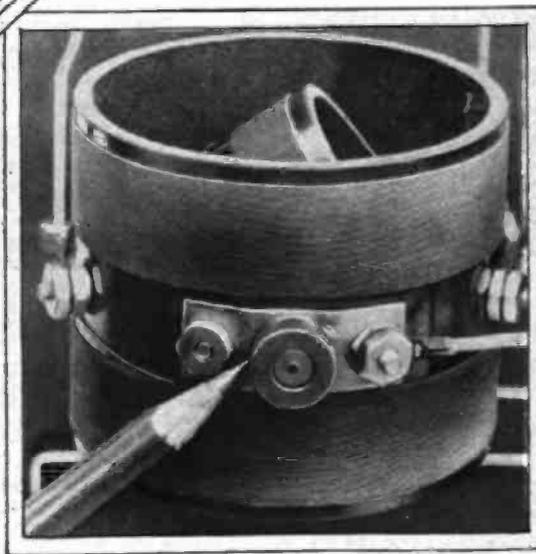


(Fig. 5)—Noises caused by bad connections near the grid are amplified seven times by the tube. Hence be sure all connections are perfect

(Fig. 7) — This takes time, especially if the condenser has 43 plates! But the dust must be removed. The blower of your vacuum cleaner will do the stunt more effectively

jacks—and tube sockets with prongs bent and dirty.

Start up on the roof with the antenna. Take along a rag and some gasoline or alcohol. Rub the dirt and grease off the insulators and examine the supporting wires for incipient breaks or insecurity. Wiggle the soldered joints to test their strength. And if there are any unsoldered joints don't go another step until you clean and solder



(Fig. 1)—The pencil points out a friction contact in a variocoupler that may become dirty and give rise to scratchy sounds in your phones. To fix it—take it off and clean it

Next disconnect all the batteries and remove the receiving set from the cabinet. Put it somewhere in a good light, preferably daylight, where you won't have to strain your eyes in your search for dirt in out-of-the-way points. First wiggle the connecting wires to locate any unsoldered joints and repair them at once. Tighten any loose binding posts, nuts or screws you can find. Frequently the binding post on the corner of a socket will become loose and to tighten it, the connecting wire must be taken off. Sometimes the socket must be lifted off the baseboard so that the screw heads may be kept from turning as the fastening nut is tightened above it. It's worth a little extra time to do this job if you find socket screws loose.

When you have tightened up every joint in

seconds' labor to loosen the set-screw holding the collar on the shaft and to clean the rubbing surfaces with a piece of fine emery cloth or sandpaper. This advice applies to rheostats particularly, since contacts there carry an appreciable amount of current, and

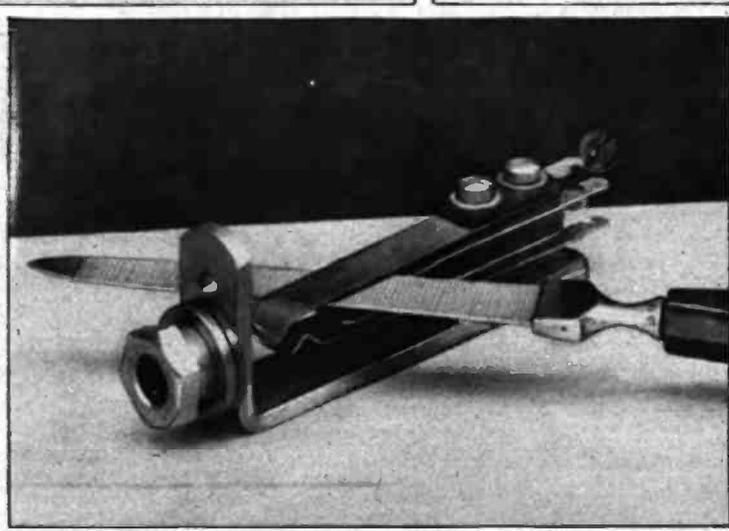
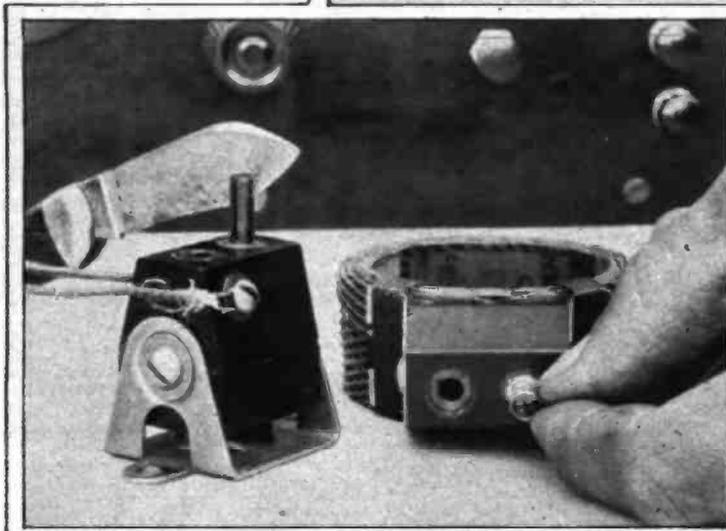
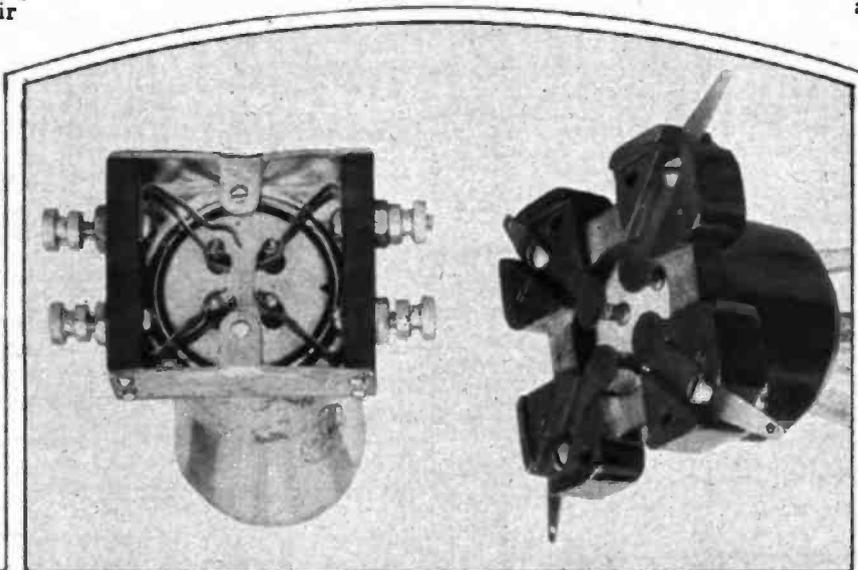
there's nothing more annoying than a noisy rheostat, particularly in the detector circuit.

The interior of couplers and inductance coils should be inspected for loose wires or joints which have become unsoldered.

Another common producer of rattles and scrapes is poor contact

between switch lever and switch points. See Fig. 2. Not only does a streak of grime on the points cause noises as the switch is moved, but it interposes a high resistance in the tuned circuit. This cuts down the signal volume and at the same time considerably broadens the tuning. With so many broadcasting stations on the air together, sharpness of tuning is absolutely necessary for any kind of long-distance reception.

Such grease settles with the dust from the



(Fig. 4)—It's easy to repair the joints of honeycomb coils and their mountings in this way. Spread the plugs so they'll fit tightly

sight and have the wiring all firm and ship-shape, examine all of the tuning instruments for friction contacts. These often give rise to scrapes and grinding noises as you turn the rotors of couplers, adjust rheostats and switches.

In Fig. 1 we have a typical case of friction contact. Any uncertain contact at such a point is usually manifest while the set is being used, for there's a scratchy rattle in the phones as the tickler is varied. It is but a few



(Fig. 3)—Before sandpapering the socket and tube contacts, take a look underneath and see where the contacting parts are located. Bent springs must be straightened, also

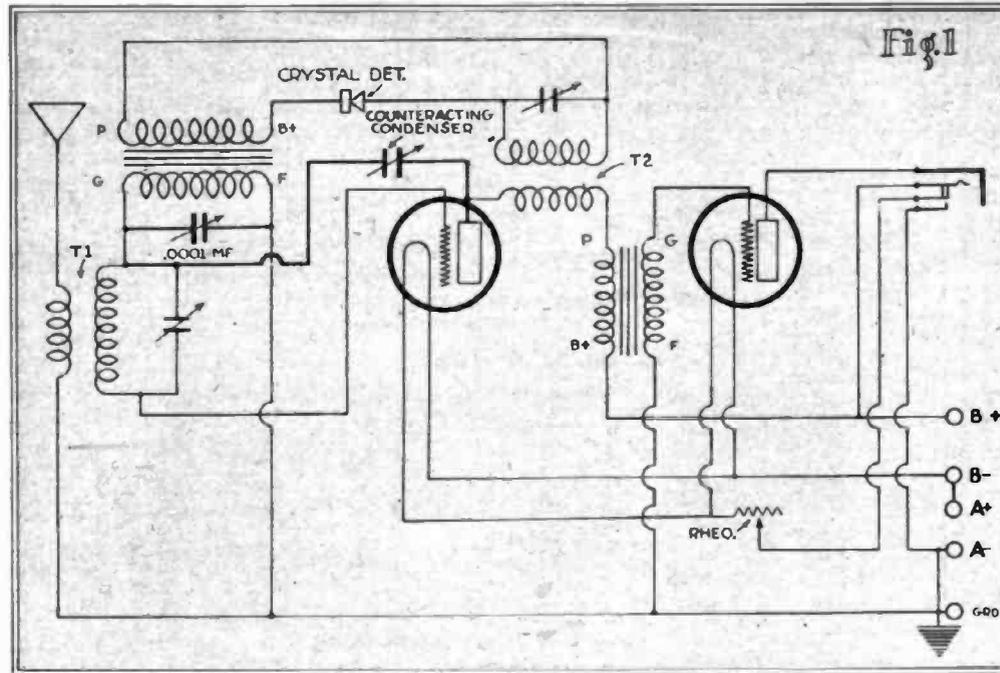
(Fig. 2)—Soiled switch points aren't permissible, for they introduce resistance into tuned circuits and ruin the selectivity. The end of the blade must be cleaned, too

(Fig. 6)—Two or three strokes with a nail file will clean jack contacts. Remove dirt and flux from the insulating strips and lugs besides

air and with oil from the fingers soon forms a dirty coating on the contact points. Alcohol or gasoline on a rag will remove most of it, and a piece of fine emery or sandpaper will clean the points up nicely. Don't rub more than necessary with the emery, however, for fear of taking the nickelplate off along with the dirt.

Perhaps the most outstanding reason for noisiness in sets may be found in poor joints between the prongs of the vacuum tube and the

(Continued on Page 60)



# How the Harkness Reflex can be changed to the Harkness Counterflex

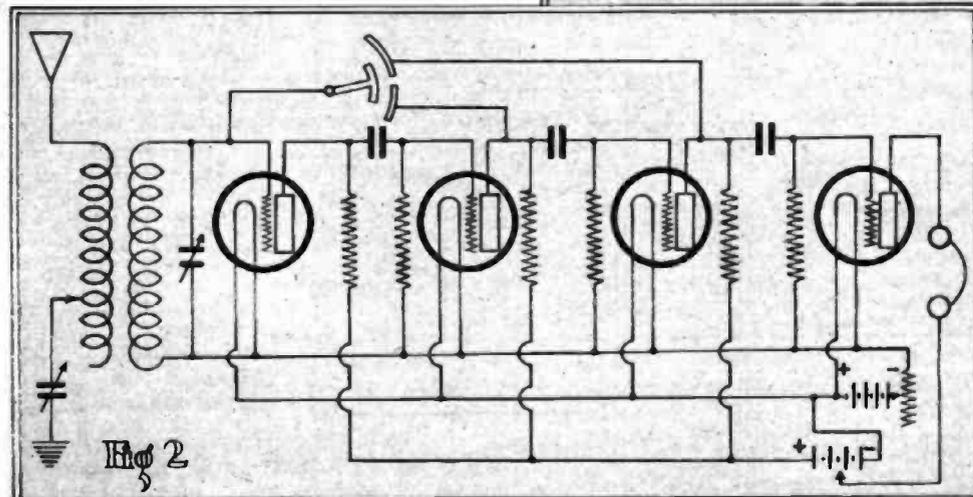
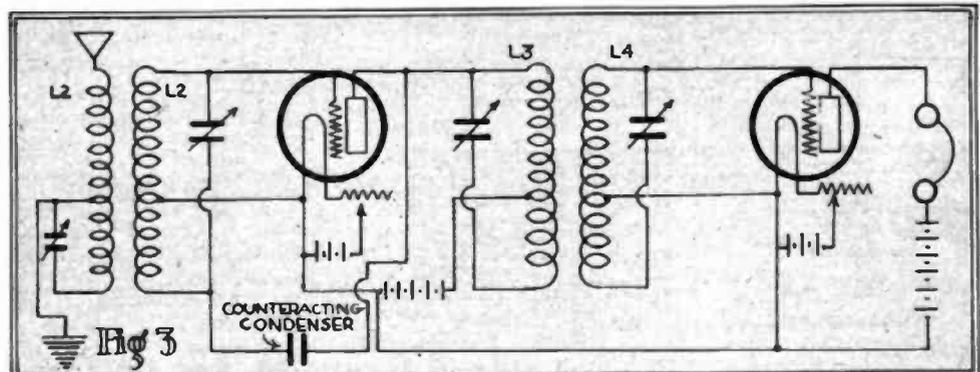
SOME practical circuits embodying the new Harkness Counterflex system were shown in this magazine last month, together with a description of the parts necessary to construct them. Other developments of the Counterflex system will be given in future issues. In the meantime, however, I am going to anticipate a question which many readers will probably ask and show how to change a "Harkness Reflex" receiver into a "Harkness Counterflex" receiver.

The diagram of Fig. 1 illustrates how this can be done. I do not especially recommend the circuit of Fig. 1, as I believe a vacuum tube makes a better rectifier in the Counterflex circuit than a crystal detector—at any rate, until some one designs a fool-proof crystal detector—but this circuit can be used by those who already possess Hark-

By **KENNETH HARKNESS**

Associate Editor,  
Radio in the Home

ness Reflex receivers to incorporate the Counterflex system with the least amount of trouble and expense. To make the change, follow the directions given below:  
Rewind the radio-frequency trans-



formers so that T1 has ten turns on the primary and sixty turns on the secondary, and so that T2 has a primary of twenty-five turns and a secondary of fifty-five turns.

Connect a small fixed condenser with a capacity of about .0001 mfd. across the secondary of the reflex audio-frequency transformer, as shown in Fig. 1.

Connect a counteracting condenser in the circuit as indicated in Fig. 1.

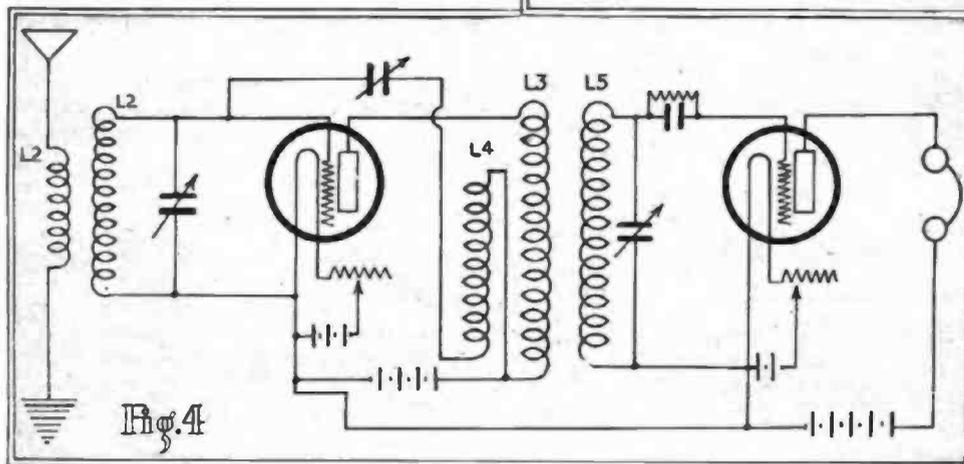
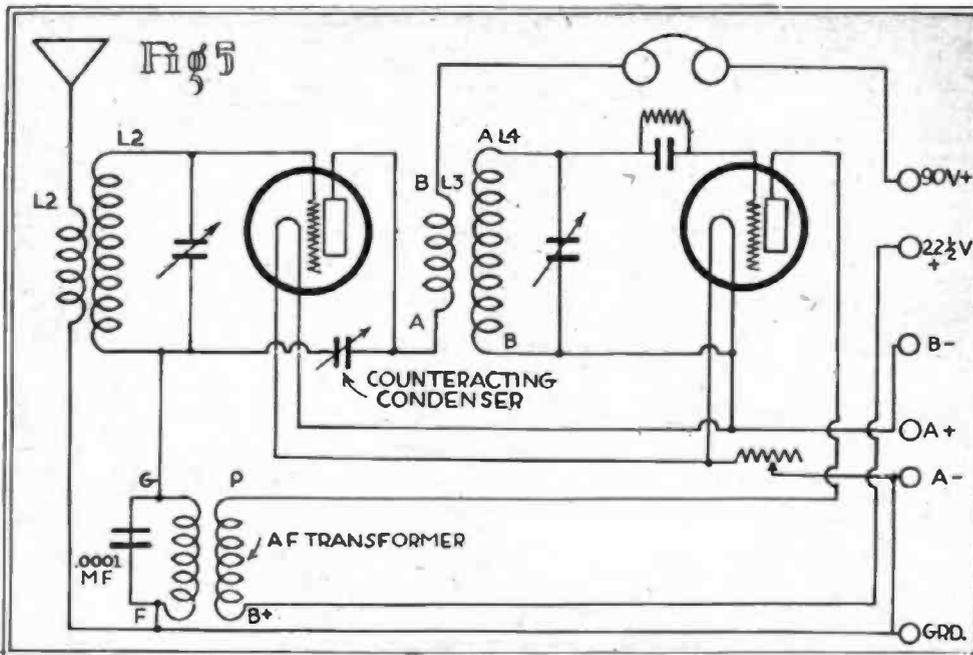
The counteracting condenser need not necessarily be of any special type, but it must cover the necessary range of capacity. The minimum capacity of this condenser should be very low and the maximum should be about .00006 mfd.

Many of the small, so-called "vernier" condensers will answer for this purpose;

but those that exceed the stipulated maximum capacity will not be found altogether satisfactory.

In the last month's issue of *Radio in the Home*, I introduced the new Counterflex receiver and explained that the method of controlling self-oscillation in this receiver was chiefly responsible for its unusual efficiency. This month I am going to explain in more detail the "counteraction" method of controlling self-oscillation, as used in the Counterflex. In conjunction with former articles this explanation will assist the users of Counterflex receivers in obtaining the maximum efficiency from their sets. The Counterflex is easy to operate, but, in common with every other receiver, the best results can be obtained only by an operator who is familiar with the functioning of the circuit and with the objects of the various controls.

In the July issue of this magazine I explained the causes and effects of self-oscillation in a radio-frequency amplifying receiver and briefly described some of the



tube of opposite polarity, "in which the voltage decreases when the voltage of the grid increases." In other words, these inventors clearly suggested a method of using counteraction to control self-oscillation and were, to the best of my knowledge, the first experimenters to use counteraction for this purpose.

Fig. 2 shows their most interesting application of this principle. The grid of the first tube of this resistance-coupled radio-frequency amplifying circuit is connected to the movable plate of a special three-plate variable condenser. The two stationary plates are connected, respectively, to the plates of the second and third amplifying tubes. By connecting the condenser in this manner one fixed plate feeds back *positively* to the grid of the first tube and produces *reaction*, while the other fixed plate feeds back *negatively* and produces *counteraction*. The respective values of these two opposing feed-backs can be altered by turning the movable plate of the condenser. There is one position of the movable plate at which the negative feed-back neutralizes the positive feed-back. At any other position one is stronger than the other.

By increasing the reaction, continuous oscillations can be produced, if desired. By increasing the counteraction self-oscillation can be damped out.

The method used in the neutrodyne system is very similar to the one set forth by Brillouin and Beauvais. Counteraction is obtained by coupling the grid of one tube to the grid of the succeeding tube by means of a small fixed capacity. The neutrodyne circuit is probably



familiar to most readers. An entirely different method of controlling self-oscillation, using counteraction, is described by Chester W. Rice in U. S. Patent No. 1,334,118, granted 1920. The method is shown in Fig. 3. Counteraction is obtained by connecting the filament of the vacuum tube to the central point of inductance, L2, then connecting one side of this inductance to the grid and the other side, through a small fixed condenser, to the (Continued on Page 38)

methods which could be used to control self-oscillation. In the October number the Counterflex method was briefly explained. To avoid repetition of matters already discussed I am omitting the general explanations which might otherwise be necessary and am presuming that the reader of this article is familiar with the following facts:

1. That self-oscillation causes whistling and distortion in a radio receiver and must be eliminated to receive radio broadcasts.
2. That self-oscillation is caused by reaction—the feeding-back of energy from one or more circuits to preceding circuits of the receiver.
3. That even in a well-designed radio-frequency amplifying receiver there is sufficient unavoidable reaction present to cause self-oscillation, the reaction mainly being produced by the capacitive coupling between the elements of the vacuum tubes.
4. That self-oscillation, caused by reaction, can be controlled by the use of counteraction; in other words, by coupling the circuits of the receiver to produce a negative feed-back effect which completely or partially neutralizes the positive feed-back effect of reaction.

As suggested by its name, the Counterflex uses counteraction to control self-oscillation. It is by no means the first receiving system to use counteraction for this purpose, but the Counterflex method is a new application, and is, in my opinion, the simplest and most effective

When applying for patent protection on the Counterflex system, it was necessary for me to investigate the methods used by other experimenters to control self-oscillation by means of counteraction. The results of this investigation will assist the reader to understand the differences between the various methods.

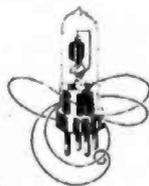
Many radio fans are probably of the opinion that the neutrodyne was the first receiver to use counteraction (or neutralization as it was called) to control self-oscillation, but the use of counteraction for this purpose was clearly defined many years before the neutrodyne made its appearance. In 1919 British patent No. 127,014, was granted to Brillouin and Beauvais, two French engineers who had already been granted French patents on a resistance-coupled amplifying system using both reaction and counteraction. The French patents were, I believe, granted in 1916.

In describing their invention Brillouin and Beauvais explained that, to control self-oscillation in a resistance-coupled amplifier or in an amplifier with resonant circuits, the grid of one amplifying tube may be coupled, by means of a small condenser or high resistance, to the plate of a succeeding

# WTAM



*L. W. Zimmerman, program and studio director, who brings a wealth of semiprofessional experience to bear in arranging a balance of program offerings*



*S. E. Baldwin, manager, who has been with the Willard Storage Battery Co. for eight years as advertising manager. When WTAM passed out of the experimental stage, the management of the station was turned over to him*

By

**P. A. PRICE**

*Cleveland Correspondent of Radio in the Home*

**O**UT in Cleveland's manufacturing district, not far from the shore-line of Lake Erie, there is a neat little cottage set between two lofty towers of steel. Overhead, between the insulating spars of wood that tops the towers, are swung two parallel aerials in cage formation; each made up of six wires spaced by insulating frameworks. From the center of the span drops a cascade of wire, entering the roof of the cottage. Far beneath the aerial is a network of wire forming the counterpoise and clearing the ground by ten or twelve feet.

Such is an exterior view of the broadcasting station WTAM, owned and operated by the Willard Storage Battery Company, of Cleveland, Ohio.

Within the cottage, a cheery reception hall welcomes one from the stoop. Adjoining the hall is the studio, draped in the conventional gray of monks' cloth and with the floor and ceiling deadened to vibration. Colored lights flash signals for

the announcer to and from the operating room that, with the battery vault, occupies the rear of the cottage.

In the operating room, the switchboard panel and its associated equipment of tubes and coils take up the greater space. The aerial enters here, protected by lightning arresters, and the counterpoise and ground connection find their outlet.

The battery vault occupies the adjoining room. Here, stacked tier upon tier, are the twelve hundred and eighty individual storage cells, each in its glass jar, supplying the one thousand watts of power that, on a frequency of seven hundred and seventy-two kilocycles, is sent hurtling into space, bearing its intangible gifts of song and story.



There is no piece of moving machinery in the building. Exhaust fans, far removed, draw off the acid-laden gas of the bubbling storage cells, and another remote control ventilating system supplies fresh, cool air to other rooms of the building. The nearest street car is a quarter of a mile away. Through the day a lumbering switch engine prowls about the neighborhood, picking up carloads of automobiles from the

*The famous WTAM Dance Orchestra, E. V. Jones, director. This is the aggregation of artists who provide those provocative dance numbers on Saturday nights*



*A. K. Harske, announcer. "Art" is a likable chap with a good voice and pleasing personality*

Chandler factory and other products from other manufacturing plants in the vicinity, but at night there is silence all about save when a door of the station is opened and a strain of music steals out into the darkness.

What could be more natural than for the Willard Storage Battery Company to operate a broadcasting station? Pioneers in the field of making storage batteries for automobiles, it was to be expected that the enormous requirement of "A" and "B" batteries for radio equipment would find the company early in the field in providing what it believes to be the most satisfactory and economical source of power for operation of radio sets. from

*John T. Vorpe, publicity director of WTAM*

the simple one-tube affair to the eight or ten tube superheterodyne.

It was only a step from providing for the receiving set to supplying a dependable source of power for the broadcasting stations. So the list is long that enumerates the 160 stations using Willard storage batteries to supplant motor-generators, and the switch engine that prowls about the neighborhood picks up many a carload of radio batteries from the immense shipping rooms of the company.

All the Willard folk are radio enthusiasts, from big, bluff Theodore A. Willard, president of the company, to the yard men who guide heavy trucks about the plant. Everybody has a "set" and it is not used always to tune in on WTAM programs, either; to be able to "go through the Willard" and get a distant station on anywhere near the same wave length of 390 meters,



*Bernard L. Strang, publicity man of WTAM*

man's Sunday rest is disturbed by visions of Monday's mail.

With Ev, and sharing almost equal popularity, is "The red-headed banjo player." Art Harske, the announcer of WTAM, framed the appellation which refers to the player rather than the instrument. (Few banjos are red-headed). Anyway, "The red-headed banjo player" in private life is Worth Munn, otherwise known as "Rook." Mayhap he can sing; perchance he is a silver-throated tenor of purest note serene, but that is neither here nor there on Saturday night when he twangs a mean twang on the banjo strings and has

*S. E. Leonard, chief operator. Mr. Leonard was a naval radio man during the war, with an extensive marine experience before that time*

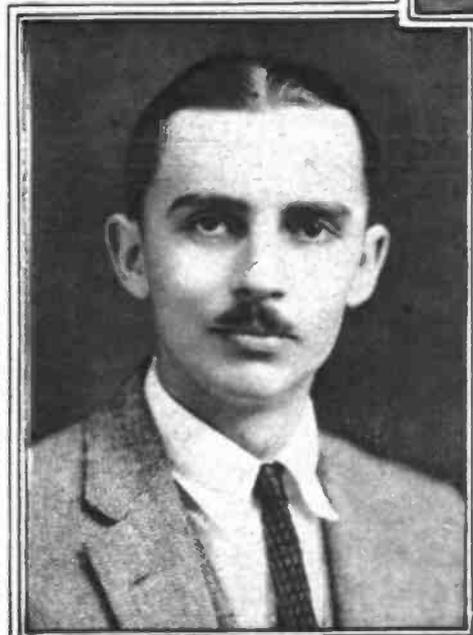
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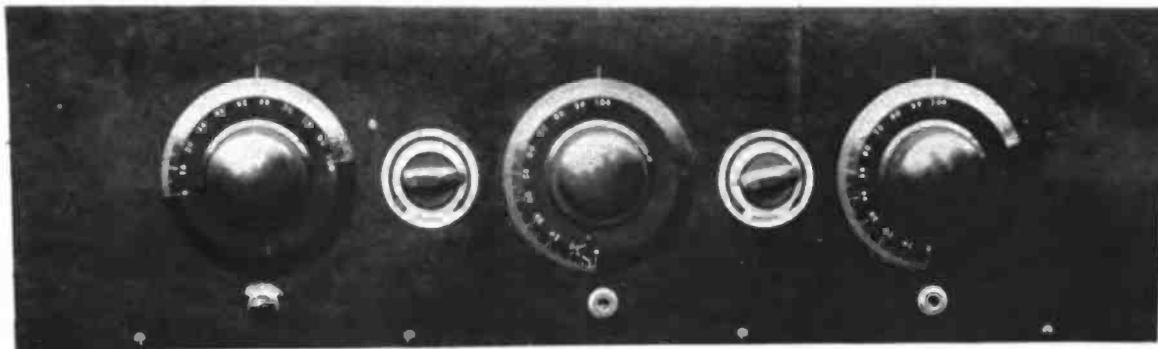


*Miss Agnes Mitchell and Miss Margaret Roach, of the staff of WTAM*

is an accomplishment in Cleveland. But nobody bothers about distant stations on Saturday evenings, when the WTAM Dance Orchestra holds forth under able direction of Ev Jones.

Ev Jones cannot sing. As director of the orchestra Ev Jones is peerless. But he cannot sing; everybody said so. But he does sing; sings freely and feelingly; sings with abandon and insouciant sang froid; sings without fear of successful imitation. Nobody knows how he does it, but he does. He does not essay operatic arias; he would tremble visibly at mere suggestion of *Il Pagliaci*. But when it comes to telling of his amours "last night on the back porch, when I loved her best of all," or informing the audience that "It ain't a-goin' to rain no mo', no mo', Ev does these little things with such candor and clarity that applause cards come in by the hundreds and the post-





# Inverse Duplexing the Pfanstiehl System

*for the man who values  
quality in reproduction  
above the craze for  
super DXsharpshooting*

WE are giving here with the answer of Station 3XP to the many demands from our readers who want perfect quality of reproduction rather than excessive volume or superlative distance-getting ability in a radio set. This set has been designed for the man who wants real music in his home and who requires a moderate amount of distance-getting in addition to this, but who does not demand that his set give him perfect reproduction and at the same time a range equal to the supposed range of a ten-tube super-heterodyne.

Let me say that this set, while it does not seem to have quite the punch on a loop that we have had from the inverse duplex neutrodyne, is far superior to the former set in quality of reproduction and, when an outdoor aerial is brought in and clipped to the middle tap of the loop, and the ground wire clipped to one outside turn, its distance-getting ability is all that any one could demand.

In our various articles on the inverse duplex arrangement of the neutrodyne

system, we spoke of the unfortunate habit of the neutroformer coils to feed back energy into the loop aerial and thus cause a howl which made it impossible to turn the loop throughout the entire range of 360 degrees. In other words, when it was necessary to turn the loop in a certain direction for a certain station, it was often found that the loop in this position would get the feed back from the neutroformer coils and the howl would drown the signals.

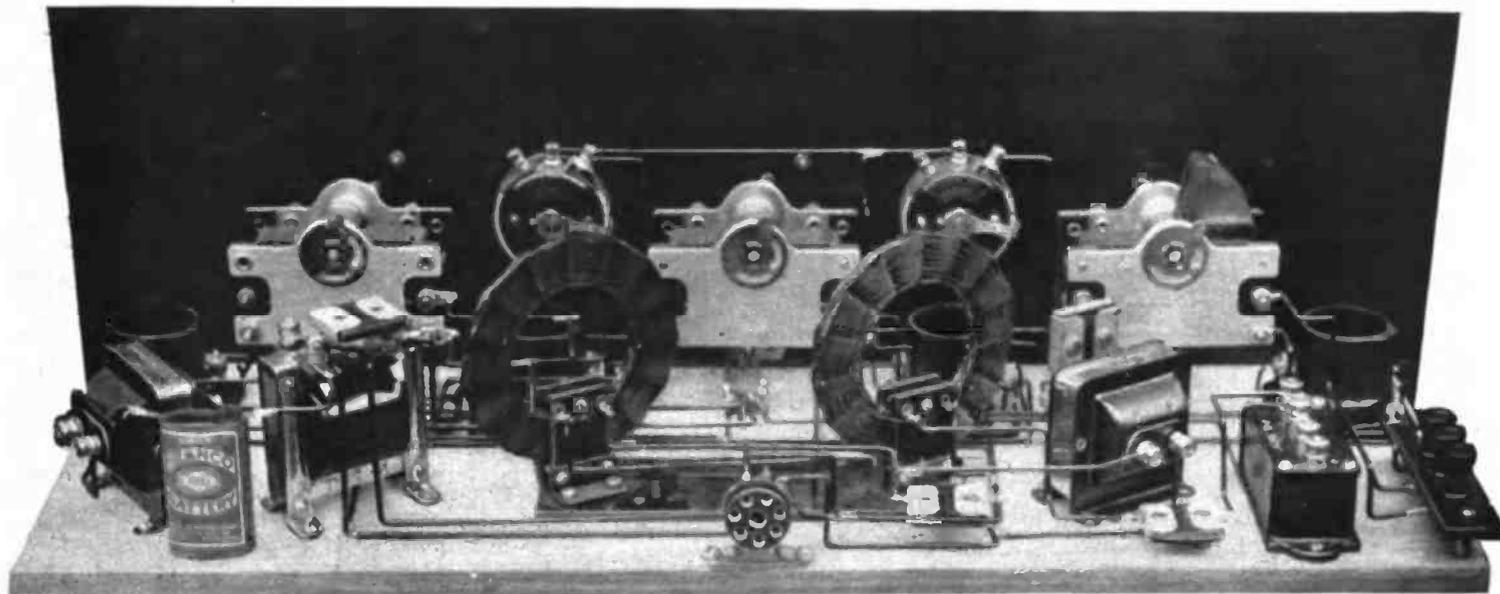
I said in former articles that I thought this tendency could be overcome if we adapted virtually the same circuit to the new system of coils just being put on the market in a completed set by Carl Pfanstiehl under the commercial title of the Pfanstiehl Model 7. This Model 7, after long use at Delanco, proved so unusual in

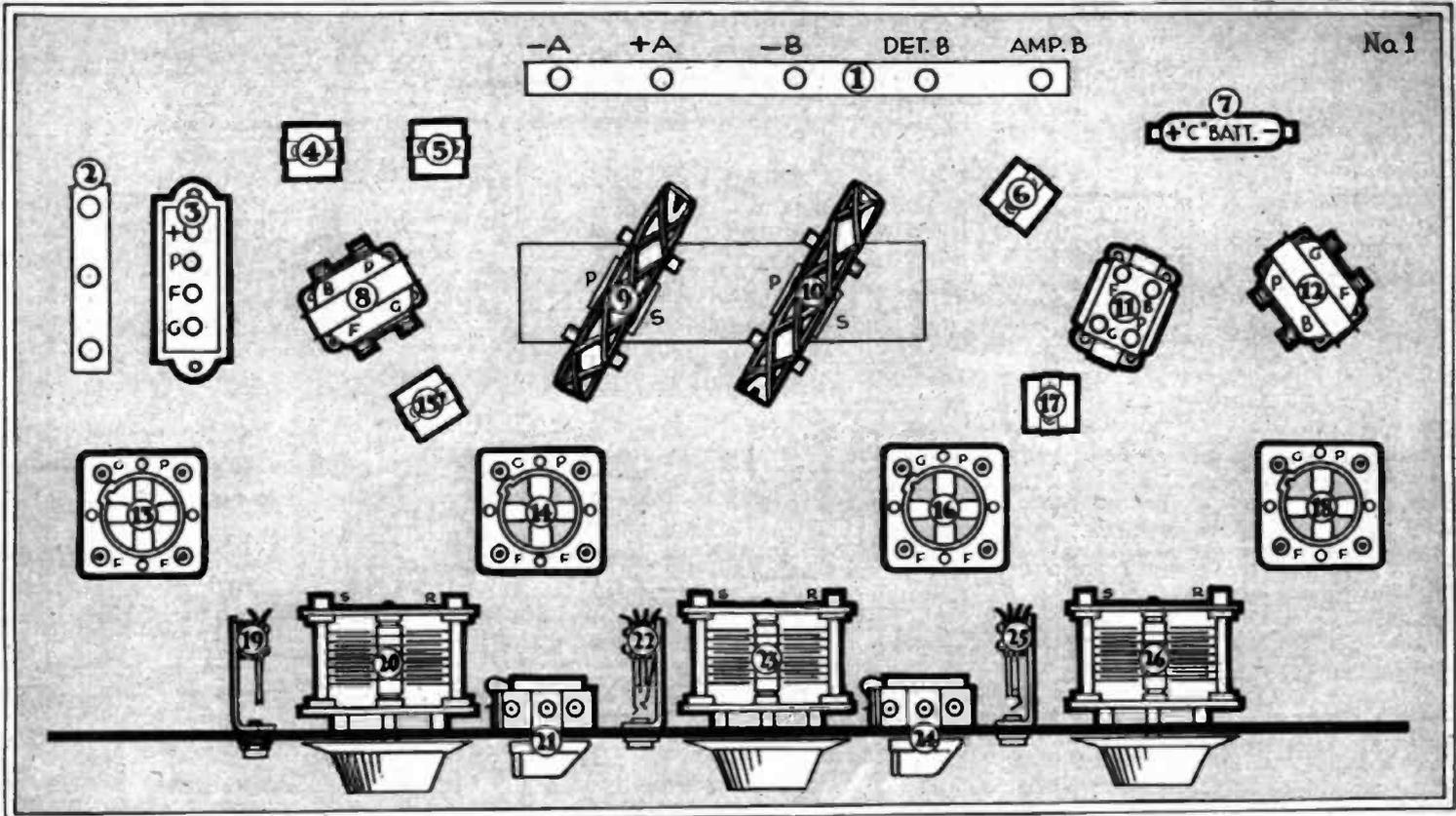
beautiful quality that I felt that its fundamental system, modified by the inverse duplex for the sake of saving tubes and adapting it to an indoor loop, would be the ultimate solution of the demands which we have had for a set of this kind. Consequently, I had Mr.

Pfanstiehl wind for me two coils according to the specifications which I gave him and these coils have proved to be all that I had hoped for them.

Let me say at the outset that there is no intention at present of putting these two coils, mounted on their insulating strip, widely on the market unless there appears to be genuine demand for them. Mr. Pfanstiehl, has, however, very kindly consented to furnish this unit—with the two coils already mounted at the proper angle on a bakelite strip—to any of the readers of this magazine who want them. He will furnish them through our E. M. Clarke, who for some time past has been doing a free shopping service for the readers of this maga-

*Looking at the set from the rear.*

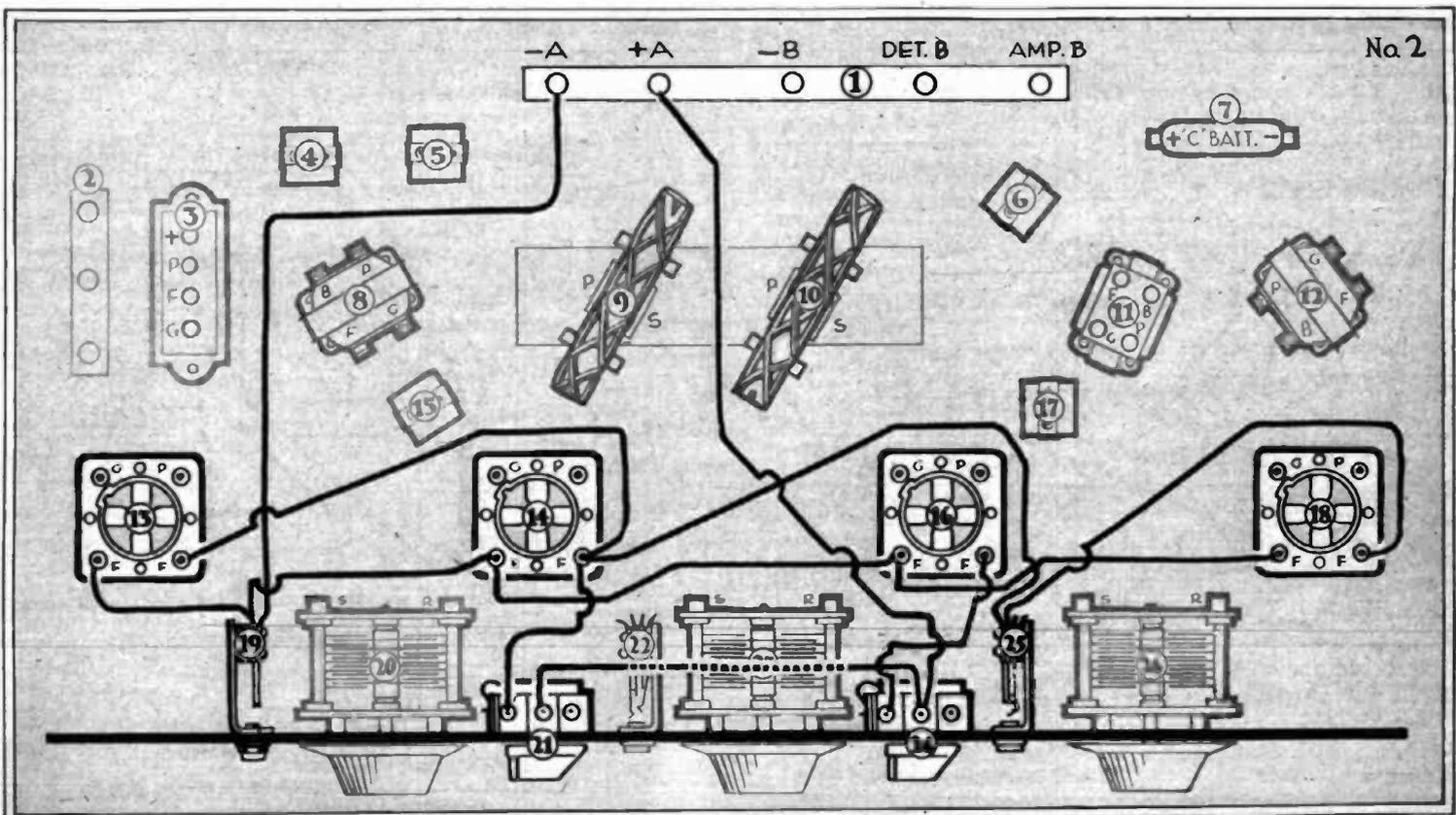


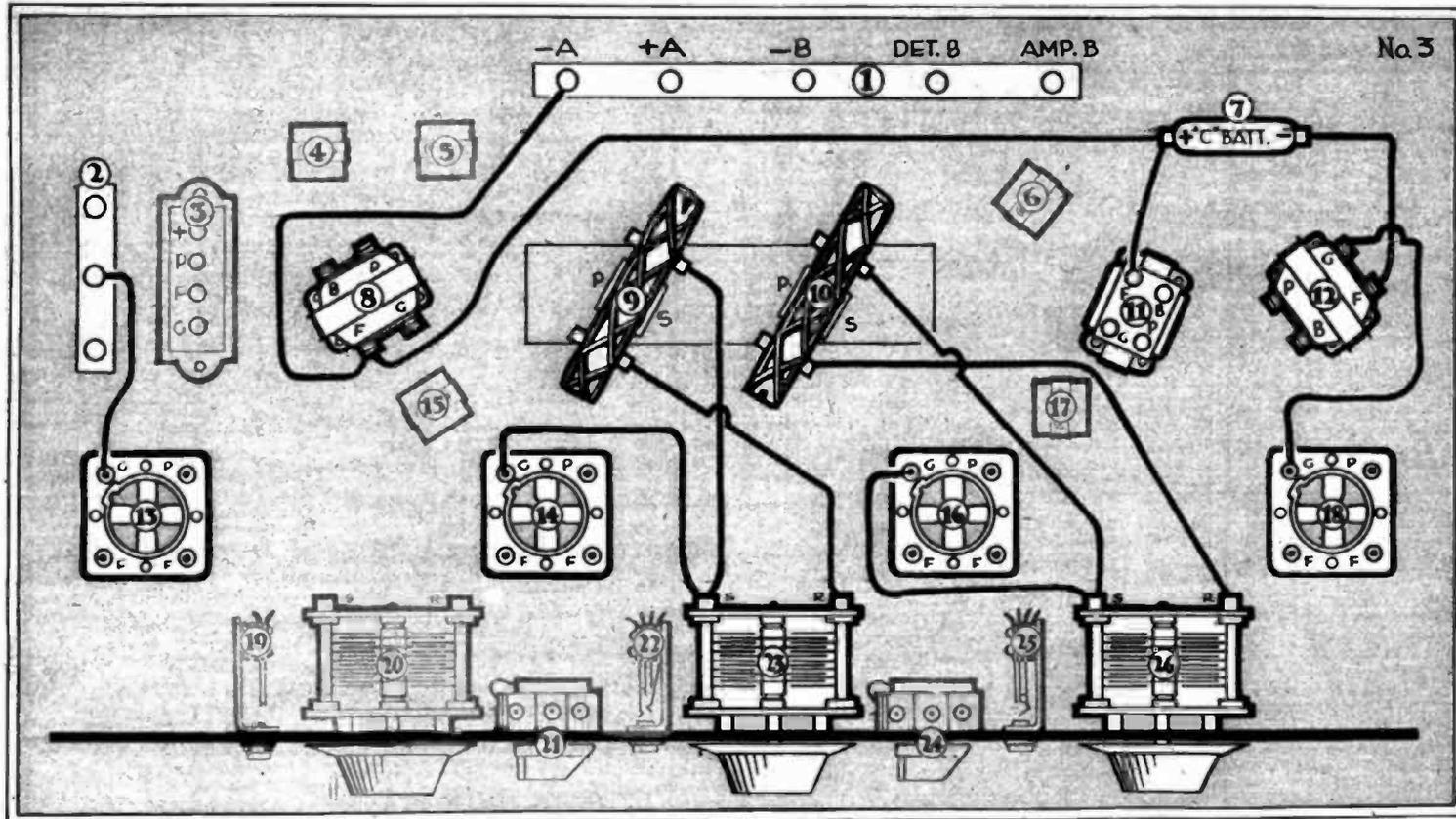


zine and whose advertising is always found in our pages. So, for those of you who wish to try this set for the sake of its beautiful reproduction, let me advise that you get in touch with Mr. Clarke and he will furnish this unit for you. All of the rest of the apparatus is standard and can be bought almost anywhere. If it happens that you live in a small town where the dealers do not carry standard apparatus of this kind, you can also get the rest of the

material from Mr. Clark by writing to him. Those who have built the inverse-duplex neutrodyne and who want to try this hook-up for comparison will find the change very cheap and easy. All they need is the Pfanstiehl coils. This circuit is exactly the same as the former one except that we eliminate the neutrodon condensers and substitute Pfanstiehl coils for the neutroformers. All of the other wiring can stay just as it is in the inverse-duplex neutrodyne. Personally

I very strongly recommend the change. Mr. Pfanstiehl is now wiring for me two more coils with more turns on the primary and I believe these will give the set all the punch of the neutrodyne and still not mar the quality. By the time this article is printed, my tests of these coils will be finished and the coil that proves best will be the one which Mr. Clarke will send you. Let me pause right here to make a little explanation to our readers of certain





features of these hoop-up articles of ours.

Ever since the beginning of this magazine, we have specified by name the makes of parts which we ourselves found worked satisfactorily in our various hook-ups. If the circuit happened to be one which would function with any standard transformer or any standard part of any kind, we so stated. If it happened to be a circuit which depended for successful functioning upon an exact balancing of parts, we went to con-

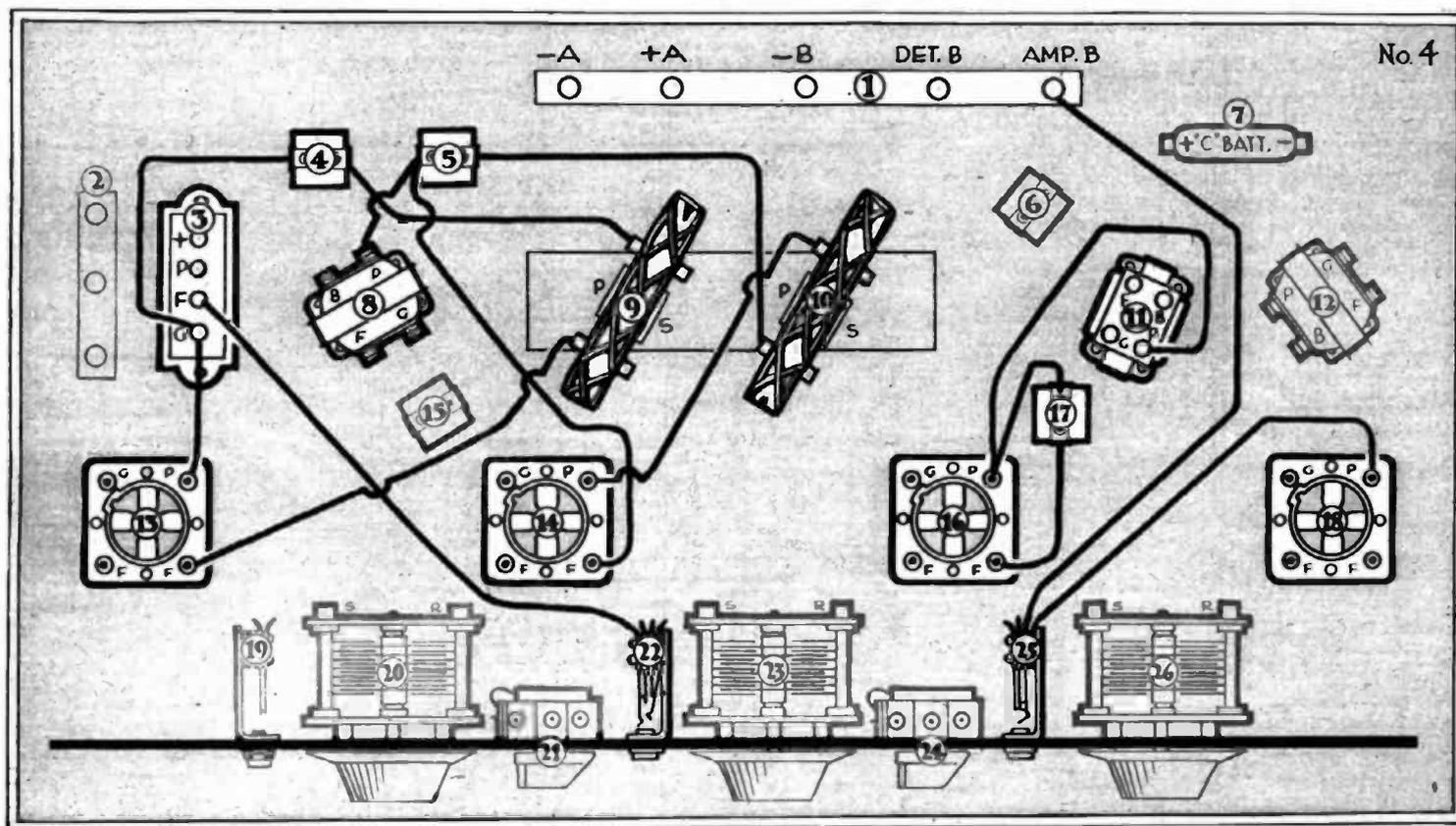
siderable trouble to find the proper material to use to get this exact balance and in those articles we stipulated the particular makes and types of apparatus which gave the results.

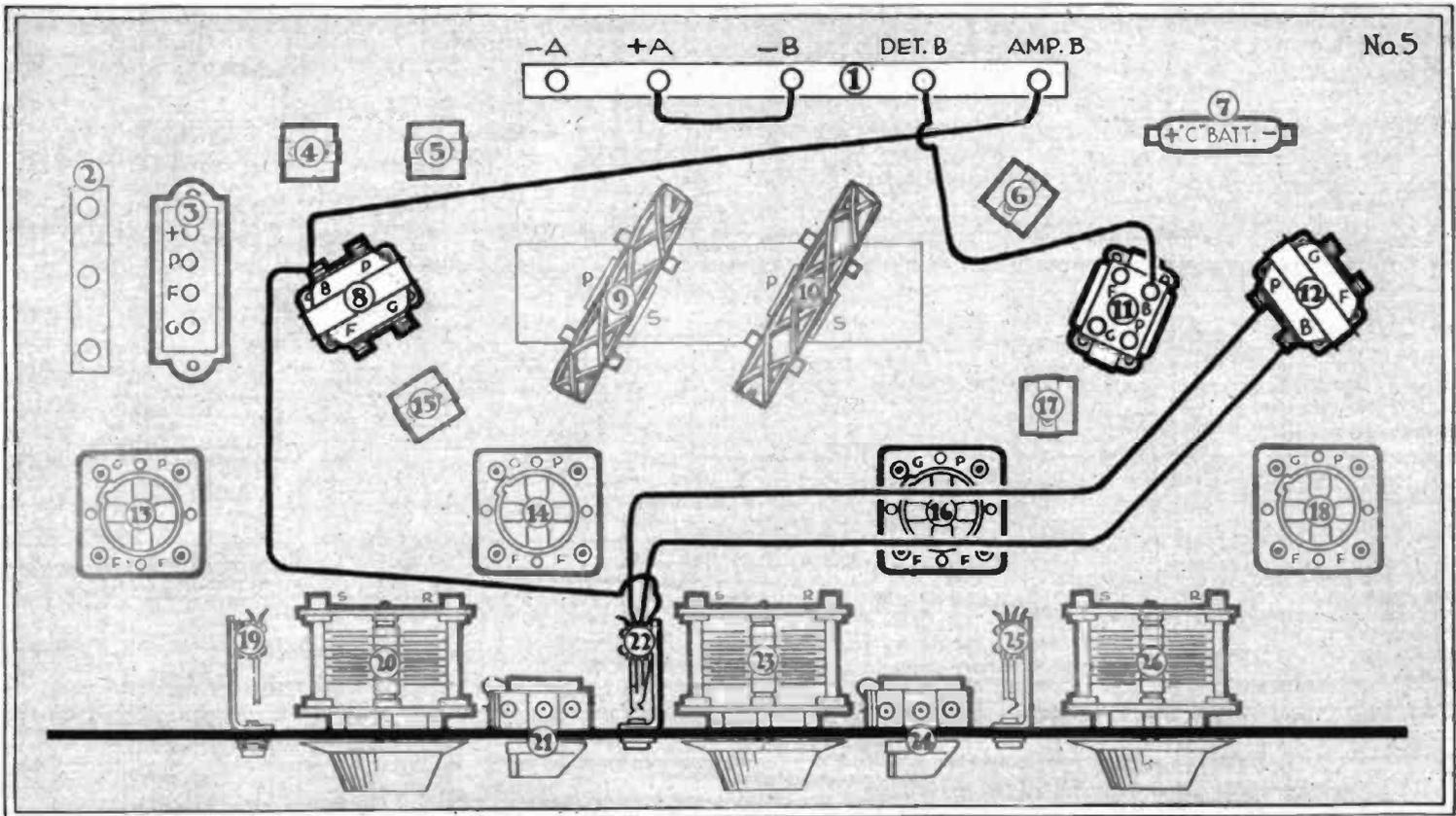
I have now a letter from a reader who wants to know if, speaking honestly, I am not simply "plugging the manufacturer's game."

He refers to my various articles on the inverse duplex system and the fact that I

specify certain types and makes and says that the dealers in the city in which he lives—Providence, R. I.—tell him that any other make will do just as well, and that I am simply trying to make this fan spend more money. Furthermore, he says that the "Amateur League"—whatever they are—are going to take this matter up and that magazine editors like myself will find themselves in trouble.

My reply to him was that if he felt any





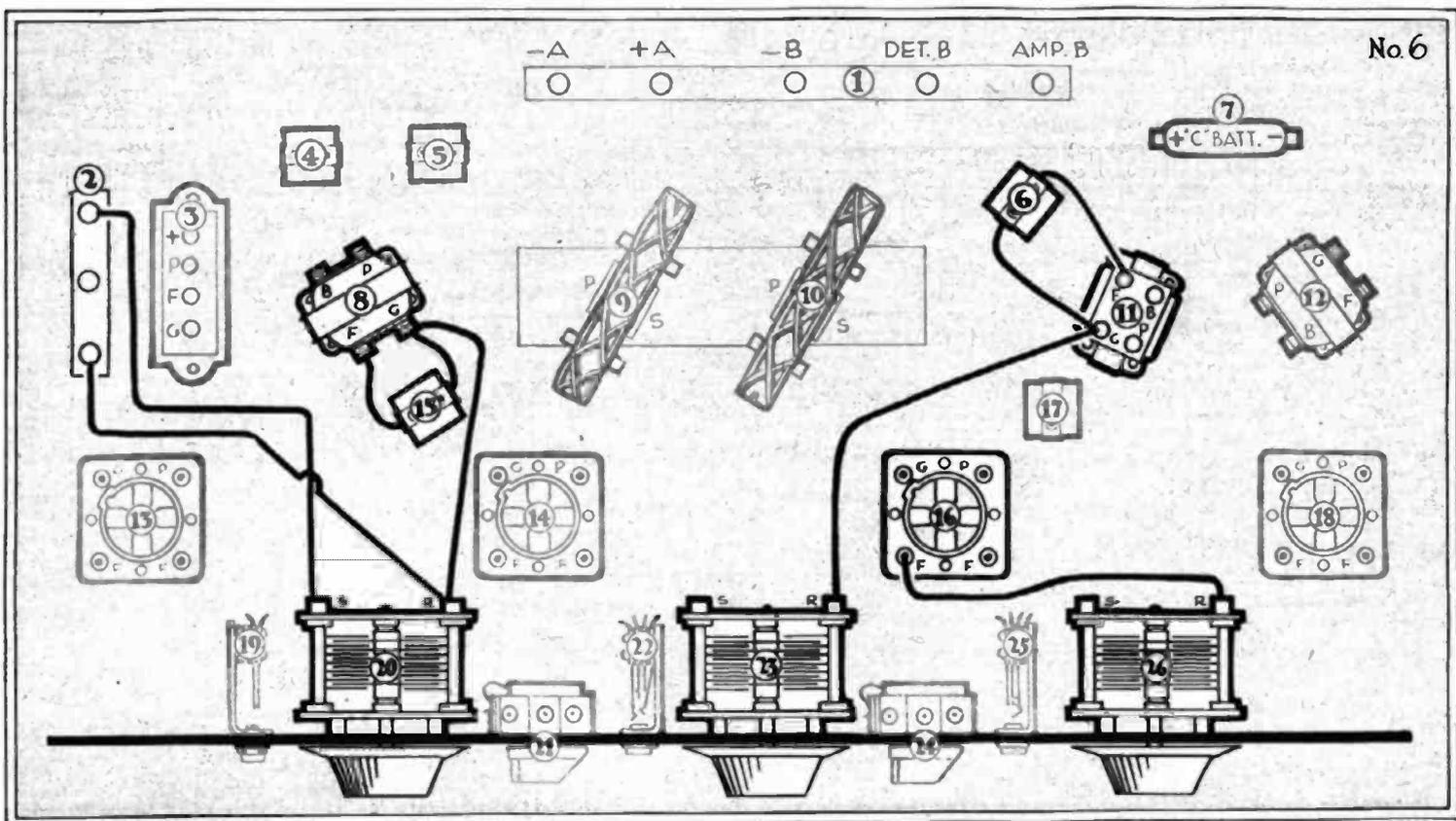
other make of apparatus would give satisfaction in these inverse duplex circuits, all he had to do was to try the circuits with the other makes, and I further said that if the "Amateur Leagues" took any action of this kind, they would succeed only in making a public exhibition of their own ignorance and nothing else.

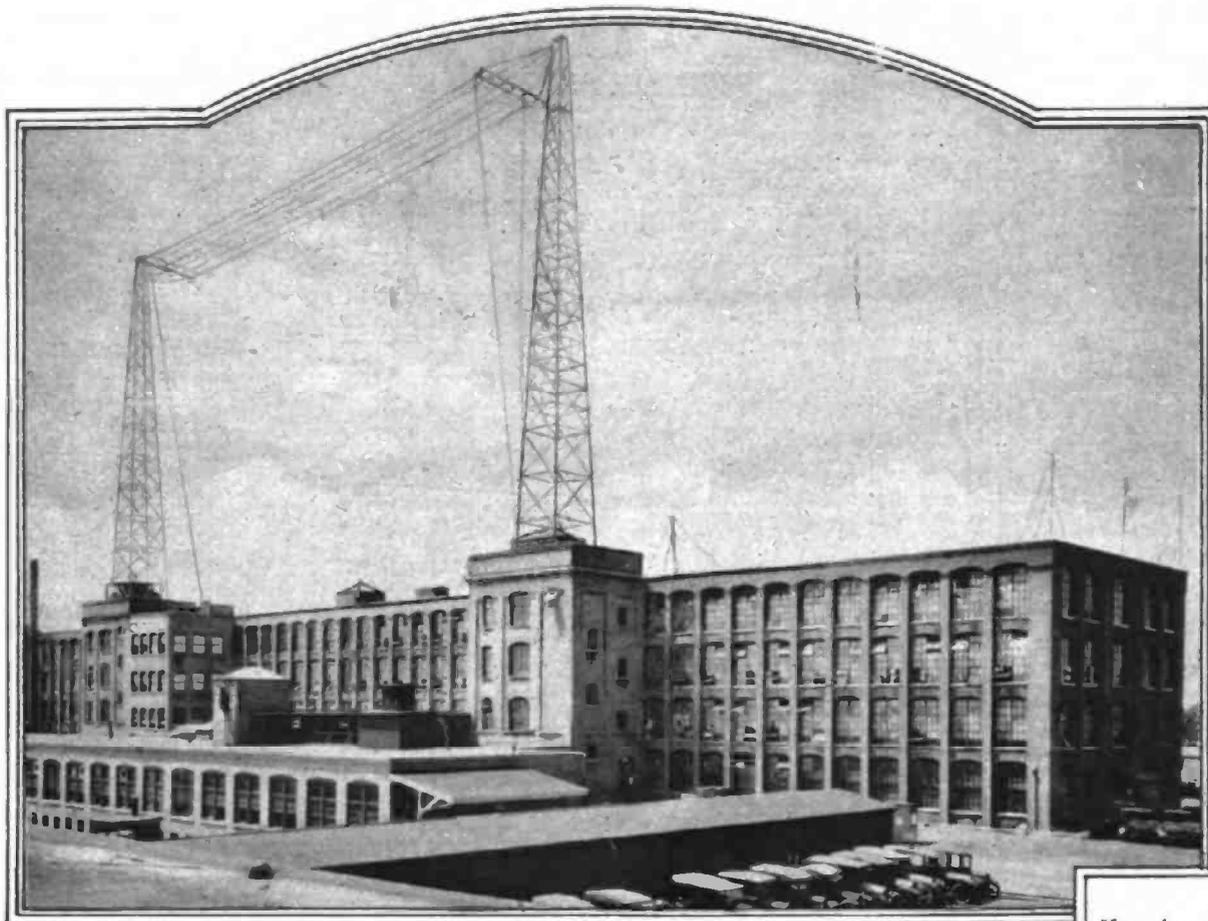
In ordinary circuits, any standard makes of apparatus will work with perfect satisfaction. In the inverse duplex circuit,

however, all of the values of the various by-pass condensers depend absolutely upon the peculiar electrical qualities or "constants" of other apparatus in the circuit and the moment any piece of apparatus is changed, it will be necessary to go through a long and tiring lot of experimentation to find just exactly how the values of various by-pass condensers must be changed to suit.

We do all of this work once at Station

3XP. It means a long and tiring job to find these values because we know of no way they can be figured out on paper. Probably later, when the entire functioning of the inverse duplex system is better known, we will have formulae by which all these things can be figured but at present the only way to reach the successful set is by the long and tiresome process of "cut and try." In all of these circuits, we have specified Jefferson (Continued on Page 46)





Here is a view of the towers and antenna of Station WBZ

## "-This is the Herald Traveler, Westinghouse Studio, Hotel Brunswick, Boston"

By G. P. ALLEN

New England representative of Radio in the Home

YOU all probably have had friends whom you have known for some time, but whom you have never happened to visit because they live out of town. Then—suddenly you have an opportunity to visit them.

You know how it is! The family meets you—the dog appears—they show you over the house; and then follows a visit to the garage and the garden.

I've met WBZ on the air in Florida, Pennsylvania and New England, but have never been able to "run out to the house" until this week. Now, I have a confession to make. The "family" in both Springfield and Boston were so nice to meet, and I became so interested in them that I nearly forgot to "see the house." Before I forget again I'd better take you round. WBZ, the Springfield station of the Westinghouse Electric and Manufacturing Company, is located in East Springfield, Mass. It uses a 1000-watt Westinghouse equipment, transmitting on a wave length of 337 meters, or 890 kilo-cycles. Incidentally, the Associated Press has announced that WBZ has had no appreciable deviation in its transmission from 890 k. c. in two months and that the Government has placed the station on its list of standard wave-length broadcasting stations. The power supply is 440-volt alternating cur-



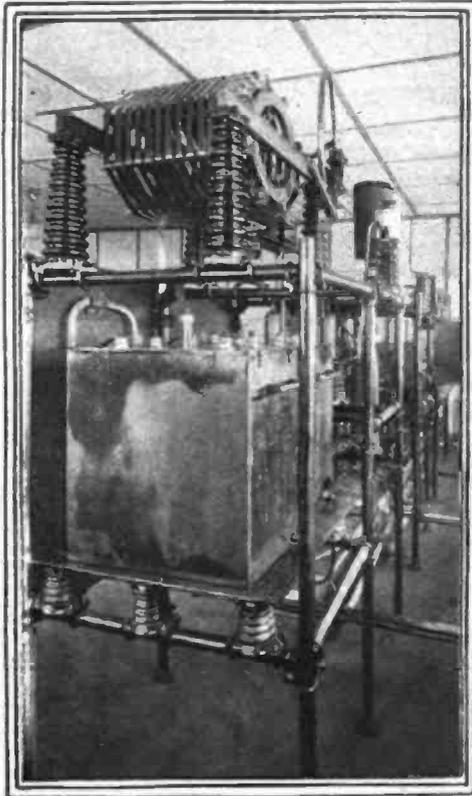
George H. Jaspert, director of Station WBZ

rent from the lines supplying the company's manufacturing plant. The proper operating voltage is obtained by means of step-up transformers. This current is rectified and filtered and is used for both the filament and plate. In the photograph the modulator panel is first, then the oscillator and in the distance the rectifier.

In addition to the East Springfield station, WBZ maintains two permanent remote control stations; one at the Hotel Kimball, Springfield, Mass., and the other, the "Herald-Traveler, Westinghouse Studio, Hotel Brunswick, Boston."

You will notice the absence of drapes in the Hotel Kimball Studio. The walls are of Accousto-Celotex, a combination of flax, cornstalk and seaweed with a binder. It gives a pleasing decorative effect, eliminating echo, and yet avoiding the deadness caused by drapes. In Springfield there are direct lines to the Capitol Theatre, Springfield Auditorium, State Theatre, Poli's Theatre, Court Square Theatre, Springfield Union, two lines to the Hotel Kimball, Cook's Butterfly Dance Palace, Eastern States Exposition, National Institute of Musical Art, Unity Church and South Congregational Church.

Not being satisfied with this effort to please their listeners, WBZ ran a specially



A rear, side view of the powerful transmitting apparatus of the Westinghouse Radio Station, WBZ, at East Springfield, Mass.

To the right is shown a front view of the modern water-cooled transmitting apparatus of Station WBZ

The men behind the gun—the operating staff. From left to right they are—J. L. Ingram, R. F. Blum, H. R. Dyson, J. B. Coleman, engineer in charge, R. P. Haughton and J. E. Graton

built two-wire line, one hundred miles to the Herald-Traveler Westinghouse studio in the Hotel Brunswick, Boston. The Brunswick studio is the first remote control station to be operated regularly over such a long distance. Since the opening of the studio February 25, 1924, not a program has been missed.

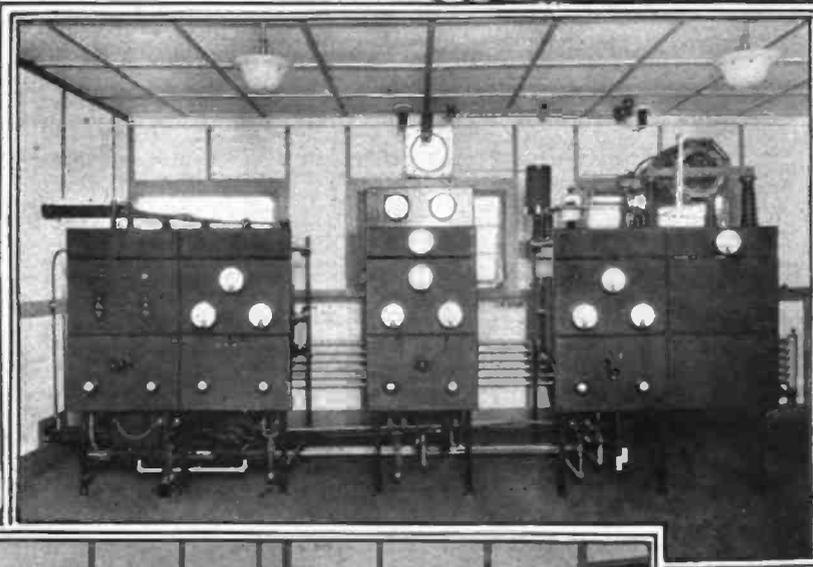
At the Brunswick there are connections to the Boston Arena, Boston Opera House, Chickering Piano, Colonial Theatre, Convention Hall, Copley Plaza Hotel, Estey

Organ Factory, Hotel Lenox, Hume Music Company, Jordan Hall, Keith's Theatre, Majestic Theatre, Mechanics Building, Plymouth Theatre, Selwyn Theatre, Shubert Theatre, St. James Theatre, Steinert Hall, Symphony Hall, Tremont Theatre and the Wilbur Theatre.

Owing to the distance between Springfield and Boston, two separate staffs are required and there is as much detail and work involved as if WBZ were two separate stations. As the expression goes "I believe



An interior view of the studio of Station WBZ

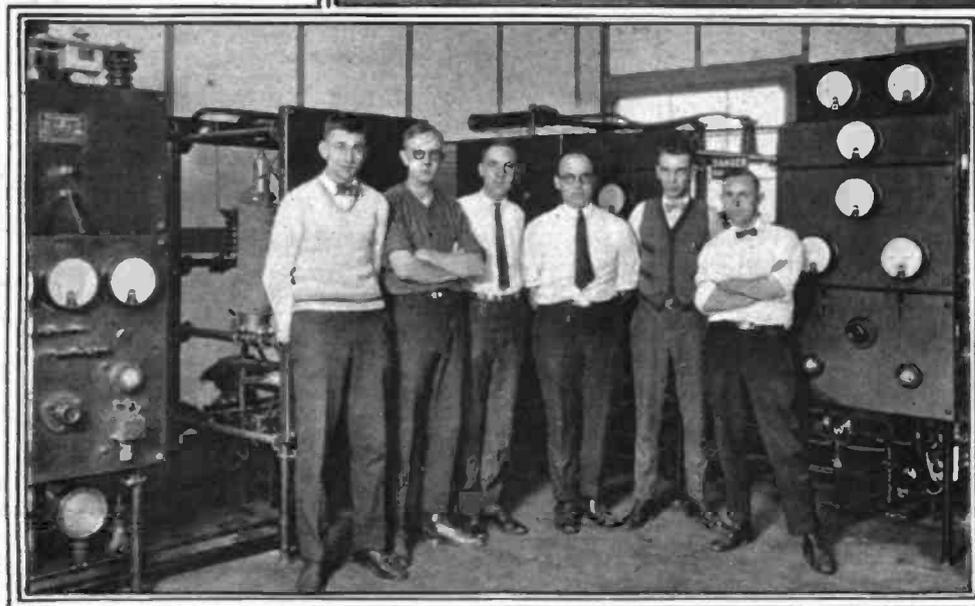


you know," "AEB" or A. E. Bach, "WST," W. S. Tilton, "MCN," T. H. McNally, and "JWS," J. W. Skinner, of the Springfield station. They take their turns announcing.

Of the Boston studio, you have met (on the air) "EFA" or A. F. Edes, the Herald-Traveler representative, and "CMB" or C. M. Burr, the Westinghouse announcer.

Now I want you to meet the others who work for you unheard, and, frequently, unthanked! J. B. Coleman is the engineer in charge; G. H. Jaspert is the station director as well as in charge of publicity in Boston; V. A. Breglio handles the publicity at Springfield. By means of twelve hundred publications, Mr. Jaspert and Mr. Breglio let you know what WBZ is going to do and when they are going to do it. At Springfield, A. S. Eisenmann is the associate director. "EFA," the Herald-Traveler representative, handles the Boston programs. When WBZ is "coming in clear as a bell" remember you have some friends at the station working for you all the time you are listening. John L. Ingram is the chief operator. Helping him at Springfield are—R. F. Bloom, Roger Houghton and H. R. Dyson. At the Kimball is E. G. Graton. P. W. Harrison is in charge of operations at Boston, with P. J. Robinson and G. W. Lang assisting.

At every broadcast outside the studio, in either Springfield or Boston, one of the



assistants is on the job, and they also take their turns at the control board in the studio.

Did you hear the first broadcast of the Aleppo Temple Shrine Band of 216 pieces from Boston? This is what went on that you didn't hear. After the first number—"Pipe down on the drums, they are blasting." Then following the second number—"That's better, a little less banjo now." At the next interval—"Throw in more resistance on the mike." Then "atta boy." With the transmission over, Robinson returned to the studio, and he and Harrison had a discussion about rearranging drapes and other things for the next transmission. Springfield also had its say about what was heard at that end.

In addition to the operating staff, there are two listeners stationed outside during each broadcast. All the announcers have to do on their nights off is park at their sets at home and listen in to be sure that nothing gets by the rest of the staff! It's an



Broadcasting talks at the Kiwanis luncheon, held at the Copley Plaza Hotel, Boston. From left to right they are—Joe Toge, Jackie Coogan, Lieut. Governor Alvan T. Fuller; while in the foreground is A. F. Edes, program director and senior announcer



The corps of announcers. From left to right you see Wm. S. Tilton, "WST"; Thos. H. McNally, "MCN," and Alwyn E. W. Bach, "AEB"



easy life, isn't it? Another example of the efforts of the operating staff toward efficiency is the remarkably short time it takes for WBZ at Springfield to become WBZ at Boston, or vice versa: "You will next hear from the Hotel Kimball studio in Springfield, Mass. This is the Herald-Traveler Westinghouse studio of WBZ, Hotel Brunswick, Boston, signing off." "This



The sound-proof radio studio in the mazzanine floor of the new Hotel Kimball Annex

The WBZ trio, who broadcast selections every Monday, Wednesday and Friday. Violin, Gaitano Misterly, cello, Gustav La Zazzera; piano, Mrs. Elanor Turner Zazzera

is the Hotel Kimball studio of WBZ." Just like that! In less than a second you are hearing a different voice a hundred miles away! In that time the "mike" at Boston has been cut off, the lines at Springfield changed from Boston to the Kimball, the "mike" there cut in, the announcer at Springfield notified and he starts to talk.

One of the first questions I asked at WBZ was: "Has this station any slogan or does it use any distinctive call or instrument?" I was promptly informed that it didn't, and from the manner in which the reply came I gathered that they were surprised I should think one necessary. Whoa! I'm afraid I'm giving (Continued on Page 25)

# How Much of a Nuisance are You?

**N**OW that the cold weather is upon us and we enjoy remaining indoors a little more, that siren of a radio set keeps calling us toward it. We just can't seem to stay away from it, so we are now once more regular patrons of the new season's ethereal stations.

At such a time as this though, one cannot help but draw comparisons between the present radio program status and that existing last spring before the hot weather drove us outdoors to tennis and other things non-radio. They say that absence makes the heart grow fonder, and this may explain the keen enjoyment obtained from many of the better and larger broadcasters. Anyway, a noticeable improvement was apparent both in quality of recording and class of program. A smile of satisfaction is within possibility and we commence to entertain great visions of Radio's future.

As this smile of satisfaction increases and passes even to a pleased grin, it remains on our lips as sort of an anticlimax and then gradually passes away as we sit there with a fixed wild expression of the eyes and the lower jaw drops open like a broken latch. Can it be possible that the thing we "most greatly feared has come upon us"?

It has! A cry of despair escapes from us and nearing a sigh of mourning, we shut off the set.

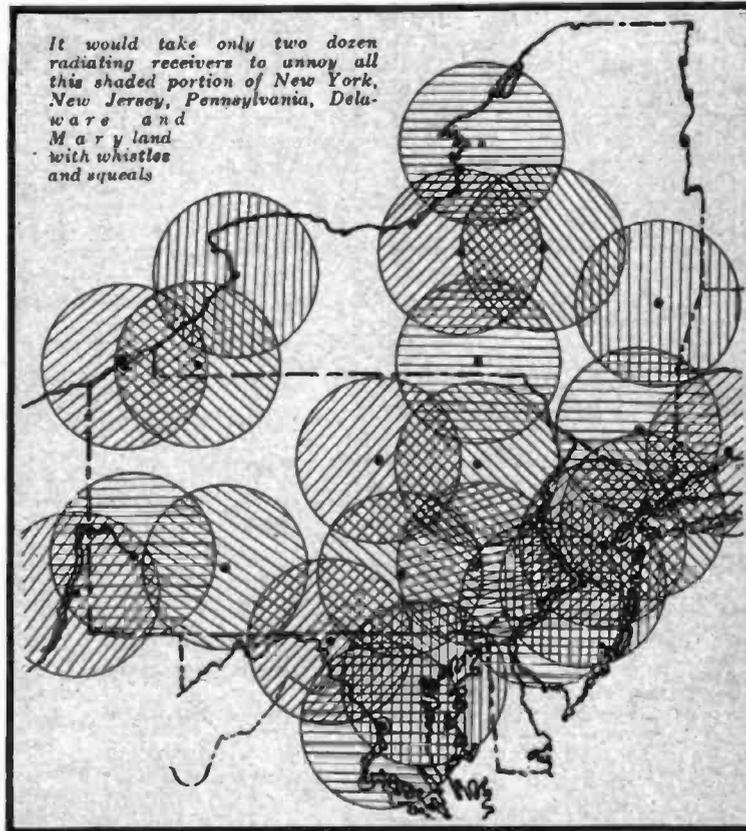
From then on for a few weeks, a considerable number of experiments are conducted with the purpose of obtaining an overwhelming array of concrete evidence on this awful blight on radio. With this data now massed in a formidable phalanx, we sit down to reduce our lamentations to writing.

What is this ever-increasing consuming disease to which radio reception is subject? Maybe you have guessed it already. Yes, you have! You also have been annoyed to exasperation by it. It is the oscillating or radiating receiver. Beyond a shadow of doubt it is ten times worse this season than last—yea, a hundred times worse. In place of the pretty little whistling of the birdies of last fall, we swear that it is now a veritable swampland of loud and weird noises from hill frogs and crickets to screeching bluejays.

One might be tempted to sit back and stand for it as the French did during Europe's recent unpleasantness, saying, "C'est la Guerre"—"it is war," except for the fact that this highly objectionable public nuisance is not at all necessary and it is not inherently a part of radio reception. It does not have to be—and that is the provoking part of it. It seems the very height

By **DAVID GRIMES**

Inventor of the Inverse Duplex System and Associate Editor of "Radio in the Home."



is the type that is shown continually around the country as the new "so and so" circuit for the radio enthusiast to try out. There are probably more of these general kinds of circuits in use than any other. Hence we will discuss it first.

This set, when boosted to oscillation, caused a whistling in the phones of the set when the tuning condenser was passed through a broadcasting station. This was the characteristic regenerative screech starting at a high pitch, gradually descending to a low note, and then passing through to higher notes as the tuning condenser was revolved. It was not particularly objectionable as we listened on the phones of the set doing the oscillating. In fact as we operated it, it appealed to us, as it does to many, as an ideal way to locate a station—by its whistle! And therein lies the danger.

If we had placed two stages of audio amplification after that regenerative detector, the howling in phones or loud speaker would have been most annoying to us. But as it was, it was only the chirp of sweet birdies in our ears and we proceeded to try it on several stations, locating them in each instance by allowing the set to oscillate and create the

of unfairness when some one with a cheap little inexpensive receiving set can disturb the reception on literally hundreds of high-priced elaborate outfits.

There has been a general tendency in the past to excuse these molesters of the ether, or else to wait complacently by until a little of its racket subsided. Such a policy is suicidal as proven by the situation this season. Things have not been rectifying themselves. They have been going from bad to worse.

You may say that it is because we live near a large city that we are so disturbed and that, at its worst, the poor little radiating receiver, only annoys the next-door neighbor. We ourselves have often blamed the fellow "just down the block" for some of radio's atrocities. It was with this thought in mind that the series of tests were conducted. It was to determine just how much of a public nuisance you—with an oscillating receiver—really are! The results were rather astounding.

In order to make doubly sure of the "dope" we ran the tests in co-operation with Boyd Phelps, a well-known amateur operating Station 2EB, on Staten Island. Phelps formerly ran Station 9XT in Minneapolis and was assistant editor of "QST" for a time. Well, we rigged up first an ordinary single circuit regenerative receiver with tickler coil such as shown in Figure I. This

familiar whistlings. But what was happening two blocks down the street? We had several types of receivers down there to gauge the amount of interference, so we left one of the groups to cause the disturbance while the rest of us betook ourselves thither. We first listened with a set exactly similar to the first one shown in Fig. 1. Of course, we clearly heard the heterodyning whistles of set No. 1, although the volume was not annoying—it was the sweet birdies again. Then two stages of audio amplification were placed after our new receiving set. This amplified the whistling to such a degree that it was highly objectionable and a third audio stage drove us out of the house. Other types of multi-tube sets employing audio amplification for loud speaker work, produced the same extreme annoyance caused by set No. 1.

Inspection led us to make a move more distant than merely two city blocks from set No. 1, and according, an ordinary broadcast receiving installation using regenerative detector and two stages erected five miles away, was found to be still considerably disturbed by our oscillating set No. 1. A damaging discovery to say the least! Set No. 1 was not objectionable at all unless the audio stages were employed. At ten miles' distance, our disturber had practically disappeared even on head phones with the two audio stages. It was exceedingly diffi-

cult to detect our special interrupted oscillating set No. 1, mainly due to almost innumerable other squealing sets nearer to us. If we could have had a "quiet ether," the disturbance might still have been very plain at ten miles.

Fairly well satisfied with these tests, we proceeded to "blow-up" the three-circuit fallacy. We had often heard that "of course the radiation from a single-circuit receiver was bad, but that a three-circuit receiver will eliminate this." So, accordingly, a new

the day when more people know how to build a nonoscillating radio frequency amplifier!

The previous tests made with oscillating detector tubes having 22½-volt plate battery, astounding as they were, faded into dim nothing as compared with the results obtained with a first-class, rip roaring regenerative radio frequency amplifier. The ninety volts of plate battery instead of the 22½ probably accounts for the increased annoyance over much greater distances. All of the phenomenon is not quite clearly understood, as yet, as complete data has not been tabulated. On the receiving set No. 2 installed two blocks from the oscillating radio fre-

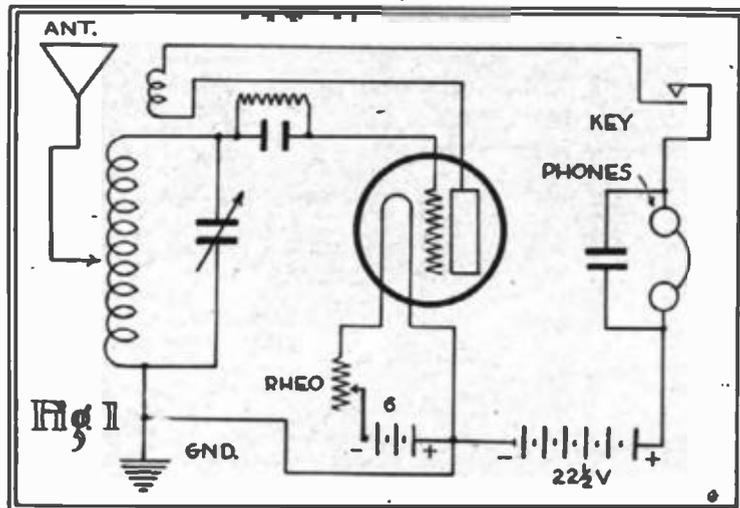
der why England, France, Japan, Australia and other countries have prohibited by law, the use of a radio receiving set that creates oscillations in the antenna circuit. Something has got to be done on this distressing situation or radio will receive, even as it is now receiving, a severe setback. It is no one person's job—it belongs to all of us!

And if there were any excuse for such radio sets, it would be different. They can be made and are being made greatly to minimize this nuisance. Don't rest secure that you are not a public nuisance because you have a stage of radio amplification ahead of your regenerative detector—it may be poorly designed, causing oscillations ten times more objectionable than the detector alone originally was! Snap out of it in a hurry or every one's programs will be continually ruined.

And how are we to start to clear the air of "bedlam"? First, it must be recognized as a howling crime for anyone to build or any manufacturer to sell a straight oscillating receiver. Every radio listener within at least five miles of such a set is the victim. Second, it must be recognized as a howling crime for anyone to build or any manufacturer to sell an oscillating radio frequency receiver. Every radio listener within at least fifty miles of such a set is the victim. Third, steps should be immediately taken to

enact proper laws to force the selfish ones in the above groups to play the game fairly as has been found necessary in Europe, Asia and Australia.

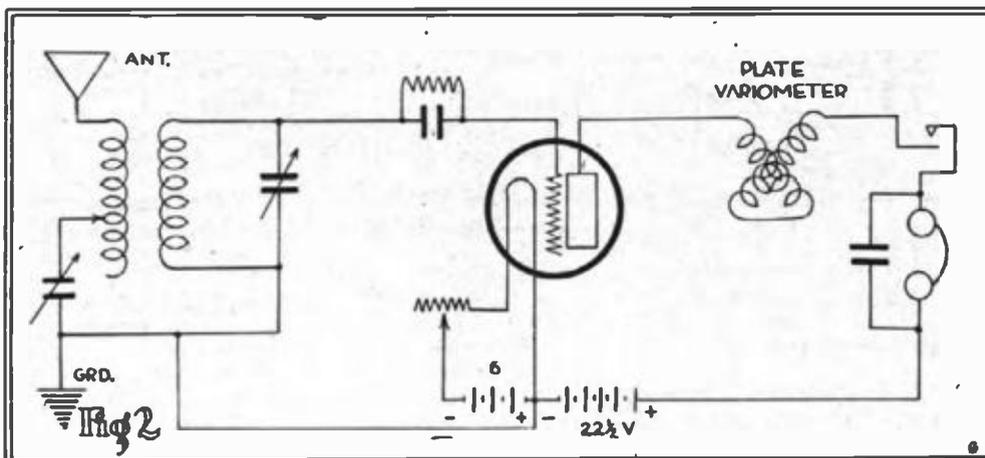
All of this would seem like a cruel, hard move against some manufacturers, but it isn't. The nonoscillating radio frequency patent is owned by our U. S. Navy and is available to all. It is not the special



disturbing set was installed and operated in place of Fig. 1. The three-circuit set installed is shown in Fig. 2. This gives us a tuned aerial, a tuned grid and a tuned plate circuit.

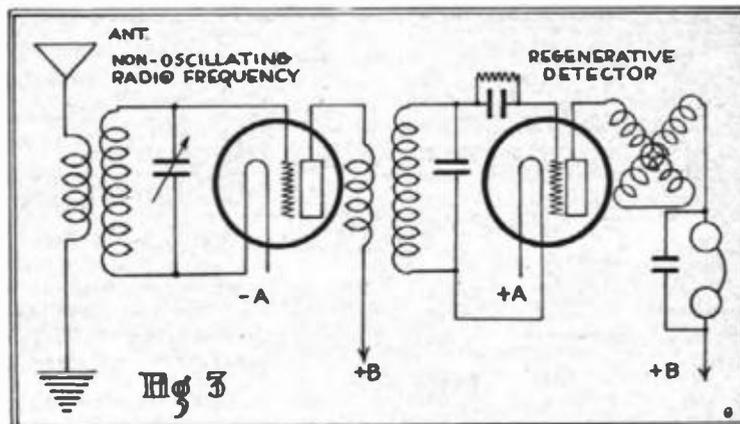
Going back to the original listening post only two blocks away from set No. 2, but slight improvement was noticed. It was so slight indeed as to be hardly detectable—the oscillation whistles on the three-tube test receiver still being most exasperating. At the five- and ten-mile stations, it was the general opinion that the improvement, if any, was not worth considering. So, if there be any of you who still think that simply because you have a three-circuit tuner, you are not an absolute nuisance, let it merely be published and known that you are only quieting your conscience and not adding one particle of tranquillity to the already turbulent ether.

Of course, most of this is common information among radio manufacturers and considerable credit is due the regenerative set producers in that they have conscientiously tried to reduce this inherent defect in the system of reception. As a result, we now see most of the modern regenerative sets made with a stage of radio frequency amplification separating the oscillating detector from the aerial. It can be said in all fairness that if this stage of radio frequency amplification is so built as always to remain as pure radio amplification rather than a regenerative combination, the ugly action of the oscillating detector tube is somewhat screened. The set is nowhere near as bad a disturber of the public peace. But, oh for



quency model, the whistling appeared to be quieter and smoother than when the oscillating detector set was employed. This might be explained by the absence of a grid condenser and leak in the radio tubes. However, it was found to be about as disturbing five miles away as at the nearby test station. At ten miles, it was still going strong and to cap the climax, we ran 130 volts on the plate and communicated by telegraph with an amateur in Pennsylvania about 100 miles away.

Just think that over, and then dare won-



privilege of anyone. While regeneration may give increased power to your set, the days when automobiles were built with muffler cut-outs are forever over. The resulting noise and public disturbance forbid the use of the slight increase in power when the muffler is removed or garden-variety regeneration is employed.

# Every Kansas Farmstead Can be a College Classroom



**F**ORTY radio courses, embodying the essentials of that number of college subjects of especial interest to farmers, will be broadcast throughout this school year from the Kansas State Agricultural College, Manhattan, Kansas, the first institution in the world to offer a regular course of systematic instruction by radio.

KSAC are the call letters of the new 500-watt station now under construction on the college campus. The programs will be broadcast on a wave length of 341 meters. School will start promptly at 7:20 each week-night evening.

An attractive radio college catalog which lists and describes subjects offered in agriculture, engineering, home economics and general science is being distributed free by the extension division of the college.

The elaborate program launched by the college this year is the result of a successful experiment conducted along similar lines last winter. A ten weeks' "College of the Air" program



The living room of Walter Parrick's home near Riley, Kansas. On the sofa sit Grandpa and Grandma Baird. In easy chairs are Mother Parrick and the baby and young Audrey. The family regularly "attends" the college of the air classes in their homes

**I**F RADIO is the ideal home companion for any one class of people, that class is certainly found on the farms of this country.

Time was when life on the farm in the winter time was dreary almost beyond endurance. Then the isolation of the farm was somewhat lessened by the automobile, the telephone, the rural mail delivery and the suburban trolley car.

Even with these, the isolation has proved too much for the younger generation—and we hear the cry, "How can we keep the young folks on the farm?"

Youth wants to know; youth has an active mind that reaches out and demands contact with the latest events of the day. On the farm, it has never been able to get this contact.

Now comes radio and brings this contact directly into the living room of the farmhouse no matter where it is situated.

Several broadcasting stations are now specializing in programs intended for the farm, and it seems to me that these experiments are among the most important for the future of the radio industry. The Kansas State Agricultural College has gone a step farther than any other station, and I am very glad to present to our readers this outline of the work which will be done this winter by station "KSAC."

H. M. N.

broadcast from a neighboring station by remote control last winter was attended by more than 1000 regularly enrolled students. Half of this number took examinations over their radio work and were granted certificates.

**T**HE ambition and a radio receiving set. Those are the only two prerequisites for attaining a college education via the ether.

An innovation a few months ago, "The College of the Air" instituted by Kansas State Agricultural College, now assumes the proportions and solidity of an established agency in modern education.

The seasoned radiophan, weary of jazz and bored by the pastime of logging distant stations, may now turn the dial to 341 meters and "sit in" with several thousand fellow classmates on a choice of forty college courses.

The new ultra-modern 500-watt Western Electric broadcasting station on the Kansas State Agricultural College campus is considered far from a plaything by H. Umberger, Director of Extension Service. It is his idea to give to the radio public just as much of the most practical phase of a college education as will lend itself to being radiocast. Every department in the five large divisions of the college has enthusiastically rallied to his call for "the best that you have."

The Kansas State Agriculture College is the first institution in the world to harness radio as a means of disseminating a systematic course in instruction. The ten weeks' short course conducted last winter as an experiment was heralded from coast to coast as a triumph. Congratulatory letters from every State in the Union were received by the college officials. Certificates of graduation were awarded for the successful completion of 1500 courses by regularly enrolled "College of the Air" students.

The far-famed "College of the Air" conducted last winter furnished ample ex-

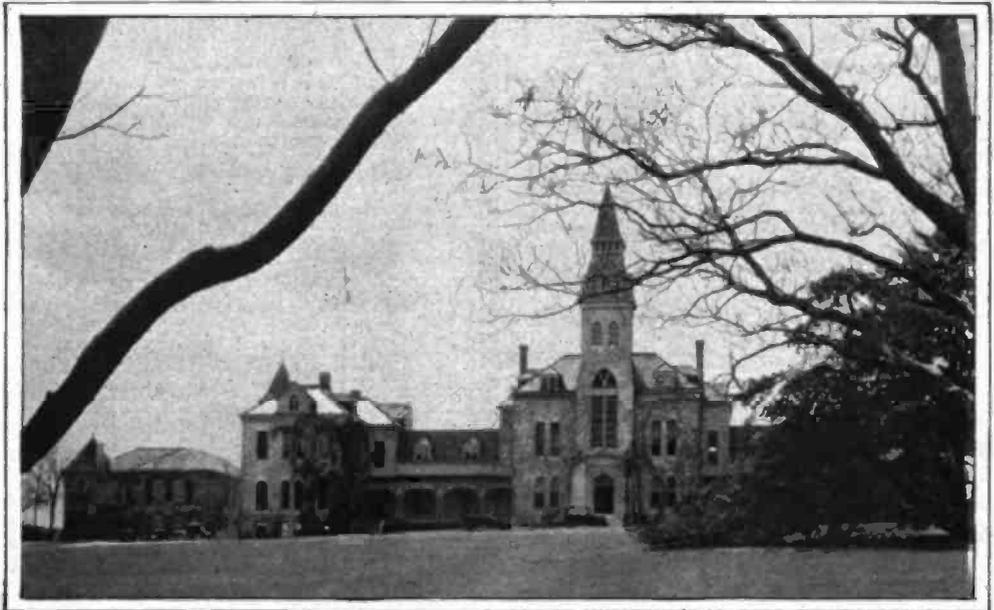
perimental data to erase all doubt from the minds of the college officials regarding the practicability of radio as an efficient means of education. Again this fall and winter the nation literally becomes a campus of the agricultural college.

Picture a family—a million families. Fathers, mothers and youth of a nation. Perhaps the day has been spent at tiresome and not too interesting work. Now it's evening. A Friday evening. Seventy-two, to be exact.

The living-room light casts its glow over the family circle. There is an atmosphere of keen anticipation. Father touches a match to a well-seasoned "hod" and relaxes.

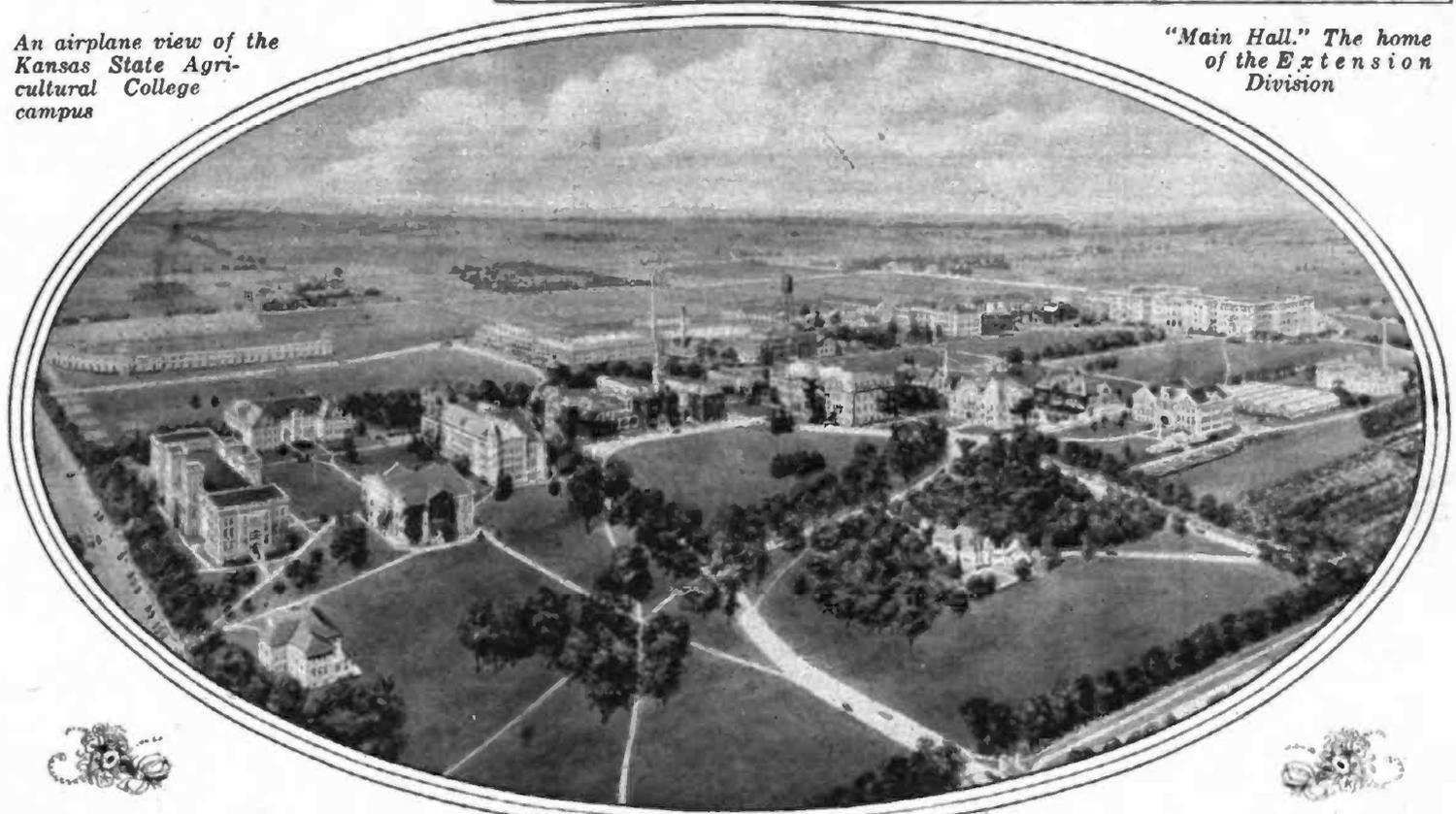
His has been a life of strenuous work from early childhood. Just enough schooling to whet an appetite for a good education and then the urge for more bread winners.

He has provided his own large family with the necessities. There has been no



"Main Hall." The home of the Extension Division

An airplane view of the Kansas State Agricultural College campus



surplus, however, with which to materialize his life-long desire of better education for his children. For them, too, college must be a Mecca always in the distance.

That depressed feeling has vanished now. What great difference did it really make whether those plastic young brains of ambitious youth be impressed with knowledge flung through a thousand miles of ether or across the space of a classroom?

At least, the oldest lad had ceased discussing choice of careers and had written to an agricultural college for a job that would put him through a course in animal husbandry. His determination for a regular college course had been a positive thing after he had followed for ten weeks a series of inspiring, instructive lectures in livestock production. The other boys were

Left—Exterior view of the Engineering Building



*"College of the Air" class composed of High School students, "listening in" to a lecture in the rooms of the Garden City, Kansas, Chamber of Commerce*

interested in general science and engineering. Perhaps they likewise would make decisive selections and have the necessary determination to crystallize their plans. That is the stamina it takes nowadays to develop real leaders. At any rate it was "great stuff" for them. Every evening the whole family was there at home, listening to just as good talks as could be given on subjects which seemed to have been chosen to interest his own family. On last Monday night, Prof. Barnett's lecture on fruit and vegetable gardening had made him want to get the back yard in young, growing things. He believed he would set out a strawberry bed and some cherry trees, too, next spring. Those talks on truck would certainly be worth something to a fellow that made his living that way.

And then that lecture on legumes. He had never known that clovers and certain other crops took the highest-priced fertilizer elements from the air and put it in the soil, an average of ten dollars' worth to the acre. Guessed he'd have to write his brother, Jim, a few suggestions: tell him to grow some sweet clover on those old limestone hills instead of sumac.

Then on Tuesday night the dairyman has said something about pasturing four cows on an acre of sweet clover. That was about all Jim could run on forty acres. If Jim just had a radio and heard that college dairyman Fitch tell about culling out the boarders, he'd soon stop running a "poor farm" for cows.

And say, wouldn't those poultry talks be worth real money to anybody who had chickens! They were even interesting to a fellow who had to buy eggs. Imagine how many people spent time and feed on hens that laid about as many eggs as a crow, and those when eggs were dirt cheap. It



*President Wm. M. Jardine believes radio a vital factor in the economic and intellectual life of the farmer and that the force it will play in the future is beyond calculation*

was perfectly reasonable, paying a few cents more for hatching stock from flocks that produced 200 eggs a year. That idea of feeding the hen the materials it took to make eggs was sensible, too. How many people knew that there was such a thing as vitamins and that a deficiency of any one element in the hen's or cow's ration would stop its manufacturing output? That kind of information was going to help a lot of people make farming pay.

Odd, about that chemistry course. Fascinating subject. Something very scientific and uninteresting they had thought until Prof. Hughes had pointed out that every man, woman and child is a chemist; that our bodies and everything about us are made up of chemical substances; that every act of everyday life is caused and controlled by chemical changes; that our bodies produce the energy to carry out those

acts by burning chemical substances. Acquiring this knowledge of chemistry was like switching on a strong light in a dark room, illuminating the mysterious surroundings.

Yes, those lectures were "great stuff." Stimulating. Made one glad he was living in the Radio Age.

Then those subjects of entomology, microbiology, botany and zoology. How little people really knew about those things which play such an important part in life. Interesting, they had been, too. Just a good assortment of the practical college courses. That's what it was. Business English,

law, education, public speaking! How many thousand families like his own were enjoying and profiting by those evening visits with college professors.

Those engineering talks on Wednesday nights were right along his line. The boss had pricked up his ears this very noon when he had heard him telling another workman about some new scientific development in architecture. Perhaps he still had a

"What's that son? Music? Didn't hear it. College orchestra been



*Sam Pickard, extension editor and radio program director, who conceived the idea and developed the plan of conducting a "College of the Air"*

playing for ten minutes? Well, well. Guess I was doing a little day dreaming. What's the pro. \* \* \* ?

"This is Radio Station KSAC, the Kansas State Agricultural College, Manhattan, Kan., broadcasting its regular 'College of the Air' program. The first lecture tonight is entitled 'The Characteristics of an Effective Business Letter,' by Prof. H. W. Davis, head of the College English Department. He will be followed by Dr. Howard T. Hill, head of the Public Speaking Department.

"For the benefit of those who are listening in the college program for the first time, I wish to make the following announcements:

"The first college catalog in the world offering prospective students college courses by radio has been published by the Extension Division of the college. Half a hundred radio extension courses, ranging

after that lecture is given. This year's extension program offers the American radio-phan a careful selection of the more practical courses available at the Kansas State Agricultural College. Each fifteen-minute lecture is a digest of several longer, more detailed classroom lectures.

"Business men have a selection of short courses in commercial law, public speaking, business English, advertising and other subjects. The housewife has her choice of



Miss Amy Kelly, head of Home Demonstration work in Kansas, has charge of the Thursday nights' program, which is "especially for the ladies"



H. Umberger, director of Extension Service in Kansas, eagerly grasped radio as an efficient, expedient and effective means of facilitating his job of making the State of Kansas the Kansas State Agricultural College campus

Prof. Otis I. Gruber, accompanied by Boud Ringo

eight courses on such subjects as infant care, millinery, household management and nutrition. General science subjects, such as chemistry, entomology, zoology and bacteriology, occupy an important place on the program.

"Courses in business English, presented by Prof. H. W. Davis, head of the English Department, point out characteristics of methods employed in the composition of business letters, circulars and advertising. Specific problems are proposed and solved in a direct, definite way. There is a discussion of the psychology of salesmanship in advertising. The

(Continued on Page 42)



Prof. L. E. Call, head of Agronomy work at the college. His crops and soils lectures inspire many letters of commendation

from eight to sixteen weeks in length, covering the fields of agriculture, engineering, general science, home economics and commerce, are catalogued and described in this attractive booklet which the college sends upon request to any one in the United States, Canada or Mexico.

"The second series of 'College of the Air' courses starts November 10. Lectures to be broadcast are prepared in advance in order that they may be printed and mailed with supplementary instruction to all regularly enrolled students



# The Dawn of a New Day for the Blind



*Radio meant so much that it appeared on the horizon as the dawn of a new day, the coming of a new-found sense*

**T**HEY had saved up \$6000 during their married life—something for their old age. For the time was coming, and soon, when John, who was a Brooklyn fireman, would be pensioned by the city and permitted to ease off the balance of his days without the gray terror appearing at the door. They had raised a large family and lived frugally—in fact, like most people who indulge in personal frugality over a number of years, they had allowed the habit to become their master and the main driving force in their lives.

It is a sad story, but nevertheless all too true. Following her pursuit in life, Mrs. John from time to time visited the ten-cent stores. On one of these occasions she saw a sign, "Fit yourself with glasses—save the oculist's charge." Trying on a pair, the fireman's wife found that they enabled her to see the print of a newspaper much better. That was fine—she bought them and was delighted with her most economical purchase.

Three weeks went by; then the shopping bee once more directed her to the ten-cent store. To the spectacle counter she forthwith went. Maybe she could find a pair that would magnify the print even

By **ALFRED M. CADDELL**

Secretary of the American Radio Association

more. Why, most certainly she could—and did. Purchase No. 2. More delight in reading the newspapers. But somehow or other she noticed that the glasses "lost their strength." Or maybe she had not chosen the right pair from out of the counter lot.

Back to the store for the third time; the fourth, the fifth, the sixth—thank heaven, the last. But the damage to that sensitive organ known as the eye had been done. The pressed pieces of window glass had magnified, but hardly could correct any fault of vision. This magnification relieved the delicate muscles in the eye of their work. The crystalline lens, directly behind the pupil, with nothing more to do, had atrophied and in its place a cataract had commenced to form.

That was less than a year ago. Mrs. John is totally blind now. Rushing from one doctor to another, her husband offered

home where two white-haired heads silhouette against the fading twilight. Fireman John will greet you, and then you will notice seated before what used to be her sewing table the wife and mother who has lost her sight. Seated there as of yore, but instead of sitting idly now, exhibiting a fullness of life.

For, nestled in the white locks of her hair, you will notice a pair of earphones, and you will see a small radio receiver within tuning-in distance of her hand.

The blind woman has joined the ever-increasing army of radio fans.

If ever radio meant anything to any class or group of people, it certainly makes a tremendous appeal to the blind. The enthusiastic amateur derives education and pleasure from tinkering with new hook-ups. The hardy mariner of the sea finds his bearings and brings help to his side in case of trouble. The lumberjack in the wilds and the farmer in isolated places—each finds joy and comfort in this world-wide popular art. But to the blind—was any

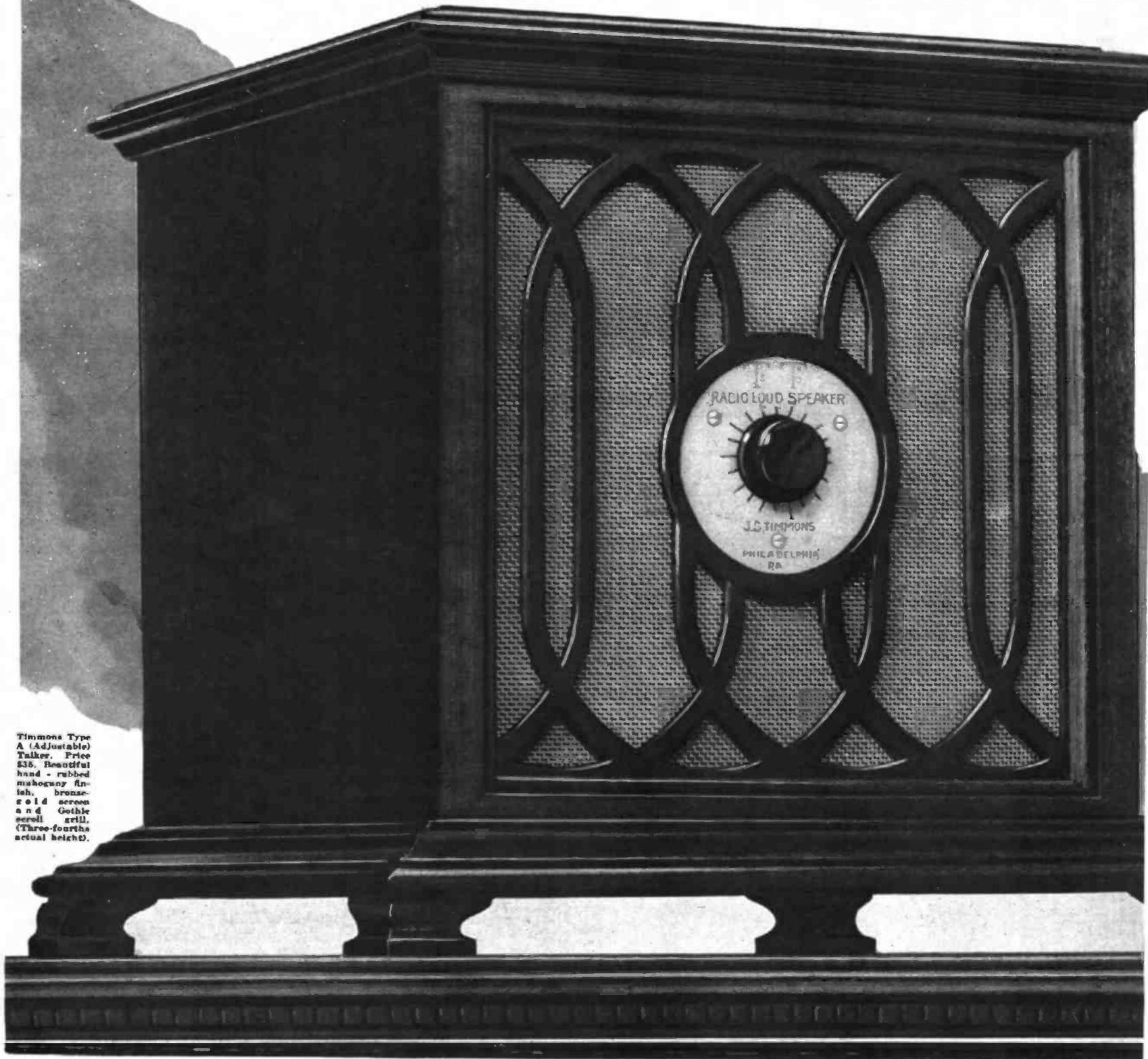
their whole lives' savings if only her sight could be restored.

But—

Let's drop into this frugal home on an evening—any evening. Into the

# Tried and Proved Loud Speal

## Housed in Cab



Timmons Type A (Adjustable) Talker. Price \$35. Beautiful hand-rubbed mahogany finish, bronze-gold screen and Gothic scroll grille. (Three-fourths actual height).

# TIMMONS.

# ers of Unsurpassed Tone Quality

## nets of Rare Beauty

—These are Timmons Talkers—pioneers of the cabinet type loud speakers embodying the Timmons reflected tone principle.

At the very beginning of Radio we felt that eventually all loud speakers would be put into cabinets, just as phonograph horns are now concealed. Who today would think of buying a phonograph with an outside horn?

However, concealing the horn in the beautiful cabinets of Timmons Talkers has not called for any sacrifice of tone or volume. On the contrary, musical critics and tone authorities have told us that Timmons Talkers reproduce fuller, rounder and more mellow tones than any loud speaker they have ever heard. These same authorities have also stressed the naturalness of tones reproduced by Timmons Talkers.

Of course, you'll have to hear and see Timmons Talkers to fully appreciate their beauty and wonderful reproducing quality. There are two types—Adjustable, as shown on the left-hand page, and Non-Adjustable, shown below. Both have a rich hand-rubbed mahogany finish. The Gothic scroll grill on the Adjustable Type is backed by a gold-bronzed screen. The Non-Adjustable Type has a silky screen backing the grill. The prices are \$35 and \$18.

Remember, in hearing a demonstration of Timmons Talkers in Radio stores located in central sections of cities that their sets are bound to pick up stray electrical currents from trolley lines, generators, motors and so forth. Inferior speakers, because they are not

so sensitive, do not reproduce these stray bits of electrical energy, but at the same time neither do they reproduce the fine musical shading which you will hear from Timmons Talkers with their extremely faithful reproduction.

### The B-Limiter Which Takes the Place of "B" Batteries

Thousands of these B-Limiters are now in use on all types of sets. They give a wonderfully smooth and noiseless "B" current right from the light socket of any alternating current, 110 volt—60 cycle circuit. Patented May 15, 1923.

The B-Limiter has taps for both detector and amplifier tubes—16 to 45 volts on detector tap and up to 135 volts on amplifier tap. All in-between voltages can be controlled even to the fractional part of a volt.

So absolutely sure are we that the B-Limiter will operate perfectly on your set that your dealer is authorized to return your money if the B-Limiter after all instructions are followed and when properly tuned fails to operate to your fullest satisfaction. Timmons Tested Radio Products are fully guaranteed by the makers and are sold by responsible Radio dealers. Any of these dealers will be glad to give you complete information and demonstrate both Timmons Talkers and B-Limiter.

Examine these remarkable products at your dealer's, meanwhile send us his name and we will send you descriptive literature.

## TIMMONS RADIO PRODUCTS CORPORATION

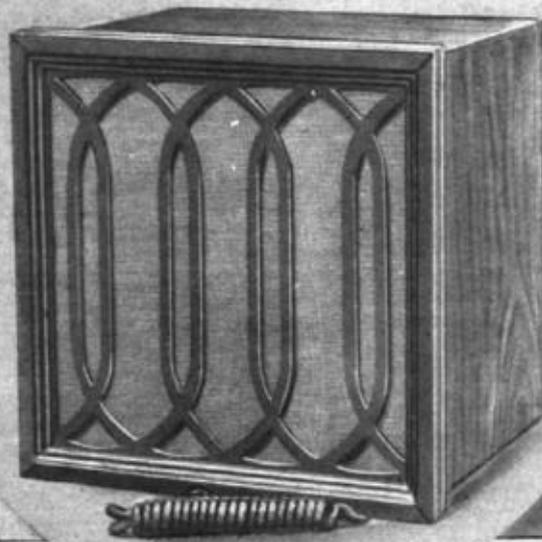
GERMANTOWN



PHILADELPHIA

Timmons B-Limiter. Takes the place of Radio "B" batteries. Price \$25. Fine crystalline finish—set home with the finest Radio set. (One-third actual height). Patented May 15, 1923.

Timmons Type N (Non-Adjustable) Talker. Price \$18. Hand-rubbed mahogany finish. Gothic scroll grill with screen harmonizing with the beautiful mahogany finish of the Talker. (One-third actual height).



# Radio Products

art or science ever conceived with a more Heavenly touch?

It is not easy for the sighted person to sense what it means to be blind. He might try to realize it by bandaging his eyes and groping around in his home, on the streets and at his work. But that is only an experiment, much like the visit of a Fifth avenue girl into the squalor of the slums in order to appreciate how the other half of the world goes through life.

For the explorer into the realm of the blind or the heart of the slums is not weighted down with the realization of departed sight, or faced with the continual impoverishment of body and mind.

So, try as we may, the best we can do is to make life as comfortable and happy for those who have lost the material windows of their souls and are now forced to go through life in the dark. A short time ago the writer had occasion to visit the home of a distinguished gentleman who was stricken with an illness while traveling through a tropical country. Hurrying back home, he found that his sense of sight was vanishing—first, he could no longer read and then it became difficult to distinguish objects in the plainest of view. Medical attention proved powerless to arrest the disorder, and like night coming down on a ship, the darkness of despair came over his life.

That was two years ago. The man's fortune was swept away, the wife had to go out to work in order to support the home, privation extended like an ever-expanding cobweb into every phase of their lives, and life seemed desolate and dark indeed.

But along came a friend and with him a radio set. Music, lectures, speech, entertainment of every sort, and with it all a fund of happiness that lifted the blind man completely out of the depth of despair and brought color to his fast paling cheeks.

"This little instrument is a real bosom friend to me," he said with an intensity of feeling that left absolutely no room for doubt. "It is hard for me to explain, you know—it is more like an emotion. You can't describe it, you can only feel it. Here in the quiet of my home, without the presence of a soul, I hear my friends, for friends they are, even though they be hundreds and perhaps thousands of miles away. If the kind souls who sing and talk over the radio only knew the pleasure that I, a lonely blind man, obtain by listening to the good things on the air, I am sure they would feel compensated in their hearts."

An active man our blind friend had been. Haven't you a picture of him sitting in an armchair practically incapable of doing anything owing to the fact that he had so long depended, like you and me, on his sense of sight? Could you, at the age of sixty-five, suddenly acquire abilities that would take the place of sight, even to a minor extent? Indeed it is far different to lose the sense of sight when young than it is to lose it in the declining years of life when the spirit lacks the maximum recuperative powers.

But the worst of it is, according to United States census figures, the pall of blindness comes down upon men and wom-

en more after the sixtieth year of life than all the years before. This is due primarily to improper use of the eyes in the early days of life. Nervous strain, dissipation of energy, weakness brought on by being sick, and lack of foresight in having defective vision corrected instead of, as in the case of the fireman's wife, magnified or further irritated by improper glasses.

There are many, many cases that can be cited to demonstrate the value and the blessing that radio has been and can further be to the blind. There is Patrick O'Keefe, for instance, a blind ex-policeman in the Harlem district of New York. His story has been told by the writer before, but it is one of the outstanding stories of the blind-radio world and will always remain an outstanding one.

While patrolling his beat one sunshiny September day twenty-five years ago, Officer O'Keefe suddenly heard the cry of "Help! Help!" come from a tenement house. Rushing into the darkened hallway, leaving the sunshine behind, he saw a man dart up the stairs. He followed, but just as he was passing a door, a shot rang out and everything became blank and dark and still.

They rushed the officer to the hospital and the best doctors hurried to his side. But when, at the end of the third week, they started to remove the bandage from his head and informed him that he was ready to go out into the world again—well, they did not have the heart to tell him, so they called a clergyman in. The shot had destroyed both eyes and he had been made sightless for the rest of his life.

Imagine a stalwart, active man like Officer O'Keefe suddenly deprived of his sight! Instead of helping children and old folks over the busy crossings, now dependent on any one and every one to guide him along his way; denied the privilege of reading from books and newspapers, denied practically everything to which he had been accustomed.

But did it break his spirit? No; he has remained active throughout all these years, and has done some remarkable things, not the least of which has been to construct his own crystal receiving set. Thus he has obtained double and even triple enjoyment out of radio—the enjoyment of building his own, of listening to the good things in the air and building sets for other people who still have their sight.

Seated there in a big armchair, eyes forever denied the light; sitting there with a pair of phones on his ears and a smile beaming on his face as electrical music dances over the ether lanes! And now the lines of thought may be seen gathering on his brow as he follows a speech or lecture, or the warmth of happiness as he becomes pleased over the result of a boxing match or baseball game—everything, everywhere, coming out from the invisible world.

Mentally he visualizes with the keenness of reality the things that present themselves via the ears to his mind. How dif-

ferent from the blind man who otherwise would be forced to live apart in his curtained world, a prisoner in a house without windows, a victim of a compelling though restricted urge! How different now when he can recline in his big easy chair and go to concerts, theatres, baseball games and participate in political discussions, and then, as a good citizen, go to the polls on election day and cast his vote for the candidate of his choice?

But let Mr. O'Keefe tell in his own words what radio means to him and many other blind. Perhaps his viewpoint may be enlightening and help us appreciate the full significance of this hobby of ours.

"No one knows the amount of good I get out of this little set," said ex-Officer O'Keefe in his Harlem home. "I am a great lover of music, and the harmony I pluck from out of the air lifts me to the heights of happiness that is good for all men. Music is the language of the spheres; it cleanses the soul. It drives away dull moments of care and rehabilitates nervous energy. I don't think there is a better tonic in all the world, and it is wonderful that radio plays so successfully into the lives of the blind.

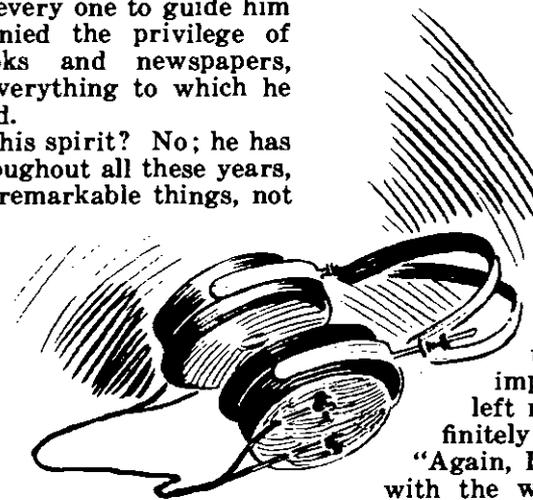
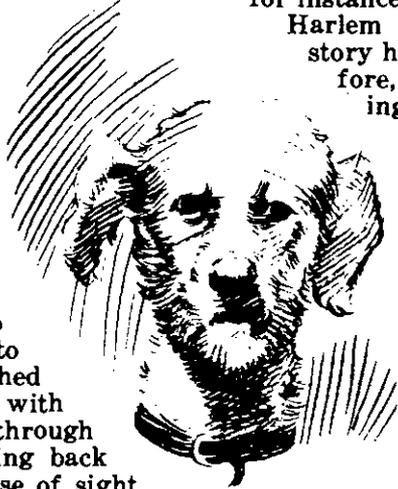
"The coming of the movies was a wonderful boon to the masses in our congested cities and those who could leave the farm and come to town. But the coming of radio is an even greater boon not only to the same classes of people, but to the blind as well. For no one but a blind man knows how much is really taken in through the ears. As a sighted person visualizes a foreign land on hearing some one describe it, just so does a blind person visualize the things and events that the sighted person sees all around him. To the blind the effect mentally is the same, or as nearly similar as his limitation of sense perception will permit.

"As an example of this, I have taken trips to various parts of the world and saw the same things a sighted person would see if he were really on the trip. That is, I have followed a descriptive world traveler so intently via radio that to me the trip was real. The palm trees of the tropics, the wilds of the African jungles, the fjords of the North, the bamboo home of the Igorotte or the snow hut of the Eskimo—each in turn has made its indelible impression on my mind and left me more contented and infinitely more happy.

"Again, I have sat on the platform with the world's best speakers, and shared everything but the food and drink of the banquet hall. To the sighted person who has other things that demand his attention these events probably mean little, but to one who cannot get out and around they mean more than words can tell. By following them, one gets the joys and the laughs, and can gauge how things are setting in this world.

"And after all, unless one participates in the affairs of men, be they social, religious, civic or sport, he can't have much enthusiasm for living, and that's something I, a blind man, never want to lose."

One of the most cheerful men in the world is Mr. O'Keefe. A few tools, coils, condenser, crystal and



**"This is the Herald-Traveler,  
Westinghouse Studio, Hotel  
Brunswick, Boston"**

(Continued From Page 24)

you the wrong impression! They weren't snappy — far from it! Mr. Eisemann and Mr. Breglio gave me an hour in Boston at their hotel before they even had breakfast! When I met Mr. Edes for the first time he was up to his ears in work. air! As Mr. Jaspert, the station director, was on a well-earned vacation, Mr. Eisemann and Mr. Breglio, of Springfield, jumped a train to Boston to meet the Coogan organization and Mr. Edes to see if somewhere, somehow, WBZ could "keep faith"



The operating staff of Station WBZ. From left to right—George Lang, P. W. Harrison, "Phil" Robinson  
Photo taken especially for "Radio in the Home," by Jacoby, Boston

Yet they and every one else at WBZ went out of their way to see that I got the information I wanted for you.

Although WBZ will not admit it, the station has two slogans. You have to be there only a short time to find that out for yourself. They are "Keep the faith of your audience," and "Nothing but the best."

"This is the Herald-Traveler-Westinghouse Studio of WBZ at the Hotel Brunswick, Boston, broadcasting an interview between Jackie Coogan and Joe Toye at the Kiwanis Luncheon in the Copley Plaza, Boston." This is all the announcement the radio audience had of hours of hard work on the part of the staff of WBZ.

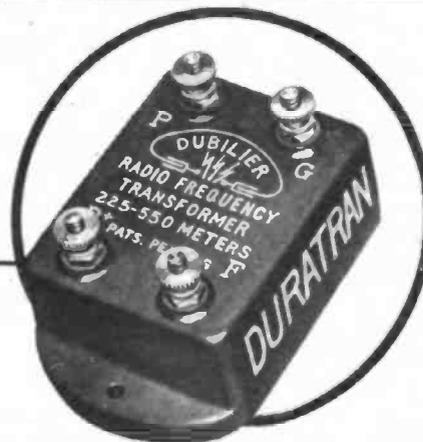
You don't know how near you came to not hearing "America's greatest kid!" The partial program for Tuesday, August 26, read on Monday "12:55 P. M. Time Signals and Weather Report," "9 P. M. Jackie Coogan at Herald-Traveler, Westinghouse Studio, Hotel Brunswick, Boston."

Monday afternoon Jackie's plans had to be changed and in order for him to keep an engagement in New Haven Tuesday night, he had to leave Boston on the 5 o'clock train. WBZ had announced Jackie Coogan to its audience and to "keep faith" with its audience Jackie had to be put on the

with its unseen audience. "Would Jackie give them time somewhere in Boston" Or "would Jackie go to New



A. F. Edes, "EFA," announcer and program director of Station WBZ  
Photograph by Perhan



## Get Those Stations With the DURATRAN!

You can get them on your homemade set—even with an indoor loop. Clear and strong! Only one thing is needed—the right radio frequency transformer—the DURATRAN!

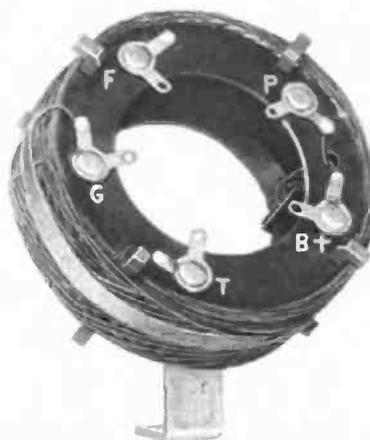
Powerful! The Duratran picks up all standard broadcasting wave lengths—the entire band of from 225 to 550 meters. And amplifies as much as 20 times. Yet the reception is clear, undistorted, full!

Don't discard your one-tube regenerative set because you can't get the distant stations. The Duratran will bring them in.

Sold by all good dealers. Price, \$4.00

# Dubilier

CONDENSER AND RADIO CORPORATION



Radio Fans who are building Radio Frequency Circuits will be interested to know that the Kellogg Switchboard and Supply Company have placed on the market a new Radio Frequency Transformer. This air core transformer is of the aperiodic type, suitable for all sets with which Radio Frequency is used, and also suitable for one stage of Radio Frequency Amplification ahead of regenerative sets to prevent re-radiation.

The primary of this aperiodic transformer is arranged with two terminals—one for all wave lengths with a short antenna, and the other for all wave lengths with a long antenna. The secondary is arranged with suitable taps for biasing features. A minimum amount of hard rubber is used in the form. The manner of winding and the absence of any kind of "dope" to hold the windings in place, reduces losses to a minimum, assuring a transformer of the highest efficiency.

The terminals are arranged for soldered connection.

The mounting bracket holds the transformer at the proper angle for the maximum results.

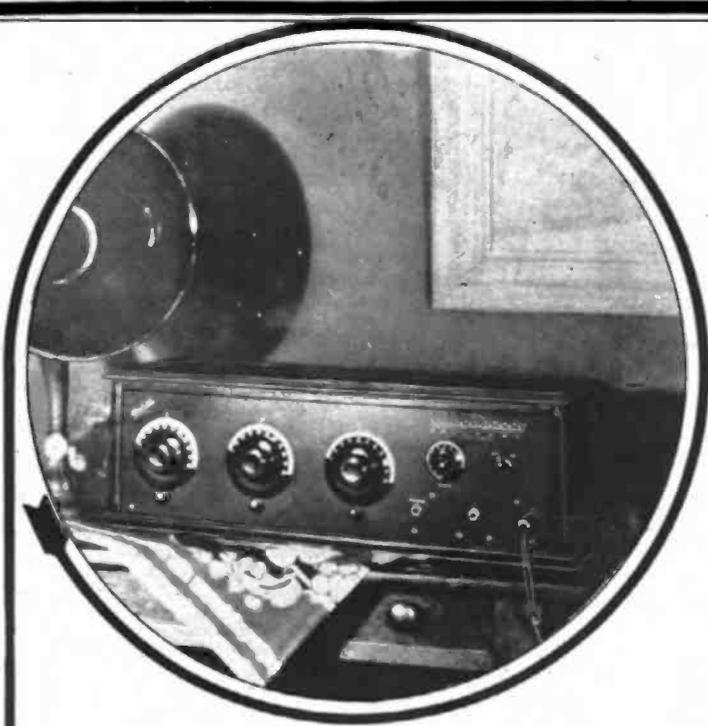
At your dealers—No. 602.....\$2.35

Use—Is the Test

**KELLOGG SWITCHBOARD & SUPPLY COMPANY**

1066 West Adams St.

Chicago, Ill.



—And it comes in like Velvet

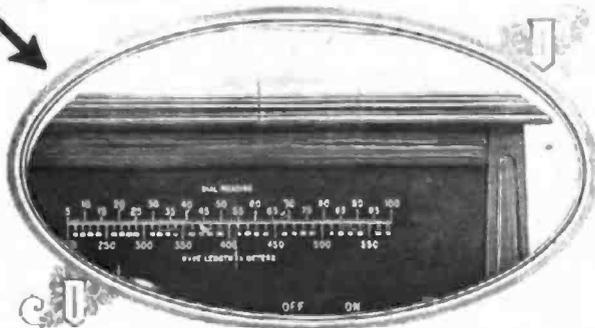
There is no station whistle on the Pfanstiehl Model 7. You hear no "air rush," no "overload," no suggestion of noise of any kind. You slowly turn the dials and the music comes in like velvet.

Pfanstiehl long ago made up his mind that it ought not to be necessary to invent methods of stopping howls and squeals in radio sets—it ought not to be necessary to neutralize or introduce the costly losses of potentiometer control. In his physicist's laboratory he developed delicate instruments with which he explored all the invisible magnetic and electro-static fields in standard sets. And he discovered that distortion and noise were primarily the results of clashing fields that interfered with each other. Reduced to simplest terms, he found that these disadvantages were due to inefficient design of coils and faulty placement of parts. With these two errors corrected, no other compensation was necessary or desirable—for all compensation means loss of valuable energy.

The Pfanstiehl Model 7 embodies his solution of these problems. It is a totally new system, incorporating two stages of tuned radio frequency, tube detector and two stages of audio amplification—low ratio, of course, to give perfect quality, with all the volume desired.

And, with the other improvements came the great step forward which takes all the guesswork out of tuning—which makes it a perfectly simple matter for the merest novice to bring in the desired station as easily and surely as he can produce a tune by putting a record on his phonograph.

**PFANSTIEHL RADIO COMPANY**  
HIGHLAND PARK, ILLINOIS



There are three large dials which are turned identically, or to the same number, for any given station. This means that to receive on any one "wave length" you need to know but one number. That number is given by the "Station Finder." On its lower scale, read the "wave length" of the station desired. Directly above read the number at which the three large dials are all to be set to secure reception. Tuning may finally be sharpened by means of the vernier knob.

The women, children, "old folks," novices and all who want results, and want them promptly, may enjoy the Pfanstiehl Model 7 because the "Station Finder" takes the guesswork out of tuning.

**Suggestion to Dealers**

It will pay you to get in touch with us at once. This new system holds the greatest promise in radio today.

Haven via Springfield and broadcast from there?"

Jackie is a radio fan himself and totes a Crosley portable 'round with him. He didn't want to disappoint his friends, so it was finally arranged that Jackie would talk at the Kiwanis Luncheon at noon Tuesday. That was 6 o'clock Monday evening. The line at the Copley Plaza had to be opened and tested and the Boston staff ready. It meant that the Springfield staff had to be notified and an operating crew ready. Announcements of the change were made on the air and through as many papers as could be reached.

The luncheon at the Copley Plaza was set for 12:00 and then postponed

Meanwhile in Springfield the phones were buzzing like alarm clocks. "When do we get Jackie Coogan?" "I don't hear Jackie Coogan. Is anything wrong with my set?" But that isn't all! WBZ had announced a broadcast for 9:00 P. M. Tuesday so there had to be one! None of the outside artists could be secured on such short notice, so "A. E. B.," who really can sing, promised to fill in. No one at WBZ announces his own program, and as it was "A. E. B.'s" turn to announce, another announcer had to be secured. At the time I left Springfield for Boston they had not been able to get in touch with their announcers off duty, so



Broadcasting the arrival of the "Round-the-World Fliers," at Boston, by the Herald-Traveler, Wealinghouse studio of WBZ

Photograph by P. & A.

until 12:30. The line to the Brunswick from the Copley Plaza was tested three times Tuesday morning and found O. K. At 12:00 M "line O. K." At 12:05 P. M. "line dead!" 12:10 P. M. line again in operation. Business of hotel porters mopping up buckets of blood perspired during the operation!

The luncheon started and the program was again changed so as not to detain Kiwanis too long from business. Finally, Jackie was on the air! And all you heard was "This is —!"

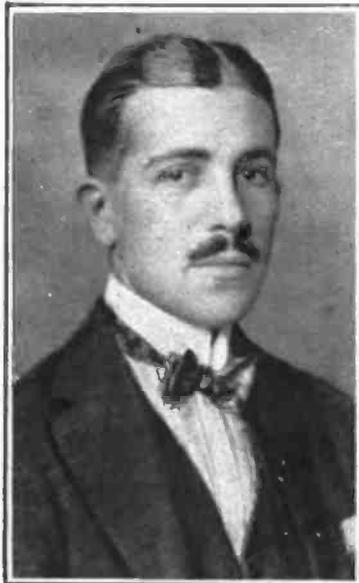
they were going to have Bach sing in Springfield and announce from Boston. All to "keep faith." But, by the time the program was due, an announcer was located in Springfield and you missed a remarkable example of operating skill. Really, you did miss it, for in their modesty WBZ would have said nothing about it.

WBZ tries to give a balanced program. If there is jazz one night, they try to give classical music another, the lighter music on another, and in talks they make every effort to have variety. In giving "Nothing but the best," Mr. Eisemann let the remark drop that "If good vocal music, good talks, or good instrumental music should suddenly cease to be available, WBZ would do without it until such time as it is available even if it meant running nothing but jazz for two months."

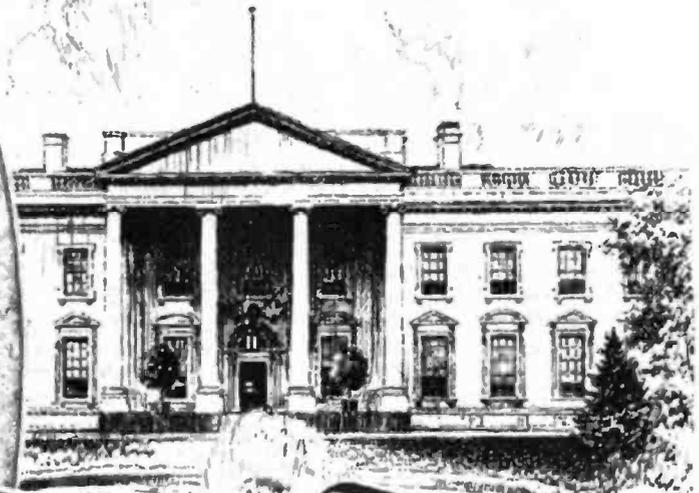
The "Coogan stunt" is but one of many. The acceptance speeches of Coolidge and Davis were rebroadcast from the short wave transmission of KDKA. Eventually what is now the telegraph auxiliary in the station photograph will be a short wave transmitter for broadcast. During the International Balloon Races in Europe, a special program was put on for Van Orman, the pilot of the Goodyear III, which the Associated Press announced he received while over Holland. Once a year at the Conference of the New England Governors, the addresses of all the New England Governors are broadcast.

It is difficult to name the "favorite artists." With both Boston and Springfield to draw from it is seldor that an artist repeats.

Most broadcast stations cover quit a distance and you are generally informed of the fact shortly after you



C. M. Burr, "CMB," announcer of Station WBZ



# Table-Talker

Keep in Touch with  
National Events

The final desperate spurt as the Presidential campaign draws to a close! The returns as they pile up on election night. Great speeches and vital messages—the inaugural address, the later congressional messages—hard, slow reading, but easy to listen to—with a *Table-Talker*.

And, too, there's everything from football to recipes, from grand opera to market reports, from prize fights to bedtime tales. All brought to your home—shared with your family and your friends by the *real* reproduction of the *Table-Talker*.

PRICE  
\$10

# Brandes

The name  
to know in Radio



# How I Average \$12 a Day in RADIO WORK

By Howard Houston

"YES, Mr. Crosby, I'll have the set installed tonight . . . yes, all ready to 'listen-in' . . . sure you'll be able to get Washington by 9 o'clock."

Another hour and a half job! And another ten-dollar bill in my pocket! It all seems like a dream. But let me tell you the whole story from the very start.

A few months ago I was driving a bread wagon, selling bread to retail stores. I had a good route though, and if I do say so myself, I had built up a pretty good business. But try as I could, thirty-five dollars a week was all I could make that job pay.

I'd be working there now if it hadn't been for Mary. We'd been "keeping company" for about two years, and everything was all set for our getting married as soon as I would be earning more money. But the old job didn't hold out much promise—and I didn't see how I was qualified for any other work that would pay more.

It was Mary who gave me the tip. "You can't earn big money," she said, "unless you're some kind of a specialist. Learn some line of work—become an expert in it." But what business, profession or trade was there that wasn't overcrowded? Where could an ambitious fellow stand a good chance to earn big money and get ahead? Stenographers, accountants, clerks—all down the line—every well-established line of work was overcrowded, and the pay was small.

Then Mary said, "Why not find a new field?" That was a good thought. The men who went into the railroad business early "cleaned up." The same was true of the movie game, the automobile business—but what was the coming field? What new development was there that looked like a new promising industry?

We both jumped to our feet. "RADIO."

Why hadn't we thought of it before? All around us was the evidence of the tremendous development of Radio. The broadcasting stations sprouting up all around—the rapid increase in Radio stores—new radio manufacturing plants—everybody talking about the latest program. Radio had captured America almost overnight—and thousands of men who were on their toes were due to make fortunes out of it.

## Thousands of Men Needed

The very next day after I had finished my route, I went to several Radio business firms. "Sure, there was an opening. Oh, they'd pay big money—but did you know Radio?"

That was my cue. Learn Radio. Become a Radio Expert—and I did!

Well, that really is my whole story. I've only started. I've followed the path of least resistance. Sort of built up a business of my own installing, building, and repairing radio sets. Any small job pays me at least \$5—and usually \$10. I can easily make from \$50 to \$100 a week—and more as I get my work systematized.

What Mary and I have got to decide after our honeymoon—oh, yes, we are soon having a very quiet wedding—what we must decide after that—is which end of Radio will be best. You see, there are dozens of different kinds of work in this field, it's so big. I've



"Ah! there's Washington coming in clear as a bell."

already had several offers—one to take charge of a Radio department, another with a broadcasting station, another to give Radio demonstrations, and a good offer as superintendent of construction in a Radio plant. What we want to decide on is which will not only pay the most money now but will lead to the most rapid advancement in the future.

## Easy to Learn Radio at Home in Spare Time

Just a word about this Radio business. Some fellows think you've got to have some training before you start to learn Radio. That's bunk. I didn't know the difference between an amplifier and a doorknob before I started. But let me give you a tip. Don't experiment with your Radio course. Get the best. The National Radio Institute has been teaching Radio ever since 1914. The Government recognizes its course by allowing credits to its graduates applying for a commercial license, so you see you can be confident you're getting the best training possible—and that means a lot.

This course is the only absolutely complete one now being offered which qualifies for a Government first-class commercial license. It gets you the bigger paying jobs in Radio.

Send for Free Book

## "RICH REWARDS IN RADIO"

Incidentally, the National Radio Institute publish a mighty interesting book on Radio. They send it out without cost to any one who wants to learn about Radio. It is filled with facts, photos and figures, on the Radio industry, and tells all about its course which quickly prepares you right at home in spare time for one of the big pay positions in Radio.

Take my advice—and Mary's—and send for that, no matter how little you know of Radio, or what your plans are. For a short time they are offering a reduced rate for those who enroll now. Act promptly and save money. Just mail the coupon today. Address the National Radio Institute, Dept. 54LA, Washington, D. C.

NATIONAL RADIO INSTITUTE  
Dept. 54LA, Washington, D. C.

Please send me, without cost or obligation your Free Book "Rich Rewards in Radio," which tells all about the opportunities in Radio, and how spare-time study at home will qualify me for a big-paying Radio position. Also full details on your Free Employment service.

Name ..... Age .....

Address ..... Occupation .....

City ..... State .....

arrival. At WBZ, when I called their attention to a map of places from which they had received mail, they said, "Oh, yes!" and let it go at that. The station has been heard in New Zealand, which is roughly 10,000 miles from Springfield. The daily fan mail includes letters from over one-half of the States in the Union and provinces of Canada. During last spring practically every day mail was received from the British Isles or Europe.

And now I think we had better bid our friends at WBZ "good-by." But before we leave we must thank them for their kindness to us in showing us around with all they have to do. We also want to thank them for the photos. Did you hear that? They even asked us to "come again."

## How the Harkness Reflex Can Be Changed to the New Harkness Counterflex

(Continued From Page 15)

plate of the tube. Mr. Rice explains the operation as follows:

"In order to compensate for the coupling due to the natural capacity between the grid and anode (plate) . . . I apply to the grid circuit through the condenser 13 (the counteracting condenser) an electromotive force equal and opposite to that impressed upon the grid from the anode (plate). In order to do this the cathode (filament) is connected to the central point of inductance 4 (L2 of Fig. 3), the grid is connected to one end of this inductance and condenser 13 (the counteracting condenser) is connected to the other end."

Mr. Rice further explains that, in some cases, the foregoing means may be insufficient to prevent oscillations being produced because of the capacity coupling between inductances L2 and L3. In such an event he suggests connecting the B battery to the central point of inductance L3, as indicated in Fig. 3. The e. m. f. impressed on the grid circuit through the capacity coupling from one end of L3 will then be equal and opposite to that impressed on the grid through the capacity coupling from the other end of the coil.

Still another method of using counteraction to control self-oscillation is described by Lester W. Jones in a patent recently granted. The general principles of this method are shown in Fig. 4. In the circuit used by Mr. Jones variometers are used instead of variable condensers to tune the grid circuits, but the method of obtaining counteraction is exactly as shown in Fig. 4. The inductance L4 is closely coupled to the plate inductance L3. The free end of L4 is connected through a small variable condenser to the grid of the tube. The same result achieved by the Rice method is thereby obtained, although in a different manner. An e. m. f. equal and opposite to that impressed on the grid from the plate is impressed on the grid through the counteracting condenser.

My Counterflex method of using counteraction is illustrated in Fig. 5. As distinct from all others, this means of using counteraction is intended only for a reflex circuit. Counteraction is obtained by the ex-

ceedingly simple method of connecting the plate of the tube, through a small variable counteracting condenser, to the lower end of inductance L2.

To those who have experimented with the different methods of using counteraction outlined above the difference of the Counterflex method will be very marked. Whereas the other methods usually require delicate and careful adjustment of the counteracting condenser, the operation of the Counterflex condenser is, without exaggeration, as simple as the operation of a potentiometer. If, when the circuits are tuned to a certain frequency, continuous oscillations are set up, they can immediately and positively be damped out by merely increasing the capacity of the counteracting condenser.

## Editorially Speaking

(Continued From Page 8)

the result of rough handling or accident, I went to our shelves and took down the package containing the other variable condenser, opened it and found the same condition there. The condenser had simply fallen hopelessly to pieces standing on our shelves. *Radio News* laboratories give this condenser a certificate of merit. We will not accept the advertising of this condenser. That is the difference.

We ourselves have made mistakes in the past. We have made them more in a spirit of charity than anything else. We have carried advertising of certain firms which, though we knew that they were not sufficiently financed, we felt were intending to do business in a perfectly honest way and that, with a little encouragement, they would place themselves upon a secure foundation and be a valuable asset to the radio industry and to the fans in particular.

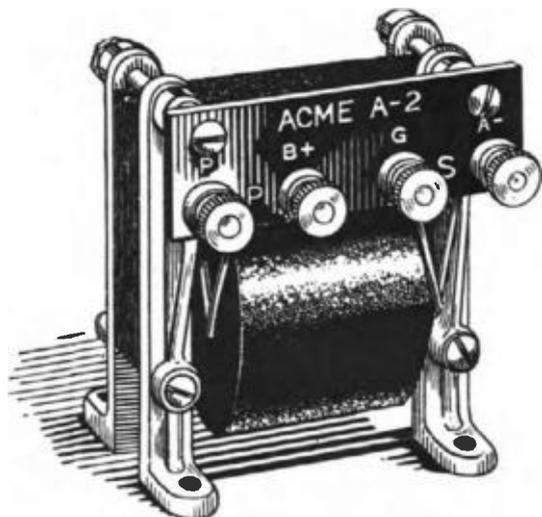
We have been fooled in two cases. In both of those cases we have excluded the advertising and have forced the firms to clean house thoroughly and to make good on every order received through this magazine.

With a policy as rigid as ours, we will never carry the bulk of advertising that other magazines carry. We do not want it. We believe that our readers want us to judge for them whether apparatus is worth buying or not, and the only way by which we can tell them this is either by accepting or excluding the advertising of that apparatus. We do not feel that it is necessary to give certificates of merit to any article. *The mere fact that it is accepted for advertising in this magazine is our certificate.*

There is another way by which we are suffering from this policy. I might name one radio product whose advertising was offered to us. Now this product happened to be a very excellent one for the specific purposes for which it was originally designed. Some imaginative gentleman with the advertising agency, however, thought that he could increase sales by claiming that this piece of apparatus would do many other very desirable things, and so he wrote a glowing advertisement claiming that it would do these things. This advertisement was sent to our office and was, in the natural course of events, forwarded to me for my O. K. I refused the advertis-



# Give your loudspeaker a chance!



**N**O MATTER what loudspeaker you have, it can't give you loud, clear reproduction unless you have proper audio amplifying transformers.

If your audio transformers don't deliver clear, strong, undistorted energy, you can't expect your loudspeaker to correct the faults for which your audio transformers are responsible.

The thing to do is to put ACME Audio Transformers in your set and *then* listen to your loudspeaker. ACME Audio Transformers will give your loudspeaker a chance to entertain you with all the thrills and enjoyment you expected and which you are entitled to.

Send 10 cents for 36-page book, "Amplification Without Distortion," containing many practical wiring diagrams and many hints for getting the best out of your set.

ACME APPARATUS COMPANY  
Dept. 141, Cambridge, Mass.  
*Transformer and Radio Engineers and Manufacturers*

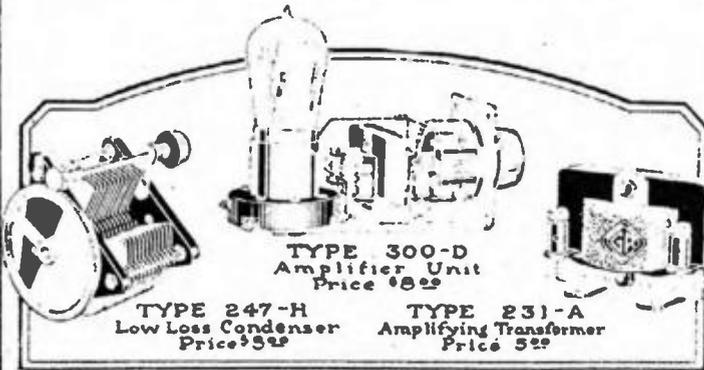
# ACME

*~ for amplification*

ACME APPARATUS COMPANY,  
Dept. 141, Cambridge, Mass.  
Gentlemen:—Enclosed find 10 cents for copy of  
"Amplification Without Distortion."  
Name .....  
Street .....  
City .....  
State .....

# GENERAL RADIO

## Parts Give SUPER-RECEPTION



*Selectivity, distance, clarity and volume* are the qualities which constitute *good reception* and are what you may expect from your set if you build with GENERAL RADIO parts.

For over a decade GENERAL RADIO Condensers have been the *universal favorites* because of their *low losses* and over-all efficiency.

Since 1917 GENERAL RADIO Amplifying Transformers have been the leaders—not only in a historical sense, but in *undistorted amplification*.

The type 300D is an amplifying unit designed for the convenience of amateur set builders. It combines the advantages of an efficient transformer, rheostat and socket compactly assembled and ready for easy installation.

Whatever your circuit—build with GENERAL RADIO parts—for *Super-Reception*.



Ask Your Dealer  
or Write for  
These New  
Instructive  
Booklets



GENERAL RADIO Co.  
Cambridge, Mass.

GENERAL RADIO Co.

GR

ing. I wrote a memorandum to Mr. Dudley, our general manager, telling him that that piece of apparatus was an excellent one for the specific purposes for which it was manufactured, but that it positively would not accomplish the things that the agency claimed for it and that I would not O. K. any copy that claimed it would accomplish these things. I added that I would be extremely glad to have the article advertised in this magazine if it were advertised as doing the things for which it was intended.

Mr. Dudley informed the agency of this memorandum and the agency immediately resented my attitude. Agencies have an idea that magazines should get down on their knees to the advertising men, and this agency is trying to get me down on my knees to it. Unfortunately my knee joints are getting stiff in my old age and I do not get down with any great degree of grace or alacrity.

The agency, in order to whip me into line, has refused to turn over to us two other large and very excellent accounts which they handle. We happen to know that the manufacturers who are the principals in these two accounts are very favorably disposed toward this magazine and would place their advertising with us, but the agency declines to place us on the list. We have been very frankly informed by the agency that when we accept the copy of the first advertisement we will also get the other two. That means that we will do without all three.

I am proud in this issue, which begins our career as a ten cent magazine, to announce the addition of our staff of another very famous man among the broadcast listeners.

This is Edmund T. Flewelling, designer of the Flewelling circuit, which has been probably the most successful circuit of its kind that has ever been put before the radio public.

The original Flewelling circuit is a marvel as a consistent bringer in of distant stations. It is, however, difficult to tune and it requires a lot of practice to be able to handle it readily. Mr. Flewelling has now designed some improvements upon this circuit, and these improvements will be disclosed in his first article which will be printed in the next month's issue of this magazine.

Mr. Flewelling has also just about finished development work upon a totally different system of radio reception which, I feel confident, is going to create a considerably bigger stir in the radio world than his original circuit did. As soon as development work is finished on this circuit, Mr. Flewelling will announce the new system exclusively in this magazine.

This now gives us as our regular associate editors, writing exclusively for us, David Grimes, inventor of the famous inverse-duplex system; Kenneth Harkness, originator of the famous Harkness reflex, and now announcing his new Harkness counterflex, and Edmund T. Flewelling, of whom I have already spoken. For our regular contributing editors we have Brainard Foote, one of the best-known radio writers of the country, who is going to specialize in his next series of articles on the problems that confront the newcomer in the radio ranks.

We also have W. Francis Goodreau, whose very intimate and charming personal chats with readers have endeared him to thousands who do not want to go into the construction of elaborate sets, but who prefer to confine themselves to the more simple and inexpensive outfits until they are thoroughly satisfied that their interest in radio justifies a further expansion.

We now have built up a staff of regular correspondents covering every important city in the country, and they will keep our readers informed

of all developments in the broadcasting stations of their territory. We feel that this gives us quite a complete service to offer to our readers. It is certainly a good deal to buy for ten cents.

So we hope you will like us better as we are now than as we were at first when we were a modest thirty-two page magazine and with the present editor writing virtually the entire periodical. How you ever stood all of that stuff which I wrote in the early days with no relief by other and better writers I do not know. But I do know one thing, and that is, that I am inexpressibly grateful to the loyalty and the friendliness of the readers who started with us and who have stayed with us ever since. I trust that the gradual building up of our staff to its present very fine proportions will reward them for their patience, and will in large measure compensate for some of the tiresome things I wrote and which they had to read if they wanted to read the magazine at all.

### Flewelling Joins Our Staff

(Continued From Page 11)

told her, "a man will be able to carry a radio set in his hand and pick up speech and music from a radio station a thousand miles away."

Radio spells real romance to Flewelling. It is inextricably interwoven with his life.

His aged mother who now lives in Wakefield, Mass., in a stucco cottage which the versatile Flewelling fashioned with his own hands, can forgive now the pilfering of the zinc mat on which her heating stove sat in days long gone by, for radio has been a boon indeed to her.

Few days pass that Mrs. Flewelling does not hear the voice of her son as clearly as though he were in the same room with her. For Flewelling has his own broadcasting station, one of the prime purposes of which is to afford him constant and instant communication with his mother.

During the daytime, Station 9XBG, specially licensed by the Government, is used for short-wave transmission experiments. But in the evening the experiments can go hang—Flewelling has to call up his mother.

At the outset Flewelling went through the same struggles that other inventors have been subjected to—only he emerged with flying colors. There were temptations, too, but he had the courage to withstand them.

"When I first went to New York after the Flewelling circuit had made its debut and had met with considerable success, I turned down not less than \$10,000 in cash from unscrupulous manufacturers who were willing to pay amounts ranging from \$1000 to \$5000 each if I would permit them to use my name on inferior products," Flewelling explained to the writer. "Naturally I had vision enough to see what this would have done to my reputation, and despite the eagerness of youth to cash in on my development I realized how unfair it would be to radio fans to permit such an imposition on their confidence."

Flewelling is now engaged in the manufacture of radio sets and parts designed by him and bearing his name. But he has not forgotten the struggling amateurs, nor are his personal interests ever in conflict with "the good of the game."

This winter the members of the Milwaukee Radio Amateurs' Club will compete for a silver cup, presented by Flewelling personally. It will be awarded to the amateur member who proves himself to have the best grasp of the general subject of radio.

Mr. Flewelling's first article for *Radio in the Home* will appear in the December issue.



*It's Easy to Cut and Drill*

# Radion Panels

No special tools are required. Common house tools will turn out a clean hole and a straight edge, with no chipping.

There are 18 stock sizes to select from—literally a size for every set. This means less cutting and little waste, sometimes a definite saving in real money.

Exhaustive research has shown that RADION excels other insulations in the important electrical and mechanical characteristics. It's worth while to ask for RADION Panels and Parts. Be sure to get only the genuine.

Do not accept inferior so-called hard rubber panels that are not RADION and that do not have the insulating values of RADION.

**American Hard Rubber Company**  
11 Mercer Street New York

## 18 Stock Sizes

*Mahogany and Black*

- |                |                |
|----------------|----------------|
| 3-16 x 6 x 7   | 3-16 x 7 x 21  |
| 3-16 x 6 x 10½ | 3-16 x 7 x 24  |
| 3-16 x 6 x 14  | 3-16 x 7 x 26  |
| 3-16 x 6 x 21  | 3-16 x 7 x 30  |
| 3-16 x 7 x 9   | 3-16 x 7 x 48  |
| 3-16 x 7 x 10  | 3-16 x 8 x 26  |
| 3-16 x 7 x 12  | ¼ x 8 x 40     |
| 3-16 x 7 x 14  | ¼ x 10 x 36    |
| 3-16 x 7 x 18  | 3-16 x 20 x 24 |



Look for this stamp on every genuine RADION panel. Beware of substitutes and imitations!

# RADION

*The Supreme Insulation*

## PANELS

*Dials, Knobs, Sockets, Insulators*

## Every Kansas Farmstead Can Be a College Classroom

(Continued From Page 30)

course is prepared with the idea of helping business men with their problems.

"Under the direction of Dr. Howard T. Hill, the public speaking course deals with the correct ideas or bases of modern public speech, and the place of public speech in American community life. Natural speech instead of the 'old-time' elocution will be Dr. Hill's theme. Arrangement and preparation of addresses and some suggestions for the person whose duty it

decorating, millinery, fashions, nutrition and home nursing. It is the aim of Miss Amy Kelly, head of Home Demonstration work in Kansas, to show the homemaker of today how she may, by careful planning, save her strength for doing other useful things besides the routine work. These lessons give some general information and suggestions intended to help the housewife find more joy and pride in her work.

"Under the head of Engineering

**Radio Extension Courses**  
KANSAS STATE AGRICULTURAL COLLEGE  
DIVISION OF COLLEGE EXTENSION  
MANHATTAN, KANSAS

Enrollment Card For Radio Extension Courses

Name..... Business.....  
P. O. .... R. F. D. or St.....  
State..... Age..... Date.....  
Time 7:30 to 8:00 p. m.

Check subjects in which you desire to enrol with an X.

**AGRICULTURE (Monday and Tuesday, 7:30-8:00)**

Course Starts	Course Starts
Sept. 15 Famous Hereford and Shorthorn Breeds..... <input type="checkbox"/>	Sept. 15 The Wheat Industry of Kansas..... <input type="checkbox"/>
Nov. 16 Beef Cattle Industry..... <input type="checkbox"/>	Jan. 6 Alfalfa in Kansas..... <input type="checkbox"/>
Jan. 5 The Hog Industry..... <input type="checkbox"/>	Sept. 15 Utility and Exhibition Judging..... <input type="checkbox"/>
Feb. 2 The Sheep Industry..... <input type="checkbox"/>	Jan. 6 Incubation..... <input type="checkbox"/>
Sept. 15 Fruit and Vegetable Gardening..... <input type="checkbox"/>	Feb. 3 Housing of Poultry..... <input type="checkbox"/>
Nov. 16 Dairying in Kansas..... <input type="checkbox"/>	

**ENGINEERING (Wednesday, 7:30-8:00)**

Sept. 17 Heating the Home..... <input type="checkbox"/>	Sept. 17 Farm Water Supply..... <input type="checkbox"/>
Nov. 12 Electricity in the Home and on the Farm..... <input type="checkbox"/>	Nov. 12 The Shop, Automobile and Truck..... <input type="checkbox"/>
Jan. 7 State Highways..... <input type="checkbox"/>	Jan. 7 The Home..... <input type="checkbox"/>
Feb. 4 Local Road a Part of the State System..... <input type="checkbox"/>	Feb. 4 Farm Tractors..... <input type="checkbox"/>

**HOME ECONOMICS (Thursday, 7:30-8:00)**

Sept. 15 Clothing Selection and Design..... <input type="checkbox"/>	Sept. 15 Household Management..... <input type="checkbox"/>
Nov. 12 Textiles..... <input type="checkbox"/>	Nov. 12 Home Nursing..... <input type="checkbox"/>
Jan. 5 Household Furnishings..... <input type="checkbox"/>	Jan. 5 Foods..... <input type="checkbox"/>
Feb. 5 Interior Decoration..... <input type="checkbox"/>	Feb. 5 Human Nutrition..... <input type="checkbox"/>

**GENERAL SCIENCE (Friday, 7:30-8:00)**

Sept. 15 Business English..... <input type="checkbox"/>	Sept. 15 Home Business Essentials..... <input type="checkbox"/>
Nov. 14 Chemistry in Every Day Life..... <input type="checkbox"/>	Oct. 17 Teacher Training for Leadership..... <input type="checkbox"/>
Jan. 5 Music Lectures..... <input type="checkbox"/>	Nov. 14 Radio and Other Problems in Physics..... <input type="checkbox"/>
Jan. 23 Public Speaking Lectures and Readings..... <input type="checkbox"/>	Feb. 4 Economic Aspects of Botany..... <input type="checkbox"/>
Feb. 4 Entomology..... <input type="checkbox"/>	Feb. 4 Four Claimants to Great Wealth..... <input type="checkbox"/>
Feb. 4 Bacteriology..... <input type="checkbox"/>	Apr. 3 Practical Phases of Zoology..... <input type="checkbox"/>

NOTE—No charge for enrollment in the United States or Canada. No charge for printed lectures to residents of Kansas. Non-residents of Kansas will be mailed printed lectures upon payment of 15 cents for each course in which they enrol.

Use back of card for mailing

*The ticket that gets you inside*

is to plan a public speech will be worked into the course.

"A few of the more important principles of law and its application to everyday business affairs will be brought out in a course on American Business and Farm Law offered by Prof. A. F. Peine. Questions touching the equitable distribution of wealth will be discussed under the head of Economics and Sociology by Dr. J. E. Kammeyer.

"The physics courses will include many practical hints for proper manipulation of radio sets in order that maximum efficiency may be attained and that the operator may have a better understanding of the set itself.

"Every Thursday night of the thirty-two weeks is devoted to Home Economics. The program includes courses in home management, interior

are catalogued courses on heating, fuels, electricity in the home and auto, operation of the automobile and truck in the winter season, and the use of machinery of all kinds. One course is devoted to the State highway system. Another course will deal with the principles of house planning, problems concerning equipment, convenience, materials and methods of construction. Helpful ideas in home designing and landscaping home grounds will receive attention.

"Concise lectures in Agronomy and Animal Husbandry, following a definite continuity throughout the four eight-week semesters of the 'College of the Air,' have been arranged. The livestock courses are planned so that a thorough discussion of the subject may be completed in a four-year period. The courses in 'Alfalfa' and 'Wheat Production' presented by

# "Gets the Absolute Limit Out of Any Set"



"Your Superspeaker is my biggest help in closing the sale of any complete set" writes in a successful amateur builder. "It gets the absolute limit out of any set in tone, volume and distance."

Here's a frank, simple statement. It rings true. Grasp its full significance!

"The absolute limit of any set"! That's what every devotee of radio wants with all his heart. And The Superspeaker is the way for him to get it—without extra batteries and with an original method of adjustment that never deteriorates.

The owner of a Superspeaker-equipped set always welcomes every form of competitive test. Comparison always confirms the pride in its performance.

Here is the reproducing instrument you need for 100% performance.

Get a Superspeaker and reach out!

JEWETT RADIO &  
PHONOGRAPH CO.

5682 Twelfth St., Detroit, Mich.

*The*  
**Superspeaker**



# A-C DAYTON XL-5

## Perfect Clearness of Reception—

**THAT'S** what you must have, if you are to derive maximum enjoyment from the Receiving Set you are going to buy.

That's what you will get if you choose the A-C DAYTON XL-5. Here is a truly great Receiver that is meeting with wonderful acceptance all over the country.

Take every feature to be expected in a high grade Receiving Set and add **PERFECT CLEARNESS OF RECEPTION**—all these are embodied in the XL-5. A beautiful cabinet, finished in dark mahogany, completes this remarkable set.

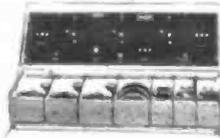
Ask the A-C DAYTON dealer in your community for a demonstration. Note the simplicity of operation and the ease with which you can select your favorite program, and hear it with perfect clarity of tone.

*Now the Price!* About half of what you expected, \$118.00, less tubes and accessories, (\$150.00 Denver and west.)

**THE A-C ELECTRICAL MFG. CO.**

DAYTON : OHIO

Makers of Fine Electrical Equipment for Twenty Years



### A-C DAYTON Knocked-Down Sets

The A-C DAYTON XL-5 can be purchased in knocked-down form, including all parts, with complete directions, for \$72.50—(\$78.50 Denver and west.) Write for descriptive folder.

Reputable radio jobbers and dealers will be interested in our sales plan. Write for complete information.



Type 201A

### AIRTRON RADIO TUBES

with the new highly developed dielectric molded Bakelite base which eliminates all kinds of electrical losses.

### AIRTRON TUBES

speak for quality, volume and all other characteristics demanded of a radio tube. Designed and manufactured to give the highest efficiency that a tube at the present time can possess.

- Type 200—6-Volt, 1 Amp. Detector.
- Type 201A—5-Volt, .25 Amp. Detector and Ampl.
- Type 12—1 1/4-Volt, .25 Amp. Det. and Ampl.
- Type 199—3.4-Volt, .08 Amp. Det. and Ampl. Standard Base.

**Every Tube Guaranteed**

**List Price, \$4.00**

Sold by all dealers, or shipped C. O. D. direct by Parcel Post. When ordering mention type. Discount to Dealers

## H. & H. RADIO CO.

Clinton Hill Station, Box 22, Dept. 103, Newark, N. J.

**We Are Still Repairing All Types of Radio Tubes at \$2.50**

KSAC over radio are not matched for excellence in quality of material, authoritativeness and interest by any similar courses offered in any college of the world.

"Agriculture occupies two evenings on the extension radio program. A discussion of the essentials in the feeding, care and management of dairy cattle, and the handling, testing and marketing of dairy products is emphasized in one of the dairy courses. The salient points in judging poultry for egg production and standard bred characteristics, how eggs of high hatching are produced, how culling is done, the essential points on marketing, feeding and other timely problems of interest will be discussed under the head of Poultry Production. "In the Horticulture course there will be suggestions in regard to select-

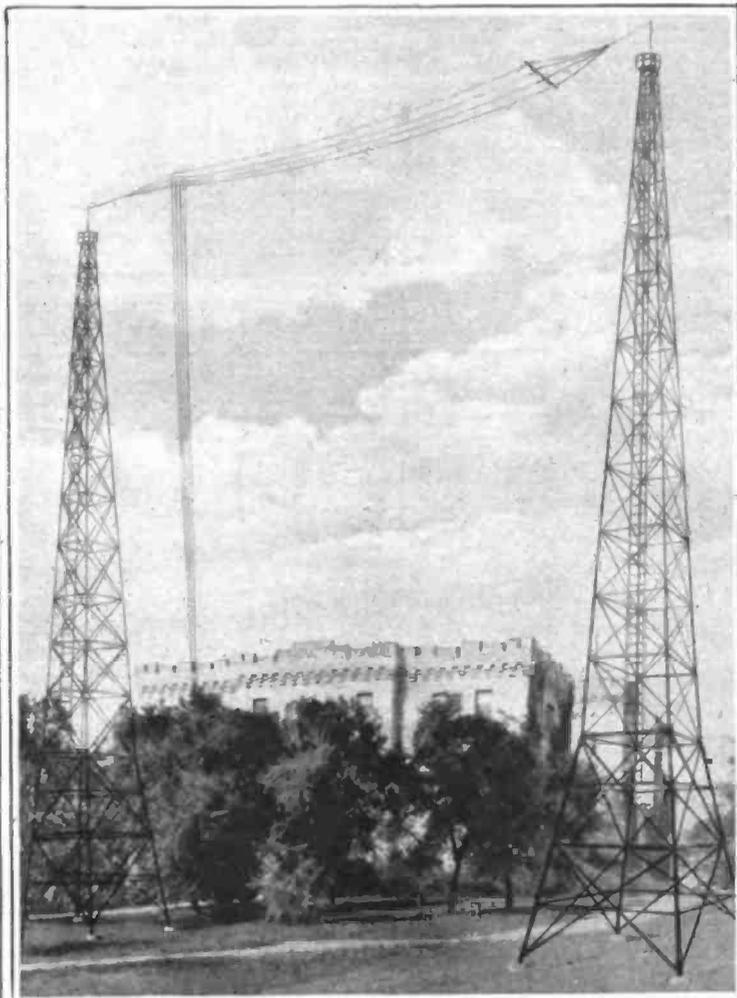
est. Under the head of timely topics extension specialists will furnish advice regarding control of disease epidemics among livestock, recommendations for handling outbreaks of insects and controlling of plant diseases, give discussions on marketing conditions, and disseminate new farming facts as they are found by the experiment station.

"Please pass the good news along to your friends.

"The principal says it's time to take up school. Stand by for Prof. Davis. He will now tell about the business letter.

"And say, folks, don't forget the football game next Saturday afternoon."

Perhaps a few letters from among the thousands received from families



When the college courses are switched into the "big classroom." The 160-foot towers located on the brow of College Hill are new landmarks of educational progress

ing a site and soil for nurseries, the selecting varieties, the procuring and setting of plants, spraying, cultivation and care in marketing. Handling hotbeds and the forcing of plants will be discussed in time to help the gardener in the early spring.

"Under the head of Botany, there will be a discussion covering the relation of weeds, grasses and pasture management, plants poisonous to livestock, agricultural seed, effect of bacteria and moles in the dairy industry, the use of yeast in baking and the damage caused by fungous and bacterial diseases of plants.

"The short courses are scheduled for seasons of the year when the information will have most direct application. Lectures on baby chicks, canning, treating potato seed, marketing, insect control, and similar timely subjects will be broadcast when the demand for such information is great-

scattered over the United States will give an even better idea of the popularity of the "College of the Air." Here are a few of the things they write:

"Your 'College of the Air' program comes in like a battery of eight-inch cannon up here. Your educational talks are the missing link in radio.

"Albert Montgomery, Greenleaf, Kan."

"Talk about getting something for nothing. We sure do when we tune in on KSAC. If all the farmers knew what they were missing by not having radios, they would regret it.

"The programs are fine; keep up the good work.

"A. H. Eberle, Madison, Kan., R. 4."

"Your 'College of the Air' enables us to learn the newer methods of doing things, especially farming. We

(Continued on Page 62)



List of Leading Articles Which Appeared in  
**RADIO IN THE HOME**

FROM OCTOBER, 1923, TO SEPTEMBER, 1924, INCLUSIVE

**REDUCTION IN PRICE OF BACK ISSUES**

To conform with the reduction in the subscription rate all back issues are reduced to 10 cents per copy, or \$1.00 for the twelve issues.

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**THE RADIO KINDERGARTEN SERIES**

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Lesson No. 5.....	1924	Feb.	22	Lesson No. 11.....	1924	Aug.	16
Lesson No. 6.....	1924	March	20				

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**RADIO IN THE HOME,**  
 608 Chestnut St., Phila., Pa.

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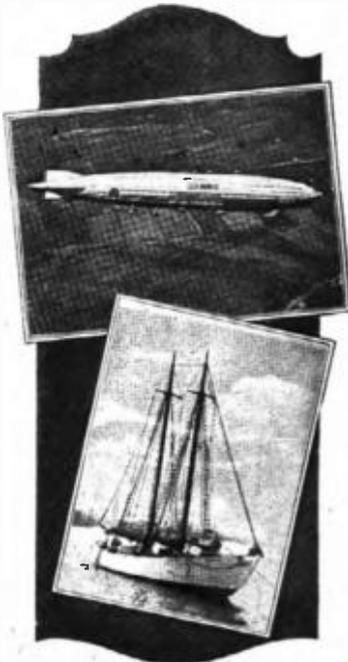
Enclosed find \$1.00 for which please send me the 12 consecutive issues of **RADIO IN THE HOME**, from October, 1923, to September, 1924, inclusive.

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# Further Adventures of BURGESS RADIO BATTERIES



U. S. Navy  
The Shenandoah is Equipped with Burgess Batteries and MacMillan Carried them to the Arctic

If the quality of any product may be judged in part by the standing of its users, surely Burgess quality must be considered unusually high.

Burgess Radio Batteries are found where there's need for the most efficient batteries made—in emergencies where failure brings disaster—with explorers in far-off lands—with the unsung heroes of the air service—beneath the seas with the crew of the submarines.

**"ASK ANY RADIO ENGINEER"**

Send for the Burgess Radio Company. Surprising—amusing and interesting to the entire family. Sent free of charge from 179 Burgess Engineering Bldg., Madison, Wis. Write for it.

**BURGESS BATTERY COMPANY**  
Engineers BATTERY MANUFACTURERS  
Flashlight - Radio - Ignition - Telephone  
General Sales Office: Harris Trust Bldg., Chicago  
Laboratories and Works: Madison, Wis.  
In Canada: Niagara Falls and Winnipeg



## Inverse Duplexing the Pfanstiehl System

(Continued From Page 31)

transformers. We have stated definitely that this does not mean the Jefferson transformer is the best on the market nor, conversely, that it is the worst. It simply means that, in all of our earlier experiments with the inverse duplex system, we found that the use of Jefferson transformers of the types specified in these articles gave a rather wide margin of variation in the by-pass condensers and, therefore, were less liable to cause unsatisfactory performance in case the fixed condensers which the reader had were not of the exact values indicated. In other words, our values

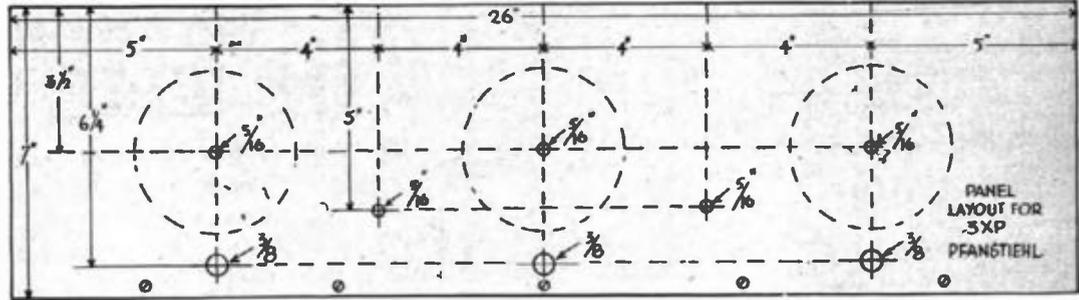
in answering correspondence that we felt that the best service all around was to tell in each of our articles the makes of apparatus which we found satisfactory and to indicate, where this was the case, that any other standard piece of apparatus of equal value would function in the same way.

When I say "standard makes" of apparatus I mean the makes which you will find advertised in this magazine. This is not a boost for our advertisers. It is simply the result of the policy which we established in the first place of not accepting any advertising of any apparatus which did

because we happened to have one, but we would have used the Carter just as readily if we had had that. Either one is absolutely standard.

We used Pacent jacks and Pacent rheostats and any other of the standard jacks or rheostats would have done just as well.

We used Benjamin sockets and any other socket will do, but the Benjamin was used in this set for one particular purpose—and that was to avoid the "microphonic" tendency of tubes. This tendency is made manifest when you hit or knock the table on which the radio set is installed and get a loud



of by-pass condensers are set for the Jefferson transformers.

Unquestionably, other makes of transformers of approximately the same ratio will function equally well if the correct values of by-pass condensers are figured out. That, however, is a big job which it is not fair for you to ask us to do. We are perfectly willing to help in any way with the successful functioning of this set, but we cannot be expected to build an entire new set using the parts which you have on hand simply to save you the trouble of arriving at

Here is the panel layout

not first pass very thorough tests in our laboratory at Station 3XP. Many of my readers may be interested to read my editorial in this issue which deals with this subject and some rather interesting side lights on it.

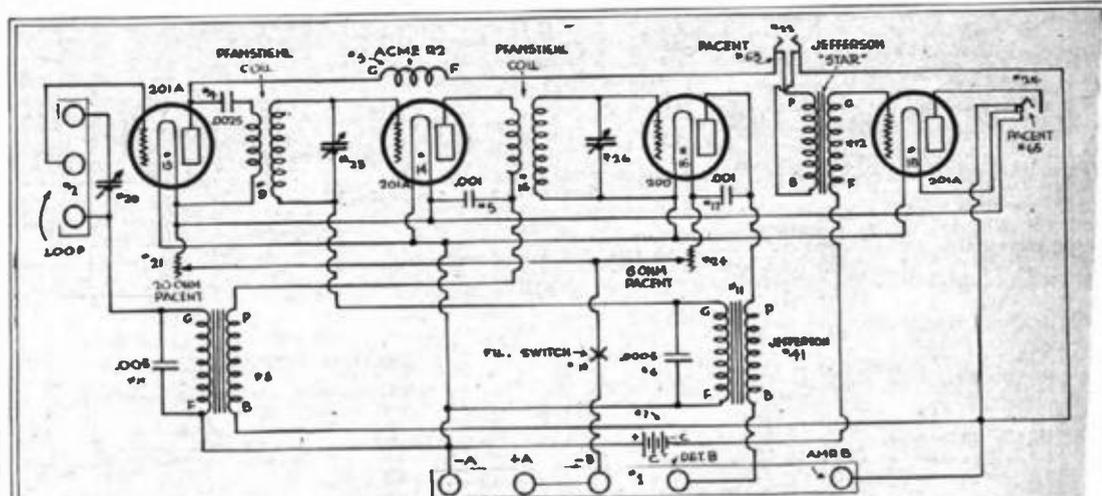
To get back, now, to this particular set.

The photographs which accompany this article are of an inverse duplex arrangement of the Pfanstiehl system which we built at Station 3XP for exhibition in our booth at the various

and unpleasant ringing noise in the loud speaker.

Heretofore it has been advised that the amateur mount his sockets on sponge rubber. The Benjamin people, however, have made a socket on which the shaft is mounted on springs so that the tube is virtually suspended on these springs and they take up any shock which may come in this way. This socket is very fine in avoiding the microphonic effects either of the 201A tubes of the UV199.

Very little need be said about hooking up this set further than the usual



### Inverse-Duplex with Pfanstiehl Coils

HAMMERLUND VAR. COND. BENJAMIN SOCKETS EBY BINDING POSTS  
DUMBLIER FOLD COND. NATIONAL 4" DIALS CELESTINE WIRE

the correct values yourself when you do not use the parts which we do.

We have specified parts in all of our more complicated hook-ups simply for the benefit of the reader. There has been such a great multiplicity of makes of various apparatus on the market that many of our readers seemed to be puzzled what to use. They would write and ask us if they could use this or that make of transformer or condenser, and these questions gave us such an enormous job

radio shows. It was first seen at the New York show at Madison Square Garden, and has since been seen at the other shows. This set is the one which has given us such surprisingly beautiful quality of reproduction.

In this set, we used three Hammerlund .0003 variable condensers because they matched the appearance of the other parts of the set. Any other good .0003 variable condenser will do in place of these.

We used the Yaxley filament switch

check-up list to supplement our style wire-ups.

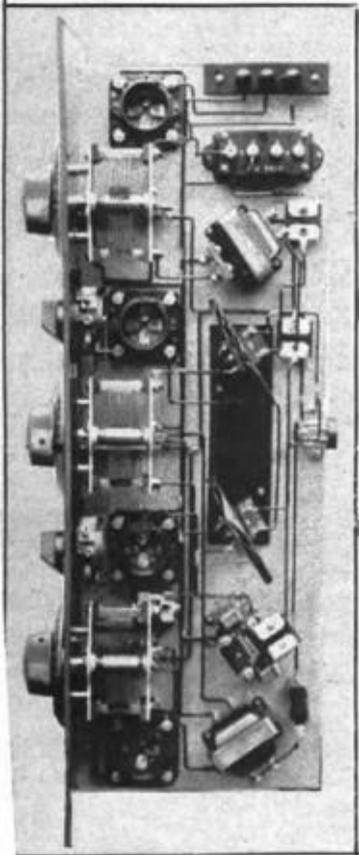
Everything that I said in my month's article about the inverse duplex neutrodyne will apply to set with the exception of the back of the neutroformers. The antenna which I very thoroughly scribed and pictured there is the one which we use with this inverse Pfanstiehl and find to be absolutely satisfactory. The same hints last month for the use of an o

aerial with this loop will also apply here.

I advise you also to read my September article on the inverse duplex neutrodyne because many of the hints there given are applicable to this circuit.

Many have written me pointing out what they thought was a mistake in the original drawing in that I showed no wires connected to the primary of the radio-frequency transformer. No connection is made to these two binding posts. The secondary of this transformer is used merely as a choke coil in the plate circuit of one of the tubes and the primary is not used at all.

Once more we are specifying the very fine Celatsite wire for hooking



Looking down on the baseboard

With this set, although any bus wire will do, or, indeed, ordinary bell wire will answer the purpose if you care nothing about the appearance of your set. Our exhibition set, which is going through rounds of the radio show, we used brown covered Celatsite, and everybody who saw the set spoke particularly of the beautiful appearance that this gave.

And now to come to what most demerits seem to regard as the most valuable part of this system of wiring—which we have termed the 3XP method of wire-up. The important part of the check-up list.

Even the best of workmen, working from even the best of diagrams, forget a wire on one step of the operation or will inadvertently connect it to the wrong place, and the set will not operate. By means of a check-up list, such mistakes are quickly found and rectified.

We have, heretofore, advocated building the entire set first and then having some friend read off these check-ups to you while you go over the set and see that everything is all right. I have since been convinced of a better method of using them: do the step of wiring shown, for instance, in Diagram 2, and then, yourself, go over the check-up list in Diagram 2 and see that you have

WORKRITE RADIO SETS WORK RIGHT



## “Can we get those blues from Memphis?” “Easy! Just turn the dials to 64, Mary, and we’ll have ‘em right away.”

You never imagined that radio could be so sure—so simple to use. Just think! Once you’ve tuned in a station with WorkRite Super Neutrodyne Receivers, you can turn to it instantly, at any time, simply by referring to your “log.”

Select what you want to hear from the Daily programs—and know in advance that WorkRite will get it for you—clear as a bell, with no loss of quality, richness or brilliance, and free from distracting howls or whistles.

WorkRite brings in distant stations—not just once in awhile—but regularly and distinctly on the loud speaker. Under favorable conditions, it will bring in broadcasting from across the continent.

### Amazing Selectivity

There’s another great WorkRite advantage that you’ll appreciate. It’s this. No matter how powerful your local stations may be, you can easily tune them out and bring in other stations using practically the same wave length.

The first time you use one of these beautiful, companionable sets, you’ll think it’s almost magical. But, there’s really no secret to Work-

Rite’s remarkable range and selectivity. They are due largely to two things. First—WorkRite’s ingenious Super Neutrodyne “hook-up.” Second—the way WorkRite is built—the fine materials that go into every set—the intimate, careful attention given to every detail of manufacture.

### Already Tremendously Successful

WorkRite has already won a host of enthusiastic friends. Dealers in many cities find themselves pressed to meet the demand for WorkRite. So, if the store you visit is unable to demonstrate WorkRite for you, write us and we will send you the name of a store that can. Or, if you want to know more about WorkRite sets before you see them, mail the coupon below and we will send you a beautifully illustrated rotogravure folder giving full information on all WorkRite models.

By all means, know what WorkRite will do. It would mean so much to you and your family—a new delight, a fresh treat, every day.

THE WORKRITE MANUFACTURING COMPANY  
1234 EAST 10TH STREET • CLEVELAND, OHIO

Branches: Chicago, 488 Lake Shore Drive; Los Angeles, 622 Maple; San Francisco, 1010 Market St.

DEALERS—If you don’t know about WorkRite Super Neutrodyne Receivers, by all means write us immediately for full particulars.

# WORKRITE

## SUPER NEUTRODYNE RADIO SETS

### WORKRITE AIR MASTER

Like all WorkRite models, this is a 5 tube set, enclosed in genuine brown mahogany cabinet with graceful sloping panel. Almost identical with WorkRite Radio King, shown in main illustration, except the latter has a loud speaker built into cabinet behind a handsome grille. Both furnished with plug and special cable carries all battery wires.

Prices: Air Master, without accessories, \$400; Radio King, without accessories, \$375.



### WORKRITE ARISTOCRAT

In this beautiful mahogany cabinet, the loud speaker with special horn and reproducing unit is placed on one side and compartment for A and B batteries on other side. All connections made inside with cable and plug. Front drops, forming arm-out for tuning or writing. Drawer beneath drop is provided for test sheets, etc. A set unsurpassed in any respect. Price, Aristocrat, without accessories, \$350.

Send Coupon for FREE Rotogravure Booklet

The WorkRite Manufacturing Co.  
1234 East 10th Street • Cleveland, Ohio

Please send me FREE a copy of the Rotogravure booklet which describes WorkRite

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

### A BIGGER AND BETTER BOOK AT HALF THE PRICE

## If GRIMES, of Inverse-Duplex Fame,

offered you his services for the price of a movie ticket—you would be interested, wouldn't you?

### But We Can Offer You a Better Bargain Than That

Would it be worth the price of a good dinner to you—to get the combined services and advice of such radio experts as — GRIMES — HARKNESS — NEELY — FLEWELLING — FOOTE — GOODREAU — etc.?

The services of the above mentioned experts cost us hundreds of dollars, but you can get the same

services for the trifling sum of \$1.00 (8½ cents per month), by subscribing to *Radio in the Home* for a year. (Twelve monthly issues.)

### SEND IN THE BLANK TODAY

RADIO IN THE HOME,  
808 Chestnut Street, Philadelphia, Pa.  
Please find enclosed check, M. O. cash, for one dollar (one-fifty Canada), (two foreign), for one year's subscription to *Radio in the Home*.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

## "B-T for Mine— for a Radio Good Time"

Says W. Phillips of St. Louis, on Sept. 3d, 1924, and adds:

"I am absolutely sold on the B-T tuner and condenser. I inclose a list of stations in all parts of the country to which I listened on the evening of Labor Day.

"I was indeed surprised to hear KGO at this time of the year, using only one stage of audio and the head phones. Had the family not retired, I could have put them on the loud speaker."

He is one of thousands who have known B-T products for originality and excellence and used them with the satisfaction found only in Quality.

Read this from Kansas City, September 11th, 1924

"As an engineer and electrician using radio as a hobby, I have used dozens of condensers, but none equal the B-T vernier. I have just built a well-known circuit and your condensers are the first with which I was able to get and hold stations while KC was on the air. The B-T excels anything I have ever used."

A. A. R. (615 Ewing Ave.)

He means the original B-T Vernier, designed two years before the magazines began talking "low losses." "It had the goods." It is still good—thousands will use no other.

And here's a Radio Magazine Editor:

"Tuesday evening, using a loud speaker and two stages of audio, we brought in practically every station worth while and at 2:10 A. M. tuned in KGO (Oakland) and held it until 3:05 with full volume. Such stations as Dallas and Springfield, Mass. came in easily without interference from the powerful Chicago stations. These stations have been brought in nightly, including KGO, showing that they were not accidents.

"Saturday evening, with Chicago stations on full blast, twenty-six outside stations were logged without any attempt to make a record."

150 m.m.f., 7 plates, \$4.55  
250 m.m.f., 11 plates, 4.50  
350 m.m.f., 23 plates, 5.95  
500 m.m.f., 35 plates, 6.4

He's Talking About  
1924 and the Products  
Pictured Here

Want to Know More?

Our circulars will tell you. Ask your dealer or drop us a line.

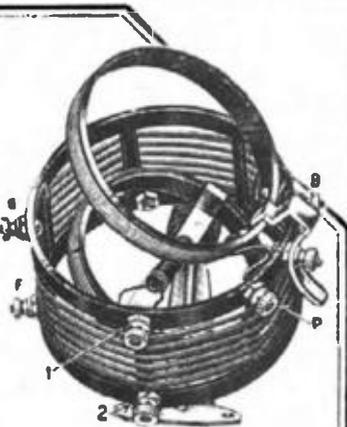
We Build Good Parts for Those  
Not Rich Enough to Afford  
Poor Ones

Bremer-Tully Mfg. Co.

538 S. Canal St., Chicago

The "B-T" is the first Low Loss Short Wave Tuner. Type SW covers 50 to 150 meters with a B-T 11-plate Type L Condenser. Type B covers 200 to 500—no tape in either case and price is

\$5.00



all of those wires placed correctly before you go to Diagram 3. Then when you finish Diagram 3, take the check-up list for that diagram and see that everything is all right on that step before you go on to the next one.

Several of our readers have written to ask us if it would not be possible, in these check-up lists, to indicate in each place whether some other wire would be attached to that same place in a later step. As one man put it, "It is irritating to do a careful job of soldering on a connection and then find out two or three steps later that you have to unsolder in order to solder another connection to the same place."

Well; that is just about doubling the job of getting up these 3XP-style wire-ups, but we have often said that the readers of this magazine are its real editors and if you want that added feature, it is up to us to give it to you. And so we are including that feature in these check-up lists printed with this hook-up.

So we will give the check-up lists now, and you should use them carefully as you go along hooking up the outfit.

Diagram 1—Layout of Apparatus

No. 1—Strip of insulating material with five binding posts on it. In our set, as shown in the photographs, we used the new Jones cable which has

No. 7—Ordinary "C" battery from 3 to 7 volts.

No. 8—Jefferson Star transformer. No. 9 and 10—Two Pfanstiehl coils mounted upon bakelite base.

No. 11—Jefferson type 41 transformer. No. 12—Jefferson Star type transformer.

No. 13—Socket for tube which is the first radio and second audio.

No. 14—Socket for tube which is the second radio and first audio.

No. 15—Micadon condenser .005.

No. 16—Socket for detector tube.

No. 17—Micadon condenser .001.

No. 18—Socket for tube which is third step of audio.

No. 19—Filament switch jack—either Carter or Yaxley.

No. 20—.0003 variable condenser.

No. 21—20 ohm. rheostat.

No. 22—Double circuit jack.

No. 23—.0003 variable condenser.

No. 24—6 ohm. rheostat.

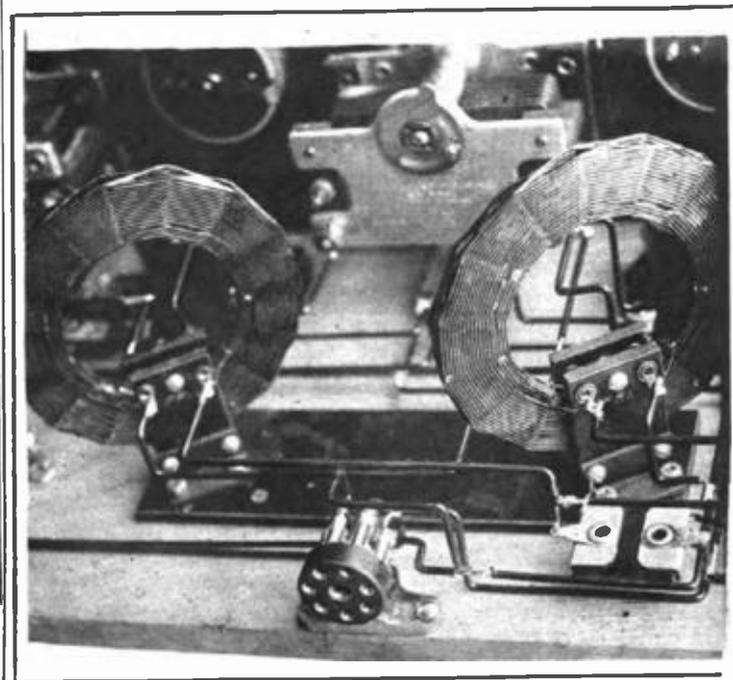
No. 25—Filament control jacks.

No. 26—.0003 variable condenser.

Diagram 2—Filament Leads

No. 1—Minus A binding post on block No. 1 (do not solder; another connection will be on here) to the top of jack switch No. 19.

From the bottom of jack switch No. 19 (do not solder; another connection coming) to minus filament on socket No. 13.



The Pfanstiehl coils and the Jones cable connector

all of these connections provided for, and connection for antenna and ground in addition. In the diagram, however, we are showing binding posts for those who do not wish to use the Jones cable. For those who wish to use the Jones cable—and we really think that it is a very convenient device—the connections are exactly the same and you will find the various connections marked on the cable when you buy it.

No. 2—Insulating strip containing three binding posts for loop.

No. 3—Acme or any other standard radio-frequency transformer. The plus B and the plate binding posts are not used. They are left blank. The filament and grid are used and in this way the secondary of the transformer is merely used as a choke coil. The secondary of a Ford spark plug would probably do as well, but would not look so neat.

No. 4—Micadon condenser .0025.

No. 5—Micadon condenser .001.

No. 6—Micadon condenser .00025.

From bottom of switch No. 19 (can solder now; no more here) minus filament on socket No. 14. not solder; another connection coming here.)

From minus filament on socket 14 (you can solder now; no other connection here) to minus filament socket No. 16 (do not solder; more connections come here).

From minus filament of socket 16 (still do not solder; another connection to come here) to minus filament on socket No. 18.

From positive A binding post No. 1 (do not solder; another connection to come) to blade connection rheostat No. 24 (do not solder; other connection to come here)

From blade connection of rheostat No. 24 (you can solder now) to connection of rheostat No. 21.

From the outer end of rheostat 24 to positive filament on socket 16 (do not solder).

From outer connection of rheostat No. 21 to positive filament of :

# WESTINGHOUSE

"A," "B" & "C" RADIO BATTERIES  
A Super-Service "A" Battery



This sturdy composition-cased 6-volt battery is as good as it is good looking. The one-piece case will not warp, leak or rot. It is rechargeable and therefore economical, and the Westinghouse quality built into it will return you years of service on your investment. The capacities are ample for all sets.

The complete Westinghouse line includes four sizes of 6-volt batteries in composition cases, a 6 volt, a 4 volt and a 3 volt "A" battery, a 6-volt "C" battery and three sizes of "B" batteries, all in one-piece glass cases.

Sold by radio stores and by Westinghouse Battery Service Stations.

THE WESTINGHOUSE UNION BATTERY COMPANY, Swissvale, Pa.

No. 14 (do not solder; three more connections to come).

From positive filament on socket No. 14 (still do not solder) to positive filament on socket No. 13 (do not solder).

From positive filament on socket No. 14 (still do not solder) to top blade of filament lighting jack No. 25.

From next to the top blade jack No. 25 to plus filament on socket No. 18.

**Diagram 3—Grid Leads**

From center binding post on block No. 2 to grid of socket No. 13.

From stator of variable condenser No. 23 (do not solder) to grid of socket No. 14.

From stator connections of variable condenser No. 26 (do not solder) to grid or socket No. 16.

From grid of socket No. 18 to grid of transformer No. 12.

From filament connection of transformer No. 12 to the minus side of "C" battery No. 7.

From the positive side of "C" battery No. 7 (do not solder) to filament connection of transformer No. 8 (do not solder).

From positive connection of "C" battery No. 7 (solder now) to filament connections of transformer No. 11 (do not solder).

From filament connection of socket No. 8 (still do not solder) to negative A binding post on No. 1 (you can solder now).

From the stator connection of variable condenser No. 23 (you can solder now) to the rear secondary connection of Pfantstiehl coil No. 9.

From the rotor connection of variable condenser No. 3 (do not solder) to the front secondary connection of Pfantstiehl coil No. 9.

From the stator connection of variable connection No. 26 (solder) to the back connection of the secondary of Pfantstiehl coil No. 10.

From the rotor connection of variable condenser No. 26 (do not solder) to the front secondary condenser of coil No. 10.

**Diagram 4—Plate Leads**

From the top (the one farthest from the framework) of jack No. 22 to the filament connection of transformer No. 3.

From the grid connection of transformer No. 3 (do not solder) to the plate connection of socket No. 13.

From the grid connection of transformer No. 3 (solder) to the left side of micadon condenser No. 4. (The other two contacts for the primary on radio-frequency transformer No. 3 are not used at all in this circuit. We simply use the secondary as a choke coil).

From the right side of micadon condenser No. 4 to the rear primary connection of Pfantstiehl coil No. 9.

From the front primary connection of coil No. 9 to the positive filament connection of socket No. 13 (solder).

From the positive connection of socket No. 14 to the rear primary connection of coil No. 10.

From the front primary connection of coil No. 10 to the right-hand connection of micadon condenser No. 5 (do not solder yet).

From the right-hand connection of condenser No. 5 (solder) to the plate connection of transformer No. 8.

From the left-hand connection of condenser No. 5 to the positive filament connection of socket No. 14. (This is the fourth connection here and you can now solder everything.)

From the plate connection of socket No. 16 (do not solder) to the plate connection of transformer No. 11.

From the plate connection of socket No. 16 (solder) to one side of condenser No. 17.

From the other side of condenser

No. 17 to positive filament on socket No. 16 (you can solder here now).

From the second blade from the bottom of jack No. 25—the one with the crook in it—to amp. B binding post on binding post block No. 1 (do not solder).

From the lowest or frame connection of jack No. 25 to the plate of socket No. 18.

**Diagram 5—"B" Battery Leads**

From the positive A binding post on block No. 1 (solder) to the minus B binding post on block No. 1 (solder).

From the B binding post on transformer No. 11 (solder) to detector B binding post on block No. 1 (solder).

From amplifier B binding post on block No. 1 (solder) to "B" battery connection transformer No. 8 (do not solder).

From "B" battery binding post on transformer No. 8 (solder) to the bottom or framework connection of jack No. 22 (solder).

From next to the bottom connection on jack No. 22 (solder) to "B" battery binding post on transformer No. 12 (solder).

From the next to the top blade on jack No. 22 (solder) to the plate connection of transformer No. 12 (solder).

**Diagram 6—Loop and Miscellaneous**

From the rear binding post on loop block No. 2 (solder) to stator connections of variable condenser No. 20 (solder).

From the front binding post on loop socket No. 2 (solder) to rotor connection of variable condenser No. 20 (do not solder).

From rotor connection of variable condenser No. 20 (solder) to grid connection of transformer No. 8 (do not solder).

From grid connection of trans-

former No. 8 (solder) to one side of fixed condenser No. 15 (solder).

From the other side of condenser No. 15 (solder) to filament connection of transformer No. 8 (this is the third connection and you can solder).

From grid connection on transformer No. 11 (do not solder) to rotor connection of variable condenser No. 3 (solder).

From grid connection of transformer No. 11 (solder) to one side of condenser No. 6 (solder).

From the other side of condenser No. 6 (solder) to filament connection of transformer No. 11 (solder).

From rotor connection of variable condenser No. 26 (solder) to minus filament connections of socket No. 16 (this is the third connection here and you can solder).

**The Dawn of a New Day for the Blind**

(Continued From Page 34)

behold! a radio set. But few blind people have the knack and the perseverance that Mr. O'Keefe displayed. Indeed, a good radio set is difficult enough for a sighted person to build, and this example shows what prodigies of achievement human ingenuity can accomplish.

The writer's acquaintance with Mr. O'Keefe unfolded his realization as to what radio means to the blind, and that realization is that radio means practically everything. (It meant so much that it appeared on the horizon as the dawn of a new day, the coming of a new-found sense.) Indeed, the writer became so impressed with the possibilities that radio offered to the blind that a nation-wide movement to provide radio sets for the blind has been the outcome of it.

A few months ago there appeared over the radio horizon the first faint

(Continued on Page 61)



**Both Must Be Musical Instruments**

**Model S Audiophone—\$25**

Rubber Horn 14½" diameter. Velvet mat finish of mottled bronze and gold; classic base.

If you are to enjoy the rich resonance of an old Cremona violin, your loud speaker must also be a true musical instrument. So designed and powered as to respond as faithfully to the inspiring crescendos of a Wagner opera as to the whispers of a Moonlight Sonata.

The new Bristol AUDIOPHONE does that. With its joyous, open-throated rubber horn, and its finely adjusted transformer, it is on a musical plane with the noblest instrument or voice at your favorite station.

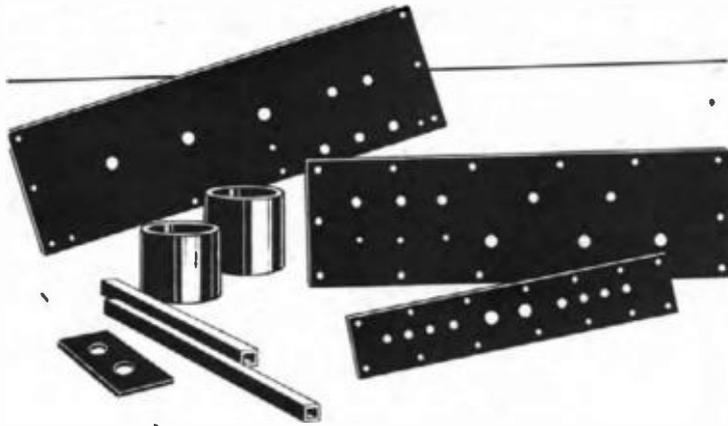
In addition to Model S, shown here, the Bristol line includes Model J, \$20; Baby Grand, \$15, and the "Baby" at \$12.50. Send for Bulletins 3011 and 3017-Q, mentioning the name of your dealer.

**THE BRISTOL COMPANY  
WATERBURY, CONN.**

# BRISTOL AUDIOPHONE

TRADE MARK REG. U.S. PAT. OFFICE

**LOUD SPEAKER**



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THE demand for Formica for radio insulation has forced the building of the largest plant in the world for the production of laminated bakelite - and the only plant in the world devoted exclusively to this one product. This year 60,000 feet of floor space have been added to assure everyone prompt service.

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Being one of the pioneer manufacturers in the radio industry, the Pacent Electric Company has long recognized that quality and

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- Jacks
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- Switches
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## The Slant of the Trade on Radio

### TREND IN NEW ENGLAND IS TOWARD THE COMPLETED RADIO RECEIVING SET

By G. P. ALLEN

New England Representative of Radio in the Home

BOSTON, MASS., Oct. 20.

DURING the past summer and, in fact, even at the present time, you can hear expressed in the Boston radio stores as many different ideas of the trend in radio as you care to listen to. If you stick around long enough the conflicting ideas make you dizzy. Have you ever gone the same way to work, to school, or to church, time after time, and then suddenly discovered a new building you never saw before? You know then that it must have been under construction for some time and you wonder why you hadn't noticed it. That is what has happened to me.

Every one is familiar with the moss-covered statement, "Woman's place is in the home. It is the woman in the home that has determined what radio in the home shall be this season. Last season it was considered very clever of John or Henry to be able to get music with a "mess of wires." But now John's wife and Henry's mother have seen the set Mr. Smith bought. "Mr. Smith doesn't know the first thing about radio and they get beautiful music!" "He doesn't get anywhere near the salary John does and if they can afford that nice-looking set I'm not going to put up with those dusty wires and things any longer!" "Besides I nearly break my neck on that wire running to the Victrola!" That is the "nigger in the woodpile" behind this season's market.

Figuratively it is no longer necessary to have driven a hundred miles with a licensed operator on the seat beside you, the way you do in Massachusetts to qualify for an auto license, in order to acquire the skill to run a radio set. The three and four story "apartment house" sets and those with dial-studded panels are on the bargain counters. The new Magnavox sets probably mark the extreme in the effort for simplicity. There is a decided improvement in the cabinet work and space is generally provided for at least the B batteries. Every effort has been made to make the set as unobtrusive to the eye as they have been noticeable before. There are built-in loud speakers and the "wire to the Victrola" is being taken care of in combinations of radio and phonograph in an attractive cabinet. Some models have the sets installed and others leave the space vacant to allow for the purchaser's particular needs. Yet the twist of a lever changes the equipment from phonograph to radio or vice versa.

These developments in themselves are not natural but they have had some rather far-reaching results. If you need a collar or a necktie you generally run into the first store you come to and ask for what you want, but when you need a suit or an overcoat you generally stop and look the market over pretty thoroughly before purchasing. Even then you only buy from a dealer you feel to be reliable. That is what has happened to the Boston radio market. Radio manufacturers have advertised extensively and the public has become educated to know the rheostats that are rheostats and those that are hay wire. So, if a fan needs a rheostat, he steps into the first store he comes to and picks

one up. On the other hand when he wants a set he "stops, looks and listens." Consequently the set market is confining itself to the radio departments of long-established firms of good reputation. If you ask to see the head of the radio department in one of the large department stores you are referred to the manager of the music department. Radio sets are a sub department, like phonographs, sheet music and musical instruments. The combination of phonograph and radio is handled by the phonograph departments of the music stores and the separate sets are not only found there but in the well-established electrical appliance shops. These are the reasons back of the statements by the larger stores that the public is buying sets and the counter-statement of the small stores that the public is buying parts.

Of course, good dealers in any line of business carry replacement parts for their merchandise, but the bulk of the parts business in radio is now being handled by the small shops. They are located on the street floor and with the counter but six feet from the door they are admirably situated to take care of the parts customer who wants to dash in and walk off with what he needs.

The semi-standardization of sets and the subsequent drop in price is putting out of the field the "friend in the business" who could make a set for you. One of them told me this week that with a dealer discount he could buy a set cheaper than he could make 'em and that if the factory set didn't work properly he could return it. With his own sets if they didn't work he had to fuss with them until they did or his time and material would be a total loss. Not only that but the multi-tube sets run into considerable money. In the large stores you see an unobtrusive little sign, sometimes 6x12 inches, more often smaller, on which it says, "Inquire about our general purchase plan." The neighborhood stores and the friend in the business can not get the financing necessary to do this and that is another reason for the set trade going to the larger stores.

WEEI, the new station of the Edison Electric Illuminating Co. is now on the air, replacing the less powerful WTAT, the former plant of the company. In their new building the Boston Chamber of Commerce has installed a public address system in connection with a radio system. Conventions, speeches, or music may be picked up in one part of the building and reproduced in any other or they may be transferred to any of the local broadcasting stations. Radio programs of unusual interest may be picked up by means of a specially designed receiver and distributed throughout the building by means of the address system. In addition to these two new installations Boston already has WGJ, WNAC and WDBR. Whether it is the abundance of broadcasting available, the difficulty of tuning them out with a single tube set, the battery expense of the tube sets, the many reflex sets involving crystals, a new crop of radio fans, or what else, I do not know; but there is a scarcity of the better grades of the nationally advertised crystals. Maybe it is a curiosity on the part of those who never had one to know what they sound like.

It would be nice to be able to tell you that the Super Regenerative Polydial or some other set is the leading one in this market at the present time. I can not. Similar con-

ditions to those that decide whether a man drives a Ford, a Buick or a Packard govern the set that is purchased. The increasing difficulty of erecting an antenna without interference from others and from phone and lighting circuits is naturally bringing a call for sets that operate on a loop. The reflex sets, while popular with the fans, are not very popular with the dealers on account of construction difficulties encountered by the customers and the greater information service necessary per part per sale. Gee! Did you get all that? The Freshman Masterpiece has received some publicity in the radio sections of the newspapers and one paper is running a series on the construction of the Crosey Trirdyn.

It would not be proper to close without mentioning the Neutrodyne and the Super-Heterodyne. The parts dealers and Radio Corporation agents are strongly in favor of the super-het. The parts dealers because it takes more parts and the Radio Corporation agents because of the price. One of my dealer friends expresses it as follows: "If you need more light in your living room and your landlord will not let you have a floor plug, by all means install a super-het."

**QUALITY AND ENTERTAINMENT NOW SELLING POINTS WITH PACIFIC COAST TRADE**

LOS ANGELES, Oct. 15.

PEOPLE who have been waiting to purchase receiving sets, expecting radical changes, now find that the early experimental stages are over. Skepticism has passed and those who were merely passively interested are now buying. Dealers are not selling, in this part of the country, with a big selling talk about DX, although local distance reception is claiming the attention of radio enthusiasts. Dealers are selling radio sets with three main talking points, namely, tone quality, local talent and entertainment value. Los Angeles now has two 500-watt stations, with a 5000-watt station on the way—KFI, KHJ, KJS, KFSG, and the new Los Angeles Express station which will be on the air by the time this reaches print. It is understood that the Express station will use the call letters KNX, which was turned in to Washington late in the summer when the California Theatre station closed.

KFPG is in process of installation for testing purposes by Garretton & Dennis, who took out a license several months ago. KFPR are the call letters assigned to the local forestry department station, but no news has been released as to the probable opening of the latter station.

There is a general feeling that the larger radio manufacturers will gradually work into the policy of fewer representatives if not exclusive territory. Too many manufacturers have given carte blanche to the trade with the result of price cutting, poor service, dissatisfied customers and other difficulties.

For some time the Kennedy people have adopted an exclusive sales district plan. It is rumored that the R. C. people will eventually adopt the same idea. With one or a few sales houses in each district handling a certain line the public is assured of proper demonstration and also that they will be served properly. Thus hardware stores, plumbing shops, the corner grocery and other establishments, without proper and adequate selling and service facilities, will probably soon be out of the radio game.

Fans are dusting off the shelves preparatory to the indoor winter sport. New books and magazines on radio are in the homes. New parts and accessories appear and everyone is ready for radio programs de luxe. And they'll get them. Huge winter publicity campaigns, renewed atten-

tion to local programs because of the intensely keen competition between stations are all felt at this time. Stores are taking back radio salesmen who were let out in July and dealer and fan alike await what the winter will bring forth.

With all the country-wide hulla-baloo about who is to pay for broadcast programs, Los Angeles has embarked upon its toll plan through KFI, the Radio Central Station owned by Earle C. Anthony, Inc. Through the toll station the paid artists will bring to the public real entertainment with the program paid for by commercial firms. True, the proposition is still in the experimental stage, but it is anticipated that other local stations will follow suit. Paid talent lessens the strain on the studio because the artists cannot nag about publicity when they are paid. Fans eagerly watch to see if there is a difference between the quality of programs on toll and non-toll stations, and the studios watch the idea with interest for other reasons.

The new KFI, of 5000 watts, is well under way with most of the Western Electric equipment on hand ready for erection. Visitors are temporarily barred from the studio until the new offices and extra studio are bricked in on the roof of the Packard Building with the grand opening scheduled for some time during the holiday season when a high array of talent from Hollywood and Los Angeles, together with representatives of official Los Angeles, will dedicate the new super-station.

Some of the local real estate subdivisions which have previously given huge band concerts on Sunday afternoons to announce opening dates are now having public address systems or loud speakers installed around the grounds and concert programs are picked up from various stations. Accompanying the air concerts is generally a big barbecue or basket lunch and, of course, the ever-present glib salesman.

It is claimed that the Model Grocery Company, of Pasadena, a large enterprising firm, is the first Southern California grocery to install a radio department. They are distributing the Eagle Neutrodyne.

Local dealers attest to the increasing popularity of the Harkness set. Parts are selling well as well as complete sets. The simplicity and ease of operation and the tone quality are putting the set on the market. The Harkness unquestionably was slow to gain headway on the Pacific Coast, but it is now gaining momentum every day.

Dr. Mars Baumgardt, often called "the radio astronomer," has done more to popularize astronomy than any other one person in Southern California. For more than a year his popular weekly half-hour talks from KHJ have been a feature. Through his messages and lectures thousands have become interested and all local observatories carried record crowds when Mars was nearest to this planet—the Carnegie Institute Observatory, on top of Mt. Wilson, for instance, having about eleven hundred visitors who looked through the gigantic telescope from evening until four o'clock the following morning.

It is announced that the new KFI, to be ready about the first of the year, will be on the air continuously from 12 o'clock noon until midnight. Commercial firms may hire the studio at prices ranging from \$100 for an hour afternoon program to \$250 for the same period on a Sunday night.

Radio orchestras of the month include Lada's Louisiana Five, Lawton's Syncopators, Fallon's Californians and Kennedy Broadcasters of Long Beach.

Arthur E. Schifferman, treasurer of the radio division of the Music Trades Association, is giving a series of weekly talks from the Examiner and bi-weekly from the Herald on the

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The fact that Jefferson Transformers are preferred for experimental work by many radio experts and authorities is a clear indication of Jefferson supremacy.

Proper amplification—perfect reproduction—clear, undistorted reception; that's the why and wherefore! To radio authorities the country over Jefferson means the utmost in transformer performance.

Jefferson Transformers are the result of twenty years' experience in the manufacture of transformers. To maintain a uniform quality every Jefferson Transformer is subjected to a series of exacting electrical and mechanical tests which must be successfully passed before leaving our hands.

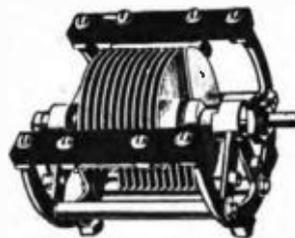
Jefferson Transformers meet matched construction specifications.

**JEFFERSON ELECTRIC MFG. CO.**

432 S. Green St., Chicago

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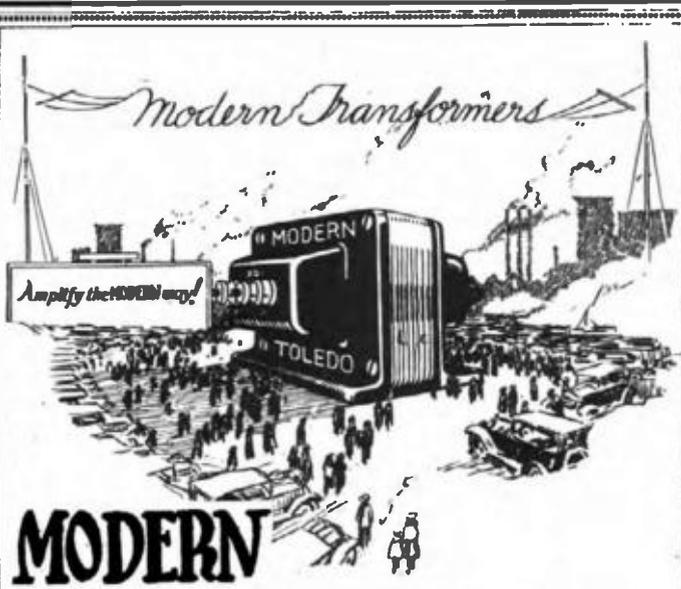
**ANNOUNCEMENT**

Mr. E. T. Flewelling, one of America's foremost radio engineers, inventor of the famous "Flipper Circuit" and now Associate Editor of RADIO IN THE HOME, is the designer of all Buell-Flewelling Radio Apparatus. Each instrument of our manufacture is personally approved by Mr. Flewelling before it leaves our factory. Look for his endorsement (stamped on the instrument) before you buy.

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The Flewelling design Low-Loss condenser ranks superior to all. Its rugged construction gives it the heavy duty performance necessary to a high-grade condenser of this type. Plates are extra heavy—1-16 inch. Will not warp out of alignment. Large bearing surface assures free action of rotor. Bearings, plates and "drag" on rotor are independently adjustable.

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Amplify the MODERN way!

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## "Push-Pull" Transformers Were First

—to be offered the Radio public. Today they are recognized as the last word in quality amplification.

## MODERN "Super-Six" Reflex

This is the peer of all Reflex circuits. It works on a loop. Months of laboratory tests were made before the MODERN Radio Frequency Transformers used in the "Super-Six" circuit were offered the radio world. The success and acceptance of this circuit have been instantaneous.

Every coil is wound in our own daylight plant on our own specially designed winding machines. Each transformer is triple-tested before shipping to insure satisfaction to the purchaser.

Full-size wiring diagram and complete constructional bulletin mailed on receipt of 4c in stamps. Be sure to specify whether you desire "Push-Pull" or "Super-Six" bulletin.

**THE MODERN ELECTRIC MFG. CO.**  
Builders of Transformers Exclusively  
Toledo, Ohio

Amplify the MODERN way!

## FREE RADIO EQUIPMENT

### Special Announcement

Due to the reduction in the subscription rate to RADIO IN THE HOME, to \$1.00 a year, the advertisement which appeared under the above title on the lower half of page 15 in the October issue, is now rendered obsolete. Exactly double the number of yearly subscriptions listed in that advertisement are now required to obtain the radio apparatus free.

For example, we listed 3 audio frequency Jefferson Star transformers as requiring 12 yearly subscriptions. Under the new rate of \$1.00 a year, you can get these transformers free by sending us 24 yearly subscriptions. You can estimate the number of subscriptions required for the other parts in the same manner, by doubling the number of subscriptions listed in the advertisement in the October issue.

You can earn any radio parts free by sending us subscriptions to RADIO IN THE HOME. You may be in need of condensers, couplers, transformers, homecomb coils, tubes or batteries; a loud speaker or a head set. You may wish to possess a tube-testing outfit, or a Grimes 3XP Inverse-Duplex set, or a Markness Counterflex set, or any other good standard set.

These sets and parts are available to you free of any cost in exchange for your help in introducing RADIO IN THE HOME to your friends and neighbors.

Let us know what parts you want, and we will tell you how many subscriptions you need to obtain in order to get the parts free.

At the new rate of only \$1.00 a year, you should find it comparatively easy to get subscriptions for RADIO IN THE HOME. The radio season has arrived and many subscriptions are to be had for the asking.

You remit the full amount collected with the names and addresses of subscribers, and ask for the apparatus that your subscriptions entitle you to, or you can continue sending in subscriptions until you have accumulated a large credit and then order the equipment you want against your credit account.

For additional information regarding our free parts plan write to

**Circulation Dept., RADIO IN THE HOME**  
608 Chestnut Street Philadelphia, Pa.

importance of purchasing sets from reliable and recognized dealers only.

The Metropolitan Theatre recently staged an act "Twenty Minutes in a Broadcast Studio," presenting the Evening Herald radio program presided over by the announcer, N. H. Hastings.

Because of difficulty in picking up U. S. stations broadcasting before ten o'clock in the evening, in New Zealand—there is a difference of 19½ hours—KGO, in Oakland, has changed schedule to present Henry Halstead's orchestra from the St. Francis Hotel four nights a week from 10 to 1, Pacific time. This enables radio fans south of the Equator, in the islands of the South Seas, New Zealand and Australia, to hear the U. S. on a regular schedule. KGO is coming in much stronger in Southern California than in the summer season.

The celebration of Mexican Independence Day from KHJ, The Times, included special noonday, afternoon and evening musical programs interspersed with brief speeches in Spanish and English. Jose Arias, and his Mexican Band, added much to the entertainment. They have played in Los Angeles over radio for more than a year.

The Los Angeles Record, an evening newspaper, has inaugurated a department for the criticism of local radio programs, claiming that it is in a strategic position to do so because it is the only Los Angeles daily without a radio station. Despite some success in the East, it is thought locally this idea will not be overly popular with the public. Radio fans are not so much interested to know about what was on the air as what will be on today and tomorrow.

The Radio Manufacturer's Agents' Association of Southern California is to be the first chapter in the National Radio Manufacturers' Association.

Radio weddings seem not to have lost their popularity in California. One was held at the San Francisco Radio Show and another in the Angelus Temple (KPSG) at Los Angeles. A year ago The Examiner staged a novel wedding for radioland also.

With the decision to make the new Anthony Station, KFI, a toll station—at least from the main studio programs—it is popularly rumored that one of the new stations to be erected, as well as one of the older ones, may follow suit.

The West Coast Theatres are now giving a series of radio programs weekly through one of the KFI remote controls, this being a part of the propaganda for the Greater Movie Season which was placed under way in the late summer.

With the opening of the fall term of school and college, radio courses are again in vogue. The Southern Branch of the State University has inaugurated a course in electrical measurements in which the class members will visit the larger broadcast stations. The Y. M. C. A. and local radio schools are also having courses.

## CLEVELAND DEALERS ADOPT TIME-PAYMENT SYSTEM FOR SALE OF RADIO SETS

CLEVELAND, O., Oct. 25.

THE sale of radio receiving sets on the installment plan appears to be finding favor with Cleveland dealers, judging from the number of offerings made in the advertising pages of the daily papers. With the acknowledged support of the Radio Corporation of America almost all dealers carrying RCA sets are placing all types with the public on the deferred-payment plan and appear to be satisfied with results.

As one dealer expressed it: "We are practically obliged to maintain our sets and installations when sold

outright and there is no particular difference or additional expense involved in giving this same service on installment purchases. We have no particular worry about the purchaser living up to his obligations and, as a matter of fact, the time payments are ordinarily kept up without difficulty. We believe this plan to be as applicable to radio-receiving equipment as to phonographs, pianos or any other article that is usually offered on this basis of sale."

This point of view, as given by one of Cleveland's largest retailers was confirmed by other dealers. The idea is perfectly logical and results in the sale of hundreds of high-grade factory-built sets that will give satisfaction to the purchaser and thus make converts of numberless prospective customers whose enthusiasm for radio has been dampened by hearing reception offered by home-made sets thrown together with indifferent skill. It is one thing to be entertained (?) at the home of a friend by the pride-of-the-family's loud-squealing collection of junk and another to bring in a concert from Los Angeles for the edification of guests.

This is not intended as a reflection on the ability of a very great number of people whose work and results equal that of many a manufacturing plant, but as a general rule there is utter absence of technical knowledge applied to the construction of the set and results that satisfy are obtained only because it is, in the final analysis, remarkably easy to construct a radio set that will work and no comparison is made with the high-grade and ultra efficient factory-built sets that produce results of exceptional nature.

The May Company, probably the largest department store in Ohio, offers a "Transcontinental" receiving set at \$49.75 on the basis of \$19.75 cash and \$10 a month.

Practically all of these sets are sold complete, that is, with aerial equipment, tubes and dry batteries, and it is worthy of note that UV-199 tubes are in universal use on these installment-plan offerings. This is, of course, logical, in view of consequent elimination of storage batteries and charging equipment.

Three of Cleveland's drug stores are now carrying radio equipment; Winger's, specializing on RCA parts and General Radio Company parts; Weinbergers, having a sales counter of radio goods operated by Mr. Leberman, of the Concert Radiophone Company, and the Marshall Drug Company, operating its radio counter as parts of its general business. Winger's are selling RCA sets on the deferred-payment plan.

H. Lesser & Co., probably the largest retail dealers in Cleveland, will operate five stores in Cleveland during the radio season, and have a radio store in Youngstown, O. Mr. Lesser looks for an exceptional business season and will carry a complete line of parts and kits, but states that the general tendency this year is toward factory-built sets. The Lesser Company will sell RCA equipment on the deferred-payment plan.

The radio pages of the Cleveland papers are carrying an unusual number of cards of small dealers and individuals who are offering to build and maintain radio receiving sets. Some are advertising their offer to build any type of receiving set that may be desired, furnishing the parts, and others are offering to assemble and wire sets for their customers. There is without doubt a remarkable increase in the number of radio dealers of one kind or another, but the established dealers view these newcomers with more or less pity. The radio business is seasonable to a degree, and while the season lasts there is room for all who can hang on, but there are a number of very lean months in the year that require real capital and established standing to weather successfully. This is no

reflection on those who come into the business, but it would appear that "many are called and few are chosen" to maintain their business the year through. The writer is advised of one concern which has in the neighborhood of \$100,000 worth of equipment either on hand or contracted for and would be glad to dispose of this stock for forty cents on the dollar, but is having a very real difficulty in securing any one to relieve it.

Competitive tubes are gaining ground in Cleveland, as evidenced by the increasing number of dealers who are stocking one kind or another. The H. Lesser Company is offering two kinds of the 201-A type, one at \$2.95 and another at \$1.25 and state that these tubes are giving satisfaction to users. The tubes of the Magnavox Company are distributed by the Republic Electric Company and by the Elliott Electric Company, both concerns handling a general line of the Magnavox products.

The RSK Company (Ridenhour, Kendig & Seaver) is distributing a line of tubes under the name of "Atlas" and has placed them with practically all the Cleveland radio shops. These tubes are sold under a thirty-day guarantee, during which time the purchaser may try them out to his entire satisfaction or return them for a refund of the purchase price or a new tube. Burned out filaments are expected, but any other trouble that may be found with the tube will be grounds for replacement or refund. Each tube is twice tested at the factory; once at time of assembly and again about ten days later to catch any leakage that may have occurred. The distributor claims that this precaution justifies the liberal guarantee that accompanies each tube, irrespective of type.

**FLORIDA NO RADIO HEAVEN; STATIC SOMETIMES FRIGHTFUL AND PARTS HARD TO GET**

By G. P. ALLEN

DAYTONA, FLA., Oct. 18.

WHEN one is in Florida he may say what he pleases about the part of Florida that he is not in at the time he is speaking. But let him get out of Florida and speak and the entire state arises with fire in its eyes to defend its name.

In Jacksonville it is all right to speak of mosquitoes at Ft. Pierce. In Ft. Pierce it is permissible to mention that it sometimes gets hot at Miami or Tampa.

But if a New Yorker says that it is hot and there are mosquitoes in Florida—Oh boys! Watch your step! So if perchance a Floridian should happen to see these remarks I'll admit that anything I say is wrong and without foundation in fact. That will save Mr. Neely and the Postoffice Department a tremendous amount of work.

I have seen in print that there is no radio in Florida. Far from it. There is radio in Florida, but it is radio under difficulties. (Dealers in Jacksonville, Miami, Orlando and Tampa are to pay no attention to these paragraphs.)

The average Florida town does not support a purely radio dealer. Radio parts and sets are obtainable, but they are carried as a side line to an electrical store, a music shop, or a garage business. If you want a transformer or a set of phones you can get them, but they are not the particular kind that you have in mind. Or you can get the kind you want but not the size.

So the dealer, who is doing his best to take care of you, sends to Jacksonville or Tampa for them. You wait a week and back comes a letter saying that they haven't what you want and are sending something else. I remember sending for Durantran radio-frequency transformers

and getting Day Fan tuned radio-frequency transformers. I sent for a Langbein and Kaufman variocoupler and got a Gilfillan. Jacksonville did not have a Bristol loud speaker, but New Orleans sent to the factory for one which I got two months later. Until recently a DeForest tube was not available.

The little niceties of construction, such as small screws, spaghetti, buss wire, etc., are as scarce as the teeth of the proverbial hen. I have paid as high as fifteen cents for a yard of buss wire.

All parts sell for list price or better. There are no cut-price stores. To people who live in the large cities this may seem strange. But we are far from the broadcasting centers. Any station to us is a distant station. So a set must be a tube set to get anything. Consequently the expense involved limits the field of the dealer and the number of sets. Where the turnover is so low the stock has to be kept low. Dry cells are more of an expense in Florida as they deteriorate rapidly on account of climatic conditions. Reception is good in winter. Pittsburgh, Newark, Springfield, Cleveland, Hastings, Philadelphia and New York all come in good volume with but little fading. The tourists bring their sets south with them. They vary in form from a one-tube regenerative to the super-heterodyne. Even the "tin canners" have some form of set with them.

In summer the static is troublesome. It rolls in a volume anywhere from the gentle patter of rain on a roof to the thunder of an infantry barrage. The text books call static "strays, atmospheric, and X's." What we call it isn't fit to print.

On account of the high static level the "super-het." is not very successful. Floridians are criticized as distance hounds. In the year I have operated a six-tube set there I have had a Florida station only twice. Further north each locality seems to be a dead spot for some particular station. But it seems as if Florida stations have trouble in being picked up in Florida. Seemingly the further away a station is the better we get it.

I though we had trouble with reradiation in Florida, but since I have seen Philadelphia's forest of aerials I am tempted to write the Epistle of St. Pete to the Philadelphians. It is strange to me with so many aerials parallel to each other and scarcely any distance apart, it is a wonder to me that any one gets anything.

My nearest radio neighbor is a block away and the next nearest is two blocks distant. Just think, we have been kicking about a fellow half a mile away who let his set squeal! It is kind of unreasonable isn't it?

There is a strong 60-cycle hum noticeable in my town from public service lines. All the wires are run on poles with transformers at the street corners. They use an electric pressure booster on the gas mains which is a very efficient transmitter. Generally it starts in the most interesting part of the program.

But when you consider that the only evening amusement available is the movies or dancing it is not to be wondered at that the Floridians fight through everything for their radio. In the winter the larger cities have their bands for the tourists and some of the cities have a concert program of the good artists. One city has a Forum and some of the cities get the road companies.

But the rest of the year it is good to be able to get Handel's "Largo" from the Skinner Organ Factory, the organ from Wanamaker's, jazz from the big cities and even the talks and market reports. Hastings is glad to get the wholesale produce market on account of their potatoes. Sanford is interested in the celery, lettuce, tomatoes, and peppers. The entire

**SIX TUBES**  
- single turn of the  
**SINGLE CONTROL**  
to the desired wavelength -  
the station **SNAPS IN!**

that's *Thermodyne* TFO

**14 Points of Thermodyne Supremacy**

- 1—Single Control
- 2—No Outdoor Antenna Necessary
- 3—No Directional Loop
- 4—Meter or Kilocycle Pickup of Stations instead of meaningless numbers
- 5—CANNOT Squeal or Howl
- 6—CANNOT Radiate
- 7—CANNOT Distort
- 8—Newspapers Give Time and Wavelength
- 9—Thermodyne Picks Them at Exact Setting Every Time
- 10—No Logging of Stations; Nothing to Remember
- 11—Stations of Different Wavelengths Cannot Interfere with Each Other
- 12—Three Stages Thermionic Frequency, Detector, Two Stages Audio Frequency
- 13—Distance, Volume, Clear as a Bell, Without Fuss or Excuses
- 14—A 180 Degree Turn of the Single Control is like an Instantaneous Tour of Dozens of Cities

The ONLY six-tube receiver to bring in any desired station with a single turn of a single dial to a single pre-determined number. Tone purity and clarity unmatched by any other receiver.

May be used with any type antenna, or, under favorable conditions, with none; with dry or storage batteries and with any make tub--

*In exquisite genuine mahogany cabinet with ample space for all dry-cell batteries.*

**\$140**

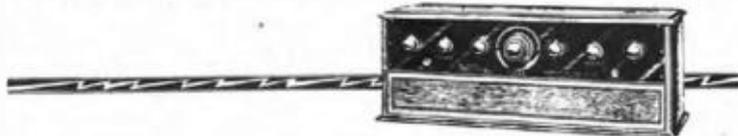
*Insist That Your Dealer Demonstrate Thermodyne*

MADE AND FULLY GUARANTEED BY

**SHEPARD-POTTER CO. Inc.**

Dept. H, 35 So. River St.

Plattsburgh, N. Y.



**RADIO IN THE HOME**

**A BIGGER AND BETTER BOOK AT HALF THE PRICE**

*Commencing with this issue the subscription rate to Radio in the Home is reduced to*

**\$1.00 THE YEAR**

Sixty-four pages of useful and interesting facts about radio every month from the pens of the greatest radio authorities.

**GRIMES—HARKNESS—NEELY—FLEWELLING—GOODREAU—FOOTE and Others**

*Subscription Order Blank on Page 47*

# HEATH Radiant

## NON-DIELECTRIC CONDENSERS

**DIELECTRIC losses reduced to insignificant minimum as required by the latest circuits. All-metal—only enough dielectric material to properly insulate rotor from stator element. Smooth, true-running shaft, like the jewel movement in a watch. Contacts independent of bearings — pigtail connections — insure NO LOST EFFICIENCY. Equivalent series resistance of only 0.1 ohm and a phase difference of less than one minute.**

**PERMANENTLY FLAT PLATES**  
The well-known Heath process of stamping rotor plates to lasting flatness, makes the new Heath a permanently satisfactory instrument.

**MICROMETER SEARED VERNIER**  
Ordinary adjustments reduced by separate geared adjustment to hairbreadth distinction. We guarantee the Heath Vernier Condenser to be more highly selective than any vernier condenser employing a vernier device which actuates ALL of the plates.

	With Dial	Without Dial
No. 12AV—12 Plates.....	\$5.00	\$4.35
No. 24AV—24 Plates.....	5.50	4.85
No. 44AV—44 Plates.....	6.50	5.85

PLAIN TYPES IN ALL SIZES

*Ask Now for Heath Sockets and Dials*

### HEATH RADIO & ELECTRIC MFG. CO.

205 FIRST STREET, NEWARK, N. J.  
Canadian Distributors: Marconi Wireless Telegraph Co., of Canada, Ltd.

## GLOBE

# \$5

in Canada, 57 Distributed by Otto Nigel Co., Ltd. Toronto, Canada

*One Model* *One Policy*

## Globe Phones—America's Best Headset, Regardless of Price

We challenge comparison with America's best known head-phones. Globe Phones always show up best where the opposition is greatest. And the quality is right to last for years.

There is long experience in making hearing aids for the deaf behind the amazing tone purity and reaching qualities of Globe Phones.

As beautiful as they are efficient. Leather covered head bands, heavily nicked parts, extra powerful magnets. If your dealer fails you, write us.

**Orders! Orders From All America**

The immediate wave of popularity which has greeted the 1924 model of GLOBE PHONES has been anticipated by greatly increased production. However, we advise early ordering to avoid possible delay of shipment.

Sales Department  
**The Zinke Company**  
1323 S. Michigan Ave.,  
Chicago

"Globe Helps the World"

Manufactured by  
**The Globe Phone Mfg. Co.**  
Reading, Mass.

Hear, even the Deaf!

state is interested in the citrus crop, and then there is also the melon crop.

Those of you who live near a broadcasting station should remember that except during the winter the "dinner concert" to us is a name only. The "talks to housekeepers," baseball scores, etc., are known to us from reading programs only.

On account of the distance there is no radio during the daytime. There is no morning concert to listen to while you are dusting, or an afternoon concert to while away a Sunday afternoon.

So if you have to wait twenty four hours for some part you want, or if during the summer you lose a few nights for static, remember there are places where people are worse off than you. Radio is hard to get for the small town in Florida, but it certainly is appreciated there when you get it.

### BIGGEST CLEVELAND HOUSE PREPARES FOR 100% MORE BUSINESS THAN LAST YEAR

By P. A. PRICE

CLEVELAND, O., Oct. 20.

"OUR business during the dulllest months of this year was 100 per cent in excess of that for the same period of last year, and, during the fall and winter months of 1924-25 we are looking forward to and making preparations for a 100 per cent increase over last winter's business."

So says Max Haas, president of the Haas Electric Sales Company, the largest distributor of radio goods in Cleveland. Continuing, Mr. Haas said:

"We have completed the issue of our 151-page catalog; we have increased our floor space; we have taken on additional salesmen and office help and are laying in a stock of goods that will enable us to take care of the customers from the five States that we are now covering."

The catalog issued by the Haas Electric Sales Company is a work of art from the printer's viewpoint and a mine of educational information to dealers and retail salesmen. Mr. Haas emphasized the importance of having intelligent men behind the radio counter. "The day is past when a clerk can qualify as a salesman because he has once built a single circuit tuner. The radio salesman of today must know the game; must be familiar with circuit requirements; must know what particular piece of equipment is best suited to the customer's needs and be able to tell why it is suited. The various radio journals are educating the public along technical lines and the individual who is building a seven or eight tube set knows generally what he is about and can consistently demand an equal extent of knowledge from the man who is undertaking to sell him \$75 or \$100 worth of apparatus."

It would be out of question to list the manufacturers represented by Haas, but it is safe to say that few of the biggest concerns are missing. It may be said that the offerings of all are impartially illustrated by excellent cuts and with a wealth of descriptive text. The catalog should fill a long-needed requirement of the retail dealer.

Storage battery tubes are holding their own, according to Mr. Haas, despite the suitability of dry cell tubes for use in neutrodyne and superheterodyne sets. The demand for tubes is good.

Storage "B" batteries are in greater favor, probably as a result of the heavy drain required by five and eight tube sets.

Of the more reasonably priced sets, Crosley offerings are in good demand; the "Trirdyn" leading, with the No. 51-P portable and No. 52 in respective sequence. Neutrodyne sets are moving slowly at present, with "Workrite" sets leading, but there is

a constantly increasing demand for Remler superheterodyne parts. The Baldwin Loud Speaker is the best seller in its class, and the Morrison Phonograph Adapter, since its reduction in price, is in good demand.

Indicative of the wide-awake nature of the retail trade, Mr. Haas has a letter from a Steubenville, O., dealer, asking for early shipment of "Super Ducons." The dealer saw the device in New York and gained immediate appreciation of its sales value. The distributor who is on the job will encourage his trade to attend radio exhibitions.

An arrangement of unusual interest to the radio-musical trade of Ohio was recently consummated by which the Ohio Musical Sales Company of Cleveland, J. R. Frew, vice president, is appointed by the Ware Radio Company as this company's jobbers for the State of Ohio, to handle the Ware Neutrodyne receiver.

The Willard Storage Battery Company report the necessity of working full time and full handed on radio storage batteries of both "A" and "B" type. Their forty-eight-volt CBR unit is having a nation-wide sale, two units to the customer being the rule. This battery has an output of 4.5 amperes, making it of particular value to the owner of neutrodyne and superheterodyne receivers. The Willard "A" battery, a storage cell designed to replace dry cells on heavy drain tubes, is well established with the trade and consumer. The Willard Company will shortly announce the appearance of a new type of "A" battery that will not supplant, but rather extend the usefulness of this type of storage battery for radio use. It is interesting to note that 160 broadcasting stations in the United States are now using Willard storage batteries for operating purposes.

The M. & M. Company says the demand is for better goods; that is, for high grade apparatus in place of cheaper make-shifts. The buying public has finally appreciated the fact that there are condensers and condensers and that the best is really the cheapest in the long run. This company was early in its understanding that good radio sales are encouraged by having good radio salesmen; men who can talk intelligently to the customer and promote the customer's confidence.

The M. & M. Company believes that this will be a superheterodyne year. The demand for Remler parts leads others, with Freed-Eisemann neutrodyne kits and factory built sets a close second. Zenith and Federal sets are in fair demand: Parts for the Acme reflex set are having a good sale.

The demand for tubes is good and was improved by the recent price reduction. Dry cell tubes are gaining, and the M. & M. Company believes that dry cells for "A" and "B" batteries are holding their own despite interest in storage batteries for the purpose. The "Brach" lightning arrester is in best demand, and a notable increase of interest in lightning arresters has been seen during the past summer, due, no doubt, to the many electrical storms that have visited Cleveland and vicinity.

The Atlas Adjustable Loud Speaker is probably the best seller, though a great deal of interest is manifested in the Western Electric Company's new loud speaker which is now on the market. The "American" brand of condensers are going strong, and "Acme," "All American," and "Jefferson" audio-transformers share almost equal popularity. Outside of "Acme" radio-frequency transformers for reflex circuits, no radio-frequency transformers other than those used for superheterodynes are in demand. Folding loop serials sell above the non-folding type.

"How I Built a Superheterodyne"  
(Continued on Page 55)

# WTAM

(Continued From Page 17)

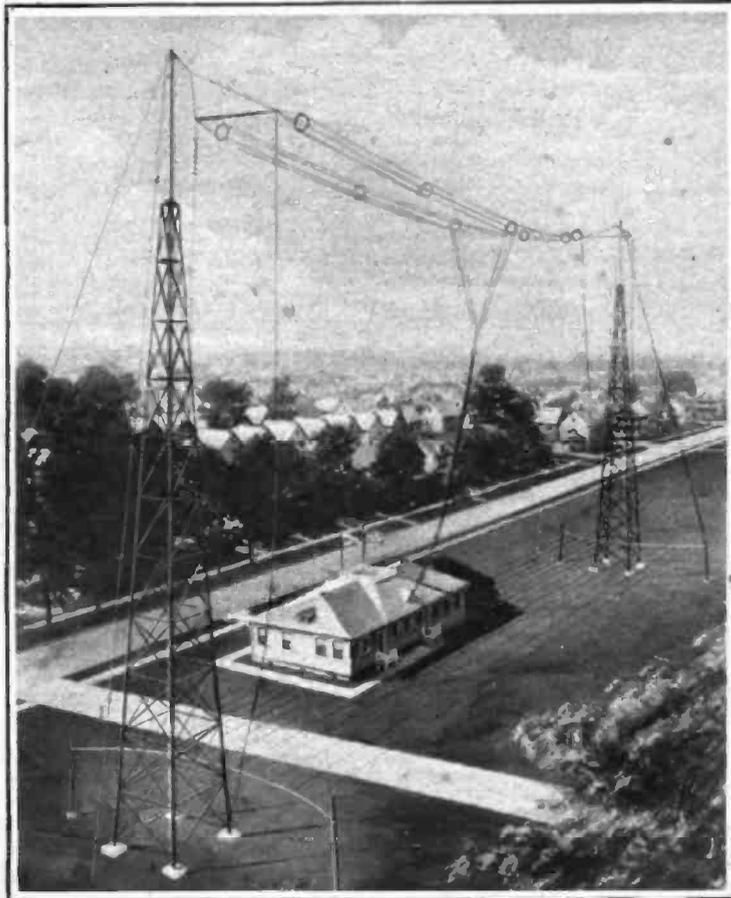
become famous wherever "The Voice of the Storage Battery" is heard. And it is heard a long way.

But fame is not reserved alone for Ev and "Rook." There are others in the orchestra, from Floyd St. Clair, "The Versatile Drummer," to Ned Orpin, "The Tuba Tooter," who play their parts with a nerve and verve that could not be put to better use.

"Art" Herske is the originator of the titles. Arthur Herske is announcer at WTAM. Some announcers are born, some are made, and some have announcing thrust upon them. Of such is Mr. Herske. He did not want to be an announcer; he had no yearning for the microphone. To be an electrical engineer and figure problems connected with plate areas

L. W. Zimmerman, Program and Studio Director, is a man of parts. Things theatrical and musical are his hobby and, though he has never appeared professionally, he might well be termed a semi-professional actor. He has sung several parts of Gilbert and Sullivan's famous "Mikado" and has produced the opera several times. He has sung in many other operas and has taken speaking parts in several plays.

By nature, L. W. Zimmerman is fitted for character parts; by voice it might be said that he is fitted to delineate any character—any shade or nuance of expression that might be required in his readings. His offering of that part of "A Fool There Was," in which "The Fool" laments,



Here is a view of Station WTAM, "the voice from the Storage Battery." The steel towers are 120 feet in height, and are topped by twenty-foot wood spars as an insulating factor. The aerial is of the T-type. A counter poise will be noted in the span between the base of the towers

and charging rates—that was Art Herske's idea of putting in the day. And planning a bungalow for Mrs. Herske and himself seemed the best way to while away the evening.

But Herske has a voice; also a personality that made him capable in amateur dramatics. So, when the Willard Company started their station and looked about for an announcer, Arthur's qualifications became the object of suspicion—a suspicion that made him the man for the job. Somebody was right; it appears that he was and is.

Mrs. Herske says that Arthur is a wonderful man and that he is an ideal husband. They have their bungalow in a pretty suburb of Cleveland, and, when Art is not doing stunts before the microphone after a day's work at the plant he is doing stunts with a lawn mower and spading fork in the garden. It's a great life.

decries and satirizes his own mis-spent life, is a work of art, so much so that another broadcasting station in Cleveland called upon him to render it from their studio. His readings from Service's poems—"The Shooting of Dan McGrew" and "The Cremation of Sam McGee"—are productive of a flood of applause that cannot be misinterpreted. Mr. Zimmerman's only fault is his modesty; his more frequent appearance would be appreciated by WTAM audience.

But he is always behind the scenes and the high quality of WTAM's programs, the excellence of the talent selected to entertain the listeners-in and the fact that these artists are called upon again and again to come before the microphone proves that the right man was chosen for the position of studio director.

Still further back behind the scenes, behind the elaborate equipment that goes to make up a broadcasting sta-



### Everything You Want in a Radio Set

**PERFORMANCE—BEAUTY—AVAILABILITY**—the three things you really want in a radio set, are offered to a new degree in the 1925 Operadio.

The efficiency of this compact receiver has called forth the highest praise—clear, natural tone, range, volume and selectivity, simplicity of operation and reliability under severe conditions.

In its attractive new case, the Operadio conforms to the most discriminating standards of good taste—harmonizing with the most beautiful surroundings.

DEALERS: The Operadio Sales Franchise is particularly inviting. Ask for details. THE OPERADIO CORPORATION, Dept. B, 8 South Dearborn Street, Chicago

And, in addition, the Operadio is so compactly designed that it may be readily carried to any part of the house, or easily taken along when travelling or visiting.

This set is entirely self-contained. No aerial, ground or outside connections of any kind required. A patented wave-bridge in the cover replaces the "loop" used on some sets. Loud speaker, six tubes, exceptionally large supply of dry cell batteries and all parts are fitted into the cabinet.

Write for an illustrated folder giving complete particulars.



## Loud Speaking Rubicon Duplex

When you raise your voice it doesn't get mushy. Neither should your loud speaker. RUBICON Duplex amplifies full tones without distortion—especially so when preceded by stages of Rubicon straight Radio and Audio.

"The Inside Story" tells why. This folder is a real help in buying transformers intelligently. You select according to test data—not just claims. Drop postal for your copy now.

**Duplex pairs tested for balance \$12**  
 Audio Frequency... \$6.00  
 Radio Frequency... \$6.00

**RUBICON COMPANY**  
 918 Victory Building Philadelphia, Pa.

## Flewelling Joins Our Staff

His famous circuit created a furore. It has been more blessed and more cursed than any other circuit. It is a marvel—a mystery—and the most fascinating and baffling enigma in radio. Mr. Flewelling has now designed a simplification and an improvement on this circuit. He is also getting ready to announce one of the most astounding discoveries in radio.

Mr. Flewelling is now one of our Associate Editors, and writes for no other publication.

# Folks/meet a friendly condenser

Dear Fred:

I didn't know what a real pal my Radio was until I equipped it with the Rathbun Superior Condenser. The single-hole-mounting feature certainly saves a lot of time and trouble. Thanks for the tip.

I'm driving to the city Sunday and hope I'll find you home.  
Your friend,  
Bill



You fellows who don't claim to know all about condensers may learn something worth while about a friendly condenser. You, too, may not know what a real pal your Radio set is until you equip it with a Rathbun single-hole-mounting Superior Condenser.

Compare 'em at your dealers or write [Radio in the Home] for complete details. Prices: "3 to 43 Plates"—\$1.00 to \$6. Rathbun Manufacturing Company, Inc., Jamestown, N. Y.



**RATHBUN**  
SINGLE-HOLE MOUNTING  
**SUPERIOR CONDENSERS**

Molded on every original single-hole-mounting low-loss unconditionally guaranteed Condenser

## Pure, clear tones from your speaker, must start with your transformers

You want more than noise from your loud speaker.

You want pure tones, clear, mellow reproduction.

But no speaker can be better than your A. F. transformers.

And any speaker will be improved when you use transformers that are designed for loud speaker use!

Transformers that produce the greatest possible amount of amplification unfortunately also introduce imperfections in the tone. And the speaker magnifies such imperfections.

Fortunately, however, when the tone is clear, you don't need anywhere near so much volume of sound.

In designing MAR-CO transformers, an amplification ratio has been used, which provides the most volume that is consistent with absolute purity of tone. And, of course, they are built, like all other MAR-CO parts, with the famed MAR-CO precision that stops leaks and conserves radio energy!

So, now, those who value tone purity highly, will use two and sometimes three stages of MAR-CO amplification this Fall, and replace squeals with music!

MARTIN-COPELAND COMPANY  
Producers, U. S. A.



RATIO  
3 1/2 : 1  
PRICE  
\$5.00

**MAR-CO**  
AUDIO RADIO FREQUENCY  
**TRANSFORMERS**

tion is S. E. Leonard, chief operator of WTAM. Upon him devolves the care and management of the electrical equipment and in this work he has the pride of the builder, for it was he, himself, who designed and built the station.

A navy radio man during the war, an operator and engineer, Leonard incorporated many of his own ideas and the result of his experience in the plans. As a result, the station equipment differs in many respects from other stations, but that it is efficient is attested by its twelve months of uninterrupted service and its standing among the most powerful broadcasting stations in the country. Looking back over his work Leonard may safely say that it was good.

C. C. Russell assisted Leonard in the construction of the station and assembly and hook-up of the equipment and won his spurs as assistant operator when the station was a baby. Two operators were not required at that time, but Russell was broken in to take charge should necessity arise, and later, when the station took on remote control broadcasting with three panels located outside the studio, Ross Plaisted was brought in from the Great Lakes, where he had been "Sparks" on several ships, and now the three men take turns at the station and at the outside panels. It is almost impossible to get these three men down to personalities in an interview, so the story of their lives must be unwritten, but as this is a characteristic of marine radio men we can forgive their reticence.

Reference has been made to the remote control equipment operated from this station. The Cleveland Plain Dealer, prompt in appreciating the mutual benefit to be derived from a community of interests, spared no expense in fitting up a studio in its office building and the Wednesday night programs through WTAM are arranged by the radio department of the Plain Dealer and broadcast from its studio. These programs have been carefully made up, and the best musical talent of Cleveland has been called upon to make them the success that they are.

Cleveland may not be the musical center of the country, but it has a number of excellent artists, some retired from public life on the vaudeville and operatic stage, others of social prominence whose appearance is largely a matter of personal acquaintanceship with those active in the management of WTAM and the Plain Dealer's editorial staff.

A feature of the Plain Dealer's programs has been the offering of talent from Ohio cities other than Cleveland. Akron, Wooster, Canton, Lorain, Alliance and other cities have been called upon to supply their best talent and have responded to the satisfaction of all concerned. All programs of this nature are broadcast from the Plain Dealer studio, using remote control from the WTAM station, eight miles away.

To make mention of all the contributing artists who have entertained the audience of WTAM would be to give a roster of Cleveland musicians and cannot be attempted. Some of those whose popularity is evidenced by the volume of applause appeared on the first anniversary program broadcast September 26th, and among them may be mentioned Florence Wasson, soprano; Dorothy Smith Lenz, contralto; Mildred Harter, soprano; Elsie Young, contralto; John Mainwaring, tenor; Arthur Parry, baritone; Robert Patrick, tenor.

Prominent among musical organizations that have entertained may be mentioned the Cleveland Male Voice Choir, directed by Albert Downing; pupils of the Walter Logan School of Music, and Carl Rupp and his Hotel Hollenden orchestra. Mr. Rupp, composer of "Arizona Stars" and other popular pieces of music that came into immediate favor, has often given the first public rendition of new com-

Tune in-  
with ease



**NA-ALD**  
**Super DeLuxe Dials**

Where eye and hand are in scientific balance

Test these dials with any other and see how much more quickly you can turn to any degree or fraction of a degree. Shorter intermediate lines, numerals on the bevel and a generous knob are the reasons.

These are truly beautiful creations which give that final touch of dignity and attractiveness to the quality set. On the set you buy look for the minute Na-ald trademark as you would for "Sterling" on silver.

75c. Other prices of Na-ald Dials are: 3 1/2" \$1.00, 3" 35c and 2" (reostat) 25c.  
**ALDEN MFG. CO.**  
Dept. T, Springfield, Mass.

**NA-ALD**

**\$25 FOR \$10**

**THE FAMOUS BEL-CANTO**

**Acoustical Amplifier**

Come to your home direct from the factory thereby **ELIMINATING THREE PROFITS—Distributor, Retailer and Dealer.**

This handsome Crystalline finished floor horn, 22" high, guaranteed for one year against mechanical defects of any kind, contains a distinctive adjustable loud speaking unit, assuring wide range of tone and volume. The base of cast iron insures stability, while all other metal parts are composed of highly polished aluminum.

No auxiliary batteries are required. Plug in direct on second stage.

**GUARANTEE**

Money back any time within ten days if dissatisfied. We further guarantee to the publisher carrying this advertisement that each and every speaker will be sold on the above terms and the instrument will be exactly as offered in this issue.

Send check or money order or pay postman \$10 upon delivery. We pay the carrying charges to any part of the United States or Possessions.

**FREE—RADIO LOGGING CHART SEND FOR ONE**

**BEL-CANTO MFG. CO.**

BENSEL-BOWEN, INC. Dept. B-11  
General Office and Factory 712 Broadway New York City

positions from the WTAM-Plain Dealer studio. Francesco De Leone, composer of the American Indian opera "Aligalla," that will this winter he heard in a dozen cities of the country, has played selections from this opera from this station.

To Harry Mount, radio editor of the Cleveland Plain Dealer, and to Miss Ruth King, assistant program director of the Plain Dealer studio, credit must be given for their share in making the WTAM-Plain Dealer programs the success that they have been. Mr. Mount's good judgment coupled with Miss King's wide acquaintance among Cleveland's artists has made a most happy combination.

Another pleasing feature of the remote control equipment has until recently been the daily dinner concert broadcast from the Hotel Statler, where Maurice Spitalny and his orchestra entertained the diners with programs of marked excellence. It is safe to say that the dinner hour in thousands of homes was brightened by this program.

Other remote control panels are installed in vantage points for entertainment of varied nature.

During the year of its existence WTAM has marked up some interesting records of various sorts. It was the first station in the United States to be received effectively across the Atlantic Ocean, having been heard in England and France before any attempts were officially made to cross the water by radio. And in the matter of applause, a long-distance telephone call from an enthusiastic listener in Los Angeles would seem to establish a record of that nature.

WTAM was successfully received a mile in the air by Wade Van Orman, pilot of the Goodyear III in the national balloon race, the balloon traveling over the State of Kansas at the time a concert was received. The station has been heard in the Mojave desert by engineers experimenting with radio reception in that famous "dead spot." Incidentally, WTAM was the most distinct station received during the course of the experiments.

Underground, WTAM has been heard a quarter of a mile within Mammoth Cave, Kentucky. On trans-continental trains WTAM programs are a regular feature for passengers on the Canadian Pacific, and on the two oceans, WTAM has been heard by the S. S. Leviathan on the Atlantic and was once picked up by a Pacific Mail steamer 8000 miles west of Vancouver.

S. E. Baldwin, advertising manager of the Willard Storage Battery Company, is manager of WTAM and in charge of its public relations. Associated with Mr. Baldwin is C. C. Andrews, who has charge of all matters of correspondence in connection with the station, relieving Mr. Baldwin of much of the routine work attendant upon its management.

John T. Vorpe and Bernard L. Strang are the publicity men connected with WTAM, both having a keen eye for a good news story and the ability of trained newspapermen to see that the story is put forth in entertaining manner. Mr. Vorpe handles the stories of personnel, the history and operation of the station and other matters of interest to purely radio publications. Mr. Strang, with his experience on metropolitan dailies, devotes his time to advance programs, studio happenings, personality stories about the WTAM artists and anything that will prove of interest to the general public.

With such a staff of trained men, each fitted to his particular part, and with a year of satisfactory operation behind it—operation that has brought entertainment of the highest grade to its audiences—the future of WTAM is assured, and it is the earnest wish of its thousands of friends that "the voice from the storage battery" may be heard long in the land.

## What an L+K Variotransformer Would Do For Your Set

*It Would:*

- give you the DX amplification of two fixed R. F. Transformers,
- make one tube do the work of two without reflexing.
- eliminate the condenser usually used across tuned R. F. transformers, and so close up many leaks,
- increase the selectivity of your set,
- and give you greater satisfaction over the full B. C. wave band.



VT-25 Variotransformer

Send for FREE DIAGRAM BOOK

showing complete "L + K" line and telling how to hook up the famous Greene Concert Selector and other standard circuits. (Jobbers and Dealers write.)

This remarkable unit gives almost unbelievable results when used with our Variable Clarifying Selector in the Lloyd C. Greene hook-up, but is a splendid addition to any standard set. Price, \$8.50. The Selector mentioned above is an aerial tuner that gives a most minute selectivity over the entire B. C. band. It is \$7.00. Ask at your dealer's.

LANGBEIN & KAUFMAN, Dept. R., 654 Grand Ave., New Haven, Conn.

**LANGBEIN + KAUFMAN L+K**

High Grade "Low Loss" Tuning Devices

A Guide to TECHNICAL ACCURACY

**HARKNESS REFLEX**

The circuit that put efficient radio within the reach of all. Mr. Harkness has now developed a still more efficient moderate-priced circuit known as the Harkness Counterflex. All developments of this system are new found exclusively in *Radio in the Home.*

**KENNETH HARKNESS**

is one of our Associate Editors, and writes for no other publication.

**THE RUBICON SUPER-HETERODYNE**

*The Ultimate in Radio*

Build your "Super" with the highest-grade parts and note the difference. RUBICON UNITS are correct in design, material and workmanship. Complete kits or separate parts supplied with full size diagrams and detailed directions.

Send for Particulars

**B. H. Wildermuth & Co.**  
4927 Locust St., Phila., Pa.

**IT'S FREE**

Want to know more about your Radio?

SEND FOR THIS BOOK OF DIAGRAMS, HOOK-UPS, LOG RECORDS AND MERITORIOUS DEVICES

Don't go ahead and buy your radio parts indifferent to the requirements which each should fulfill. This new Sterling Radio Book tells you why you need these devices and how you are going to improve the operation of your set inexpensively and effectively. It also shows valuable diagrams, hook-ups, and includes a handy log record. In it you will find

Sterling Pocket Meters  
Sterling Radio (Panel) Meters  
Sterling Microcondensers  
Sterling Audio, Radio and Intermediate Frequency Transformers

Sterling Rectifiers  
Sterling Rheostats

**THE STERLING MANUFACTURING COMPANY**  
Cleveland, Ohio Dept. J

# Sterling

Radio Equipment

# Fit for a King



Britain's greatest engineers in designing receiving equipment for his Majesty KING GEORGE V, chose Resistance Coupled Amplification. None other would do.

## RESISTANCE COUPLED

*The Aristocrat of Amplifiers*

A receiving set with this method of amplification will render the harmony of distant players as no other system could—even as if the receiver were not and musicians flung their symphony directly against the portiers of his palace.

## THE DAVEN SUPER-AMPLIFIER UNIT

As illustrated. Consists of a molded bakelite base 4" x 10" in which three tube sockets, all the necessary clips and binding posts have been combined.

Purchase from your dealer the Daven "RESISTOR MANUAL" by Zeh Bench. This manual contains the how-to-make-it data on Resistance Coupled Amplification.

Price 25 cents

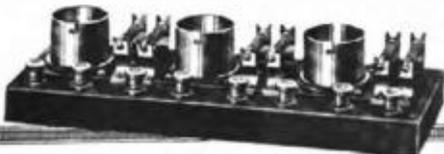
## Daven Radio Corporation

"Resistor Specialists"

New York

::

New Jersey



DAVEN RADIO

## RHEOSTAT TYPE 40



Embodying many new and original features. Solid Bakelite, of course. See it at your Dealer.

We beg the public's indulgence in our effort to supply them with our NOLOSS Pyrex and Isolantite insulated variable condensers. We are increasing our production facilities four-fold and hope to be in a position to supply the current demand by November 15th.

*General Instrument Products cost a little more but are worth infinitely more*

BOOKLET UPON REQUEST

## GENERAL INSTRUMENT CORPORATION

MANUFACTURERS OF LABORATORY EQUIPMENT

423 Broome Street, New York, U. S. A.

## The Slant of the Trade on Radio

(Continued From Page 54)

Set in Forty-eight Minutes" might be the title of a stirring radio story to be written by John Victoreen. Mr. Victoreen, radio engineer, and George W. Walker, sales manager, of Victoreen Radio, Inc., of Cleveland, were in Chicago in the interest of their "Hetroformer Kit," a recent development of a superheterodyne receiving set. They were about to close a contract with the Inland Electric Company, and, at the last moment the Inland people said they would have to see and hear the set in operation. The hour was 11:15 A. M., and the office closed at noon. Mr. Victoreen asked for a baseboard, two variable condensers, two grid leaks and condensers, eight tubes and sockets and some bell wire. These were provided, and in forty-eight minutes the set was in operation and the deal was closed.

The Inland Electric Company and C. W. Howe & Co., both of Chicago, are now distributing the "Hetroformer Kit" and contracts with other Chicago and New York distributors are in process of consummation.

Victoreen Radio, Inc., are building an air core radio frequency transformer for which they claim: (1) That it is the only air core transformer that does not cause interstage oscillations; (2) that their transformers have a resonant curve approximately 100 per cent sharper than that of any other radio frequency transformers and (3) that the curve of any two of their transformers is matched within one-third of 1 per cent of the other. This matched accuracy is obtained by a condenser built in the transformer and tuned to resonance across the secondary winding during process of manufacture.

On a recent test of this set by the Radio Editor of the Cleveland Plain Dealer, it was found possible to tune out the powerful local station, WTAM (390 meters), and bring in WGY (Schenectady) on 380 meters and to find a "silent" spot between the two stations, five meters from the wave-length of each. The writer has tuned in WOS with only a ground wire connection on this set. The 3400 meter wave length to which the transformers are wound makes for a noticeable absence of upper and lower harmonics of prevailing wave lengths. The set seems to function equally well with any type of tube because the transformers have an aperiodic primary that does not require matching with the plate impedance of the associated tube.

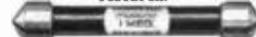
H. Lesser, of H. Lesser & Co., shares the spirit of optimism that marks the attitude of all Cleveland radio dealers. The Lesser Company's four stores provide an outlet for an immense retail business and business is good at all of them. Seventy per cent of the business is now done with factory built sets, with neutrodyne a close second. The Radio Corporation's "Super" is probably in best demand, but a good deal of interest is taken in that company's "Reflexo-flex" receiver, which except for its requirement of an aerial, is considered to be as good for distance and selectivity. The Lesser Company finds the "Fada" neutrodyne to be in excellent demand, and "Remember" parts for superheterodynes lead all others. Otherwise, the demand for parts is very quiet.

Mr. Lesser finds that he is selling three UV-199 tubes to every one storage battery tube, with a consequent increased demand for dry cell batteries. And speaking of tubes, this company has yet to find a satisfactory offering outside of the standard brands as put forth by the R. C. A., DeForest and Myra. "Something just as good" is offered daily and

## What Makes Metallic Grid Leak DURHAM NOISELESS



ANOTHER important advance in radio—the development of a practical METALLIC high resistance for grid leak and resistance coupling! This is the invention of two professors in chemistry and electricity at a large eastern university. The new DURHAM Metallic Resistance Unit is a rare metal deposited on glass by means of a complicated process developed after months of scientific research.



## Accurate - Permanent - Noiseless

Tested and guaranteed accurate, every DURHAM unit is noiseless and non-inductive. You can depend upon them absolutely. They are the biggest little things in radio. DURHAM Fixed or Variable Resistance Units (grid leaks) at standard holders. But you will find the new style base more convenient. Three styles take care of plain mounting, grid leak and condenser mounting and double base for resistance amplifiers.

Prices:—

Fixed, 25 sizes 50c-75c

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Get this Resistance Amplifier Booklet. Complete details for construction of the most perfect type of amplification. Coupling resistances and grid leaks for detector and two stages cost less than one good transformer. Send 25c for this useful booklet about the "biggest little thing in radio."

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1930 Market St., Philadelphia, Pa.

Canadian Distributors

DeForest Radio Corp., Ltd., Toronto

\$200

SELECTIVITY

\$850!

Make Every Night Silent!

THAT'S OUR GREAT ADVANCE

Selectivity — which is merely the ability to cut out interference — is the dominating difference between the very expensive sets and the moderately priced ones. Why pay \$50.00 to \$100.00 extra for increased selectivity when for \$8.50 you can get a FERBEND WAVE TRAP which will absolutely cut out any interfering station, no matter how loud, how close by or how troublesome.

Add a Ferbend Wave Trap to Your Set

You will find it a valuable addition. It is designed and manufactured completely by us, after years of careful engineering. It is not to be confused with imitations hastily assembled from ordinary parts. The price is \$8.50, plus a few cents postage. If you order, you can send cash in full, or we will ship postage prepaid, and we will give you a 10-day trial.

FERBEND ELECTRIC COMPANY  
25 E. Wacker St.  
CHICAGO  
Descriptive Folder on Request

FERBEND Wave Trap

## Make \$100 Weekly—sell RADIO

Demonstrate sure — repeat! — word-of-mouth sale. (Based on 1 part, lowest price, attractive four-tube instrument \$29.50. Big commission to you. Exclusive territory to proven salesmen. Territory selling fast. Write today for large illustrated book No. 100. Don't fail to give name of your county.

OZARKA, INC.  
224 Wash. Blvd., Chicago, Ill.



# CARTER

"IMP" Battery Switch

65c complete



Pat. 1-30-23 Actual Size

Again CARTER leads with a new and original quarter turn Battery Snap Switch—Compact in size; takes minimum space on back of the panel. Will carry ten amperes.

Indicates clearly when "On or Off."

One-hole panel mounting like CARTER Jacks—no spacer washers required.

Handsome moulded tapered Knob matches dials of Set.

Quiet in operation.

Complete with "On or Off" name plate, Knob and pointer.

Carter quality workmanship throughout.

Insist on the Original

Any dealer can supply

In Canada—Carter Radio Co., Ltd., Toronto



would be stocked if found to be satisfactory. The public appears to be satisfied with present standards and the reduced prices caused an immediate response.

The Carter Manufacturing Company is still working overtime to supply their now-famous Carco "Ham Special," the short-wave coupler that met with such an immediate response from amateurs. Short-wave transmission is being experimented with from coast to coast and the Carter Manufacturing Company has developed a shunt coil to be used in connection with the "Ham Special" that will permit operation on a thirty-five-meter wave length. It is evident that the Government, in extending the use of low wave lengths to amateurs, had a well-defined idea in view—that of stimulating interest and investigation in this interesting field. The average "ham" is a fiend for research work and it is safe to predict that remarkable and worth-while results will be obtained from some of the patient investigators whose equipment is set up in a dark and uninviting garret room.

Note: We use this Carco "Ham Special" in connection with our transmitters at Station 3XP with a vernier shunted across the secondary condenser. It sure brings 'em in!  
H. M. N.

Mr. Seabury, sales manager of the radio department of the Republic Electric Company, says that he finds dry cells holding their own against storage batteries. He has noticed no particular increase in the demand for tubes, but the winter business will, in his opinion, be thirty-five to fifty per cent better than that of last year.

The Republic Electric Company finds a good demand for the R. C. A. superheterodyne, with an almost equal demand for the Radiola 3-A. The Crosley "Trirdyn" is a good seller, as is that company's No. 51-P set. The Stromberg-Carlson Neutrodyne is, in Mr. Seabury's opinion, an ideal make of that system, a comment that was seconded by another distributor who does not handle this receiver.

Summing up the Cleveland point of view, it may be said that factory built sets, outside of the superheterodyne, are gaining over parts for home-built receivers; that the public wants the best of parts when they are bought, and that this will be a neutrodyne-superheterodyne winter, whether home or factory built. Dry cell tubes are making a slow gain over storage battery tubes, but the storage battery has not supplanted the dry cell for "B" battery use. A reasonably priced source of "B" battery current to be derived from the lighting circuit of the home will probably meet with an immediate response from every one who has a set.

## MARKET REPORTS ARE VITAL TO MANY, SO DON'T CUSS WHEN YOU TUNE 'EM IN

PHONES: "Good evening everybody! How are you all tonight?" Phan: "Oh raspberries! There is that old fool again with the cattle market. What the Sam Hill any one can see in that junk I don't know! Well, we might as well save the batteries. It will be half an hour before he quits."

How many times have you said that? A good many I guess!

But have you ever considered the other fellow? Suppose for a moment that you raised cattle, or hogs, or corn. Wouldn't you be interested in knowing whether you were going to ship into a high or low market?

Suppose that the price of hogs determined whether you could go to college next year,—or suppose that a good market meant that you could go south next winter and escape some

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now brings you the **SELECTIVE REFLEX** with **NEW POWER**



Self-Tuned  
Radio Frequency Transformers  
—Wound to Suit the Tube

OUT of a year of many experiments and numerous failures in broad tuned radio frequency amplification has come a far-reaching discovery. Radio Frequency Transformers must be adapted to the characteristics of the tube.

Out of that all-important discovery the ALL-AMERICAN Laboratories have developed the SELF-TUNED TRANSFORMER, bringing with it a Reflex with power such as never before seen. Out of the same series of researches has come an unprecedented selectivity, made possible by the new All-American Universal Coupler.

All of this excellence has been built into the new ALL-AMAX Knocked-Down receivers. They come complete with drilled panel and baseboard; you can put either of them together, with screwdriver and pliers, in one delightful evening, and "tune out the locals" before midnight.

ALL-AMAX JUNIOR (1 Tube).....\$22.00  
ALL-AMAX SENIOR (3 Tube).....\$42.00

Ask your dealer!

All Americans—Precision Made for Reliability  
Largest Selling Transformers in the World

The most valuable radio book ever published. Send for your copy—10 cents, coin or stamps



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# ALL-AMERICAN



# Bestone V-60

BEAUTY, CLARITY and CONVENIENCE. The tonal qualities of the BESTONE V-60 Five-Tube Receiver are perfect, without SQUEALS, HOWLS and WHISTLES. As for Distance and Volume, the Bestone V-60 compares more than favorably with any other Receiver on the market today.

Write for Particulars  
Manufactured and Guaranteed by  
HENRY HYMAN & COMPANY, Inc.  
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In beautiful distinctive cabinet with built-in loud speaker and battery compartments.  
**\$165.00**



Same receiver in other cabinet without loud speaker.  
**\$115.00**

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Complete Parts, Including Panel and Celatsite Wire ..... **\$55**

## SPECIAL! NEELY 3XP TUBE TESTER

This reliable tube tester, complete, in cabinet with engraved panel—an exact duplicate of the tester used at 3XP, offered for the first time. An accurate, precision instrument that every radio fan should own.  
**\$45** NET

## The New GAROD PYREX V. T. SOCKET

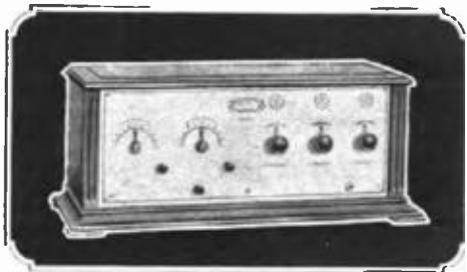
A wonderful socket made by a nationally known maker of fine radio apparatus. Limited number \$1.50 on hand. They're hard to get!

Before building your new set—regardless of the circuit—get our price FIRST! We will show for you—get you what you want without delay. "Radio in the Home" stands sponsor for us.

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Performance Proves This Five-Tube

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To Equal Any Set Made Anywhere  
Price \$120



The Super Clear-O-Dyne in a console cabinet. \$120.00

IN THE hands of actual users—many of them inexperienced—this set has won its place of equality with the finest five-tube sets ever made. It is equal in selectivity, in clarity and in sweetness and tone.

Your eyes will tell that in appearance it is distinctive and beautiful, and that it is well and carefully made by real craftsmen. It is an ornament—in any surroundings. You may pay more for a radio set—but you can't get more genuine satisfaction.

Write for literature and the name of your dealer. Jobbers and Dealers: A test sample will tell our story to you. Give your customers the biggest value.

Clear-O-Dyne Model 70...\$75.00	Clear-O-Dyne Model 80...\$100.00
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Console...\$120.00	Other sets from \$60.00 up.



THE CLEAR-TONE RADIO COMPANY, CINCINNATI, OHIO

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This is your opportunity to make some extra money. RADIO IN THE HOME will pay a substantial commission to a few more representatives.

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Such features as the PICTURE DIAGRAMS are extremely popular, as they take the mystery out of all hook-ups. To many fans, these diagrams are worth the entire subscription price.

Our representatives assume no obligations, financial or otherwise. You can devote as much or as little time as you prefer. You will find it to your advantage, however, to give the maximum amount of your spare time to this work, as you will be well paid for your efforts.

No investment is required. Send us the names of two persons who are acquainted with you, and fill out the form below. We will send you sample copies and all necessary supplies.

The radio season is in full swing and hundreds of subscriptions are to be had for the asking. So get busy and cash in on this opportunity by writing to us today.

Circulation Department

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608 Chestnut Street

Philadelphia, Pa.

Radio in the Home, Circulation Dept., 608 Chestnut Street, Philadelphia, Pa.

Please send me full particulars of your spare time plan to accepted representatives of RADIO IN THE HOME.

Name .....

Address .....

City..... State.....

Names, addresses and occupations of two references are on sheet attached.

of the cold weather. Wouldn't you be interested? Well I guess!

The market reports are of real interest to many people. KDKA asked last winter whether the listeners wanted the Baltimore markets continued in the report. Seemingly the response was not great enough so the report was dropped. But immediately protests poured in in such volume that the Baltimore market was again included.

I have stood in the lobby of a southern hotel and seen the cattle and grain men waiting, watch in hand, for the KDKA evening market report. Many of the people of the central and western states winter in the south and they are glad of the opportunity to keep in touch with the market from day to day instead of having to wait for the home paper.

So the next time you pick up a market report remember before you slam down the phones that good receivers won't stand banging and that somewhere some one is waiting watch in hand for the very thing that you are passing up.

### Now's the Time to Overhaul the Set

(Continued From Page 13)

spring contacts of the socket. These require attention more frequently than other contacts, too, since they are more exposed and are handled more often. Contact is made in different ways according to the construction of the socket. For instance, in Fig. 3 are shown two common forms, one in which contact is made on the tips of the tube prongs, while with the other, the contact springs grip the sides of the prongs. With the socket shown at the left, the springs should be bent upward enough to press tightly against the ends of the tube prongs. The contact surfaces of the springs should be sanded until they are bright and likewise the tips of the tube prongs.

With the other style of socket, the sides of the prongs should be sanded after the manner shown in Fig. 4 for the honeycomb coil. Moreover, any bent spring, as in Fig. 3, should be put in place again so that the "grip" is snug.

If you have a honeycomb outfit, remove the coils and clean the plug joints on both coil and its mounting. A narrow piece of sandpaper held between the thumb and forefinger cleans the extending prong very easily. The blade of a pocket knife is useful in bending apart the sections of the split plug for tighter contact in the receptacle. These latter can be cleaned with a piece of sandpaper wrapped around a match or a nail.

Any loose joint in the grid circuit is very provocative of disturbances in the phones and of lost signal energy. Hence, remove the grid leak and clean its metal ends. Also bend the springs of the grid leak mounting nearer together and clean the contact portions of these as well. If the plug-in type of grid condenser is used, remove and clean this also.

The phone jack is one of the most important items in the set from the standpoint of contacts and leakage. As a rule, the contacts don't require attention, although a light filing with a nail file will clean up the points well enough. Move the file two or three times, keeping it perfectly horizontal. The upper and lower contacts will be cleaned at the same time and the springs themselves exert sufficient pressure on both sides of the file.

However, the usual point of trouble lies around the soldering lugs and the little pile of "graham-cracker" insulating strips which keep the springs apart. Dirt and soldering flux are prone to collect at this end. A match wrapped with a clean cloth dipped in gasoline or alcohol is of service here.



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Type A, 5 volt, .25 ampere  
Read the guarantee furnished with every Atlas Tube:

"This Atlas Tube has been individually instrument tested and is guaranteed to give entire satisfaction. If unsatisfactory for any reason whatever, it may be returned within a period of thirty days to the manufacturer or to the dealer from whom it was bought, provided the filament has not been burned out.

Dealers are authorized by the manufacturer to make replacement or refund in such cases whenever may be desired by the customer.

Atlas Instrument Tested Tubes are guaranteed to function efficiently in Reflex, Neutrodyne, Superheterodyne, Radio Frequency or any of the circuits which require highest efficiency in tubes."

At best dealers or direct from us. Mail or \$3.00  
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SPECIAL OFFER—At no extra charge, we will furnish selected, instrument-tested, matched tubes in sets as follows:

Reflex Set—3 Tubes	.....\$9.00
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They will get the most out of your Radio Set.

DEALERS and JUNKIES—There is satisfaction as well as profit in handling ATLAS TUBES. The first tubes to be sold on merchandising principles affording full protection and satisfaction to your customers.

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### SAFE-GUARD INSULATION

the best enamel obtainable for stiffening all forms of low-loss coils, holding coil windings in place, and moisture-proofing material such as fiber, paper, wood, fabric, etc. Used in place of Spaghetti. Put up in transparent and red and green semi-transparent colors.

At Station 2XP, two bare wires were dipped in Safe-Guard, it was allowed to dry, the wires were then twisted together and tested across a "megger." Absolutely no leakage showed under a five-million ohm test.

Price 50c and \$1 Cans

At your dealers or sent direct Postpaid

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EKKO  
Broadcasting Station  
Stamp Album?**

Here's what every radio fan has wanted—a convenient, permanent and authentic means of recording all stations heard over your set. The Ekko Album contains spaces for a stamp from each of more than 650 stations. These stamps are verified and prove your reception of the station.

Proof of Reception cards are furnished with the album. Send the card to the station, together with ten cents, to cover cost of verification, give facts which prove you have heard their broadcasting. In return they send you their verified stamp as evidence of actual reception. The stamps are beautifully engraved in different colors, an individual stamp for every station showing the call letters.

The album is 9 1/2 x 11 inches, handsomely bound in a two color cover. It contains 84 pages, with spaces for stamps of all recognized stations arranged alphabetically by state and call letters. Also an alphabetical list of the official names and other interesting features of stations, as well as a convenient log.

See your dealer today, get a copy of the Ekko Album and start a collection of these stamps. You will find this a new and fascinating method of verifying the stations you hear. If your dealer cannot supply you, post direct on receipt of price. Money back if not satisfied.

Price \$1.75

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RADIO LIGHTNING  
ARRESTERS**

MUCH of the success in radio reception depends on your antenna. Look yours over now. Fix it for the winter and be sure to install a Keystone Arrestor. No set is perfectly protected without a Keystone. Ask your dealer for the new type genuine Bakelite Keystone Arrestor.



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are listed in our Catalog of 97% guaranteed Mailing Lists. It also contains vital suggestions how to advertise and sell profitably by mail. Counts and prices given on 6000 different national lists, covering all classes: for instance, Farmers, Noodle Mfrs., Hardware Dns., Zinc Mines, etc. This valuable Reference Book free. Write for it.

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**GRIMES  
and His Famous  
INVERSE-DUPLEX  
SYSTEM**

are found exclusively in Radio in the Home. This system, applied to any standard circuit, reduces the number of tubes and consequent drain on batteries, increases efficiency and simplifies tuning.

David Grimes is one of our Associate Editors, and writes for no other publication.

Or a small stiff brush—an old tooth-brush will do—dipped in the cleaning liquid, may be employed to get in between the springs and rub out old flux and dirt. Too much importance cannot be attached to this part of the radio housecleaning and it should be done with painstaking care until the lugs and the insulating strips are "clean as a whistle."

It is also well to try inserting the phone plug in the jack to note whether contact is properly made. The curved ends which bear upon the sleeve and tip of the phone plug should be sanded lightly, as well as the plug itself. If the plug doesn't fit correctly, the fault may usually be remedied by adding an extra washer beneath the head of the "hex" nut appearing on the face of the panel. In case some of the jack's soldering lugs come too close to each other, they should be slightly sprung apart. This prevents the formation of a leakage "bridge" of dust from one to the other.

In Fig. 7 another valuable task is illustrated. A dust coating usually collects on the stator and rotor plates of the variable condensers, no matter how tight fitting the cabinet may be. Hence it is advisable to take a clean cloth supported on a thin piece of metal such as a long nail file and wipe between the plates carefully. This is a somewhat laborious undertaking, since sometimes the plates are rather hard to get at. It's worth while, though and shouldn't be neglected.

Flexible connecting wires of variocoupler rotors and tickler coils should be inspected for breaks and broken contacts. Likewise pig-tail connections of moving part and variable condensers. Variable condenser rotors should be examined for accuracy—for bent plates and dangerous nearness to the stator in their tuning.

Remaining troubles are ordinarily confined to tubes and "B" batteries. If you suspect a tube, insert your phones in the first stage and then interchange both amplifier tubes for a comparison of their sensitivities. If you believe your "B" batteries to be run down, but haven't a voltmeter to test them you may gain some idea of their current delivering power by connecting a 110-volt 25-watt lamp across each 45-volt unit in turn. It should light dimly in case the battery is in fair condition and should not decrease its brilliancy when it is left connected for five or ten seconds. Old "B" batteries usually develop noisiness, because of the chemical action which eats away the sides of the zinc cell containers and forms short circuits between cells.

Once you have experienced the pleasure of operating a set that is perfectly quiet in its adjustment, knows no scrapes and squeaks as you move the condenser a hair's breadth in either direction, gives forth no rattles should you happen to bump into the table and tunes with clean-cut precision all the time, you'll never regret the hour's labor you devoted toward rejuvenating your receiver.

**The Dawn of a New  
Day for the Blind**

(Continued From Page 49)

traces of a national association of listeners-in. The writer of this article ushered these traces in and began expanding them until today the American Radio Association stands forth as a power or rather a constructive force in the radio world.

It started with no money, no office—nothing. The writer paid all the bills, did all the work and carved out the paths upon which the Association was to travel. This is mentioned only to show what can be done when the right viewpoints direct a project.

The Association began to take form. Moral support came from all sections of the country and finally financial support began to come in. Today the

ARA has members in every State of the Union and the Association's activities are becoming big. It has been of immense service to radio fans and offered them many benefits. But the best of all it has launched a national campaign to put a radio set in every home where there is a blind person.

This is the fruit of a determination that had its inception when the writer realized the possibilities that radio held for the blind. The preliminaries of the campaign are now under way, and by the time this article appears in print it will probably have been launched in national form. An Honorary Committee is now being formed, and also an Executive Committee; the press of the country and the broadcasters are being informed of the forthcoming campaign and are agreeing to give it unstinted support.

But while the ARA sponsors this work, it is not alone in carrying it on. Realizing the immensity of the task and the facts that have been compiled in the work for the blind, the writer approached the American Foundation for the Blind and sought their co-operation in this movement, and their co-operation was forthcoming. This Foundation is a national organization, composed of or governing the activities of local associations engaged in the same line, and it is doing a splendid work indeed. Another organization of a somewhat different character is the Matilda Zeigler Magazine for the blind, a privately endowed institution which is also doing a noble work. They, too, have joined forces with the movement and are acquainting their readers with the campaign to be launched. This magazine is printed in raised alphabet and sent free to every blind person who desires to receive it.

As will be appreciated, a movement of this sort gathers momentum slowly. There is a world of preparation involved. The stage has to be set and the play rehearsed—at least in outline. Material for publicity has to be gathered and everything made ready for a successful campaign. But the work is progressing wonderfully and success for the campaign is well assured.

And the best of it all is that the blind have become greatly enthused over the prospects of receiving radio sets. There are approximately 80,000 blind persons in the United States, between 50,000 and 60,000 of whom cannot afford to purchase a radio set. They are scattered all over the country, constituting about one-tenth of one percent of our population. Indeed, there are approximately 4000 blind people in New York City alone. Many of these live in institutions, but the larger majority live with relatives and friends.

Taken as a whole they are a very industrious lot of folk, preferring to engage in some form of occupation. And happy! One of the strangest paradoxes of this life is that people who are obliged to go through life with concededly the greatest human handicap are good natured, ambitious and a shining example of fortitude, the like of which can be seen in no other phase of life. But as a class, if they can be termed a class, they send out one common plea—Give us a chance; all we want is an opportunity to take our place in the world.

For one, the American Radio Association is going to lend every effort to better the condition of the blind via radio. It is going to ask sighted people to aid the unsighted to the extent of providing them with a "pair of electrical ears." It has formed a division in its membership for the blind, the first member of which is our ex-policeman friend, Patrick O'Keefe. Thus it aims to keep contact with and invite active participation of the blind, and the ARA, the national association of listeners-in, is an organization in which they will have a representative voice.

**Ingenious**  
**The**  
**"SELF ADJUSTING"**  
**Rheostat**

**\$1.10**  
everywhere

Write for FREE Hook-ups

AMPERITE controls perfectly and automatically the current flow from battery to tube. No Rheostat knobs on panel to turn. No ammeter needed. No worry. One AMPERITE for each tube inside the set regulates current on thermo-electric principle. Simplifies wiring and operation. Facilitates tuning. Proven in use. Adopted by 50 set manufacturers. Be sure your set is equipped with AMPERITE.

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**AMPERITE**  
*"means right amperes"*

"Turn-It" greatly increases the volume, secures greater distance and reduces noises.

**TURN-IT**  
ADJUSTABLE  
**GRID LEAK**

Changes the range of resistance to suit the strength of reception.

ABSOLUTELY GUARANTEED



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**Every Kansas Farmstead Can Be a College Classroom**

(Continued from Page 44)

will be able to save both time and money by following instructions. We learn lots of things that we would never have found out otherwise. We learn to appreciate KSAC, which many of us never did before. Your 'Air Course' will help better the farm conditions, which in turn will help keep the younger generation on the farm, which is very important. It also brings the realization that the KSAC is a school for helping the farmer.

"A. H. Eberle, 'Madison, Kan.'"

"That this is the first college course ever given by radio does not alone prompt me to inclose the card to be enrolled for your courses. I want to take this privilege of congratulating you, and thanking you, for work that it would be impossible for me, as thousands of others, to take, if it were not for your unique idea.

"D. S. Himnan, 'Elgin, Neb.'"

"We certainly enjoy hearing your good advice on crops and livestock. We could hear you real plain last night on 'Seeding Alfalfa,' and also on 'Hog Feeding.' Your announcer is plain and we sure enjoy jokes he cuts in once in awhile. Now we think your lectures O. K., as we can't all attend the college.

"Keep a good thing going. 'Henry Sylvester and Family, 'Riley, Kan.'"

"It is no bother for me to have an audience every night. Several farmers have spoken ahead for dates when certain lectures are to be given that they are especially interested in.

"I hope that you will keep it up. It is just the thing I long have wanted, to get a little close touch with KSAC, as it is hard for me to get away from the farm and come to Manhattan for any great length of time. And this brings KSAC to the farm.

"J. L. Mellor, 'Waverly, Kan.'"

"Your program comes in just fine. Couldn't be any better. We get the whole program every evening and appreciate it very much. They are a great help to us. But we are sorry to say, we have not the time to enroll and stand an examination, as we are very busy farmers. These lectures are also a great help in teaching us the proper use of the English language.

"Mr. and Mrs. Fred Bruck, 'Bala, Kan.'"

"Heard your program last evening, which came in fine here, and the talk in regard to building up soil fertility by growing legumes was instructive to people of Iowa and other States of the Middle West as well as to the people of Kansas.

"Thanks for the entertainment and instruction sent out by you. Let the good work go on.

"A. G. Obrecht, 'Havelock, Iowa.'"

"I am receiving your radio lectures regularly. Luck to you, for it sure puts KSAC on the map. You can't realize how much good it does a fellow to hear those familiar songs by familiar voices.

"Ansel D. Miller, 'Wilson, Okla.'"

"I would like to say that I believe you are doing a great thing for the Kansas farmer or any one else who might hear you. I actually believe that if the farmer would follow the results of your experiments an enormous amount of the unsuccessful farming and stock feeding would be eliminated. And through broadcasting more farmers will receive it than by any other method.

"Howard Strouts, 'Wilsey, Kan.'"

**Our Most Successful Hook-Up**

(Continued From Page 8)

One Fada neutroformer. Two Fada neutrons. A bunch of binding posts that I picked up, and not having the proper fixed condensers I used:

- Two .006.
- One .0025.
- One .005.
- One .001 Dubilier.

Now comes the knock-out. I did not have a loop antenna and could not find enough wire for a coil, so I took an old Fada neutroformer coil and two broom sticks and an old Victrola record and proceeded to make a loop. When I had wound the wire on the frame, which is fifteen inches square, I had nine turns, and I tapped each one by using an outside antenna in connection. I have heard everything from Buffalo, N. Y., to Oakland, Calif., and that is no joke. In fact, my friends are so well pleased with it that I have contracted to build two of them, one each, and have already written to Mr. Clarke and asked him to buy the complete parts as specified by you so that they will be satisfied.

I have operated everything from a crystal set to a nine-tube super-heterodyne, but I have never used a receiver—factory made or otherwise—that could give better results than this one. I thank you for the wonderful diagrams which you published.

Yours very truly,  
**PAUL L. CARRIGER.**

Box 216, Smackover, Ark.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. Required by the Act of Congress of August 24, 1912.

**RADIO IN THE HOME**

Published monthly at Philadelphia, Penna. FOR OCTOBER 1, 1924.

State of Pennsylvania ) ss: County of Philadelphia )

Before me, a Notary Public in and for the State and County aforesaid, personally appeared George W. Kraft, who having been duly sworn according to law, deposes and says that he is the Secretary-Treasurer of the RADIO IN THE HOME and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc. of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are: Publisher—Henry M. Neely Publishing Company, 608 Chestnut Street, Philadelphia, Pa. Editor—Henry M. Neely, Delanco, N. J. Managing Editor—None. Business Manager—W. L. Dudley, Plainfield.

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding one per cent or more of the total amount of stock.) Henry M. Neely, Delanco, N. J.; Mrs. Norman Supplee, 1022 Spruce Street, Philadelphia, Pa.; John Martin, Wynona, Pa.; George W. Kraft, 5008 Larchwood Avenue, Philadelphia; Norman Neely, Delanco, N. J.

3. That the known bondholders, mortgagees and other security holders or holding one per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which such stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of bona-fide owners; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above, is: (This information is required from daily publications only.) HENRY M. NEELY PUBLISHING COMPANY.

G. W. KRAFT, Secretary-Treasurer. Sworn to and subscribed before me this 18th day of September, 1924.

(Real) My commission expires January 7th, 1927.

NOTE: This statement must be made in duplicate and both copies delivered by the publisher to the postmaster who shall send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the file of the postoffice. The publisher must publish a copy of this statement in the second issue printed after its filing.

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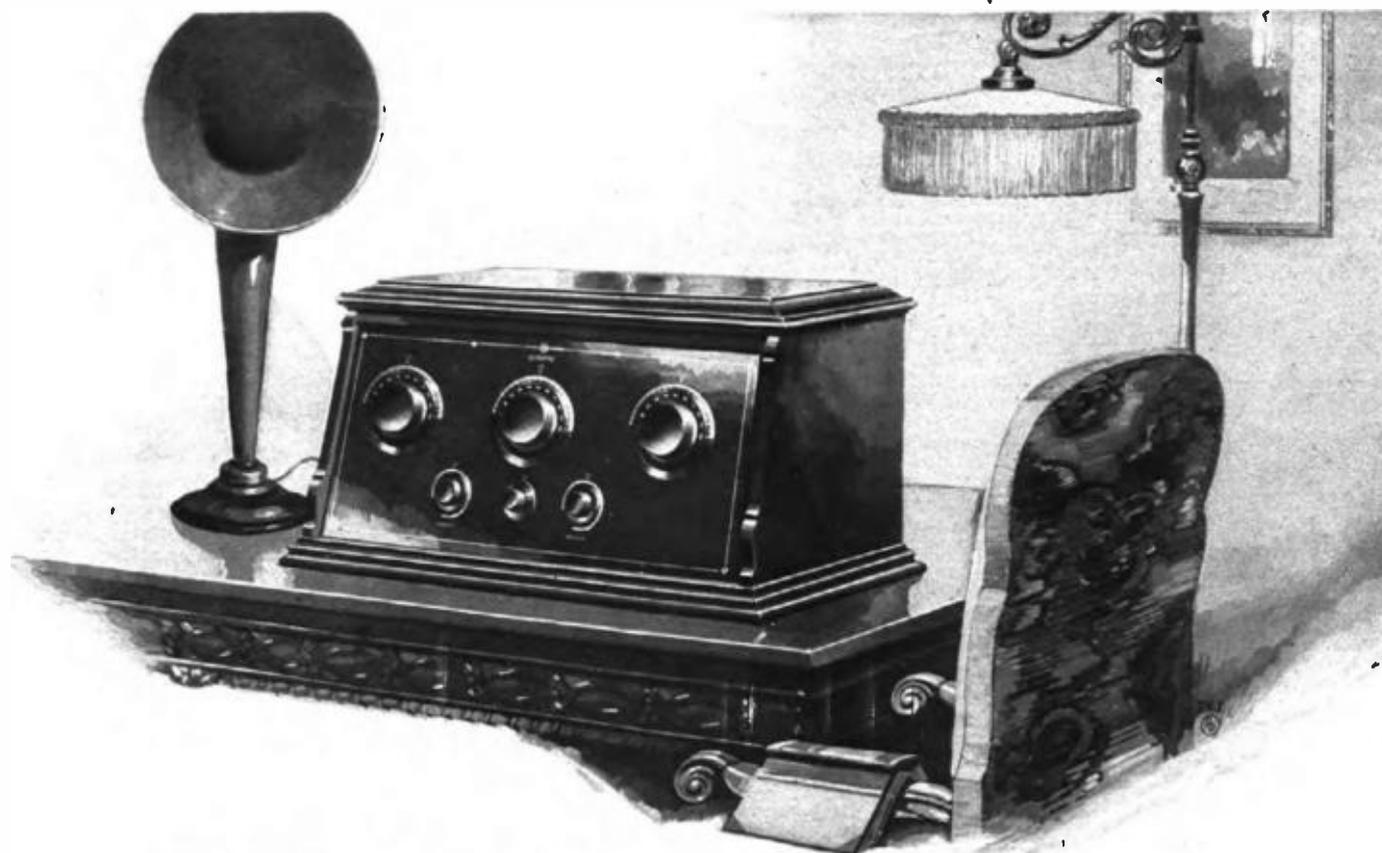
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