

The CROSLBY

# Broadcaster

WLW



WSAI

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NO. 15.



**MORE**  
*"Big news in Radio"*



Published by the  
**CROSLY RADIO CORPORATION**  
Manufacturers of Radio Apparatus  
Colerain & Sassafras Streets  
CINCINNATI  
Telephone : Kirby 3200

Editor: Edward F. Mottern  
Assistant Editor : Francis G. Wilson



Crosley manufactures radio sets for radio amateur, experimental, and broadcast reception use, under patents of the Radio Corporation of America and Associated Companies, The Hazeltine Corporation, and the Latour Corporation.

All prices quoted in the Broadcaster are Eastern prices. Western prices are slightly higher.



This is your paper. Help make it interesting by sending in contributions. Material sent in is most welcome. Comments of every description will be appreciated. Let's all pull together.

## New Crosley Models. Crosley 30 and Crosley 40

POWEL CROSLY, JR., IS SOMETHING of a magician. Where most of us are content to sit around with smiles of satisfaction over what to our minds is the best line of radio at the most moderate price, Powel Crosley, Jr., is never satisfied. No sooner has one remarkable addition been made to the line when, presto! there is yet another from a seemingly inexhaustible supply.

First we had the "Big News"; then radio furniture in period or any style desirable. And now Powel Crosley, Jr., produces the Crosley 40 and the Crosley 30. The Crosley 40 is an 8 tube A. C. receiving unit equipped with a burl walnut panel similar to the panel on the 40-S. The Crosley 30 is a 7 tube receiving unit similarly equipped with a burl walnut panel. Both of these chassis have been produced to meet the demand for separate chassis for installation in cabinets of the customer's choice. They round out the new line with a bang! They are made to sell at a most reasonable price—the Crosley 30 only \$50; the Crosley 40 at \$65. The Dynacone (console type \$13.00) is used with this chassis.



THE MELON IS RIPENING, GENTLEMEN. It is almost ready for the cutting. About a month ago, Powel Crosley, Jr., presented the radio trade with a most complete line of radio receiving instruments conceivable. Right at that time, you had a line in your hands that should have reduced competition and sales resistance to a minimum. But Powel Crosley, Jr., was not satisfied with perfecting the "Big News in Radio", he was aiming for even more complete dealer satisfaction by making a startling addition to the Crosley merchandising plan.

By reason of the fact that production of more than the restricted list of cabinet models was impractical, Powel Crosley, Jr., decided that you should be given an unlimited choice of cabinet models for presentation to your prospective customers. On June 24th he called together seven of the leading furniture manufacturers of the country in Cincinnati. There a plan was formulated that would give you the widest possible choice of exclusive designs in cabinets for the new Crosley Unitrad—the screen grid receiving unit that is the sensation of the industry.

The seven cabinet manufacturers were selected after a long period of consideration and elimination. They represent the finest group of furniture craftsmen in the country—and what is more they will make radio cabinets almost exclusively for Crosley.

On July 16 and 17, with Powel Crosley, Jr., acting as neutral mediator, the distributors of the Crosley organization, and the representatives of the seven furniture manufacturing companies were called together at the Hotel Gibson in Cincinnati. The cabinets shown at the convention were of exclusive and original design. Your distributor has made his selections. You buy these cabinets at the lowest possible cost, and with a minimum of handling—directly through your Crosley distributor from the largest furniture manufacturers in the world.

Does this plan appeal to you? Isn't this the most remarkable rounding out of a competition smashing radio line that was ever presented to the trade. Today your customer has the selection from a remarkable line of receivers and a beautiful line of cabinets. Tomorrow is up to you. The melon, gentlemen, ripens as we write.

## Packet Race Pick-Up From Mid River

WLW Shows How Big Job Can Be  
Handled Satisfactorily

THE GREAT RACE OF THE BETSY ANN and the Tom Greene up the Ohio River for the coveted silver tipped antlers was run before the largest audience that ever enjoyed a river classic. All this was possible through the skill and determination of WLW's technical supervisor, J. A. Chambers. Other attempts have been made to broadcast events from air-planes, from boats and other moving points of vantage, necessitating dependence upon the vicissitudes of short wave transmission. Most of them have been decidedly unsatisfactory, rather an indication of future possibility.

In the words of the radio editor of the Cincinnati Post:

"The First of the obstacles was overcome easily, for the Federal Radio Commission, realizing the importance of the experiment, granted WLW a license to broadcast on the short wave of 99 meters.

"As soon as this grant was received Chambers built a short wave transmitter and a short wave receiving set, the former to be installed in the observation deck of the Tom Greene, the latter to be at Coney Island.

"After a short wave description was received at Coney, it was to be sent by telephone wires to the WLW transmitter at Mason, whence it was to be broadcast on WLW's regular frequency for a waiting world.

"Billings felt that the broadcast would have more chance of being a success if it came from one point only—the boat—and so decided against pickups from the Cincinnati wharf, the starting line and from New Richmond, the finish line.

"Robert Brown was chosen to officiate at the microphone. He is one of WLW's most popular announcers and has had varied experience in covering sports events. He broadcast from an airplane back in 1925 through a Buffalo station."

This broadcast proved so successful that the Cincinnati Post issued a few minutes after the conclusion of the race a special edition which contained the running account of the race as written in the newspaper office and taken verbatim from Robert Brown's rebroadcast description coming through the loud speaker. Much interest centers about this successful use of short waves because of the possibility which it opens up in bringing to the radio audience direct-from-the-scene eye witness description of many events the nature of which render impossible the ordinary use of land wire connection. While a special broadcast license is required from the Federal Radio Commission for each such event, it is rumored around WLW studios that further unusual programs will be inaugurated with the aid of the low wave transmitter.

KIERULFF & RAVENSCROFT, Crosley distributor in Los Angeles, is holding classes in salesmanship, and will hold classes in window trimming. This is real, practical education. This is a splendid method of converting old fashioned "storekeeping" into the semi-scientific class of merchandising. It is true that the selling ability of a window or of a single advertisement is difficult to estimate accurately; but it is known that certain fundamental principles must be adhered to to get maximum results. It is not necessary, now, for the intelligent man to gain practical knowledge in the school of trial and error. This method is often too costly. The world of merchandising has established by such costly methods of trial and error coupled with intense study certain principles that are valuable to know. Kierulff & Ravenscroft are putting these principles to work for their dealers and incidentally for themselves. They are to be commended for their foresight in educating dealers to the tremendous value of good windows and intelligent salesmanship. We might suggest classes in radio, classes in newspaper advertising, classes in other forms of advertising.

## Keeping Fit

MODERN MAN NEEDS BODILY STIMULATION to counteract the effects of actionless, indoor life. The Crosley Autogym is the modern, scientific way of keeping fit. It is the answer of science to the problem aroused by the need of concentrated stimulating exercise.

Electric vibrator machines have been on the market. They were good, they performed their proper functions well, but they cost too much. Powel Crosley, Jr., studied the vibrator market carefully. He saw what was wrong, and he has remedied it. He has built a strong sturdy machine, endorsed by an eminent medical specialist, that sells for much lower cost than any other machine on the market.

Due to the fact that this specialist is eminent in the medical profession, his opinions are worthwhile. Because he is a proponent of medical ethics he will not permit his name to be employed in testimonial advertising. He investigated the claims made by Powel Crosley, Jr., for the Autogym. Purely in the interests of science, he tested the appliance and discovered that many beneficial results may be obtained by systematic daily use of the Autogym. He contends that digestion of food and elimination of waste are improved; muscles are made firm; nerves rested; circulation of the blood stimulated; and flabbiness overcome by removing fat from any part of the body at will! These results are at once recognized as the results also to be obtained from regular outdoor physical exercise.

Here is a machine that the whole family may use. Here is a machine that should bring health with regular fifteen-minute-daily use. The Crosley Autogym is a feature for your trade that should sell itself—and it sells for the same price of a good suit of clothes. With proper care, this handsome, sturdy machine should last a lifetime.

Advertising material relative to the Crosley Autogym will be available in the near future.

## Powel Crosley, Jr., Heads Radio Merchants' Outing



A high-light in the outing of the Radio Merchants Association of Cincinnati at Coney Island was the presenting of the first prize and congratulation of the winner by Powel Crosley, Jr., Chairman of the outing. The winner is Mary Belle Smith of Southgate, Kentucky.

THIRTY THOUSAND PEOPLE ATTENDED the annual outing of the Radio Merchants' Guild of Cincinnati at Coney Island, popular playground of the Queen City on July 1st. Powel Crosley, Jr., was chairman of the outing and it was under his able leadership that the outing was the most successful ever held by the Cincinnati radio organization.

A feature of the day was the presentation of over \$5000 worth of prizes to the three leaders in a bathing beauty contest which was won by fifteen-year-old Mary Belle Smith of Southgate, Kentucky. Powel Crosley, Jr., presented the prizes and congratulated the winners.

The picnic opened with a baseball game that ended after a few innings when the umpire, attired in armor and astride a horse, decided that he had suffered enough.

The outing ended with a banquet in the Colonial Dining Hall attended by 350 members of the radio trade in Cincinnati.

In sending in photographs and other material to The Broadcaster for publication, it will be appreciated if more information is given concerning them. It is much to the advantage of the contributor if the features of the material is stressed. For instance, if a photograph of a window is sent, describe the background, giving colors and materials used. Tell us of the results, if possible, in actual requests from prospects, for information. All material of interest published in The Broadcaster is valuable to the organization.

## TALKS TO THE TRADE

Additional big news in radio was announced July 16 and 17 at a convention of distributors and furniture manufacturers in Cincinnati. A magnificent line of cabinets was displayed by the following seven authorized cabinet manufacturers, each manufacturer showing from three to eight models. They are:

Berkey & Gay, Grand Rapids, Michigan; Doernbecher Manufacturing Company, Portland, Oregon; Memphis Furniture Company, Memphis, Tennessee; Rockford Furniture Company, Rockford, Illinois; Showers Brothers Company, Bloomington, Indiana; Sligh Furniture Company, Grand Rapids, Michigan; Thomasville Chair Company, Thomasville, North Carolina.

Some of these cabinets were of the conventional type, outstanding only because of their design and beautiful finish. Others were period designs, Italian, Spanish, Tudor, Gothic, and so forth. A comprehensive line of these cabinets was selected by each distributor for sale in his territory. Samples will be available in the near future for display to Crosley dealers.

The 40-S chassis slides into the cabinet in an instant. The new Dynacoil speaker is suspended from a hook provided in the cabinet and can be attached or detached in a few seconds.

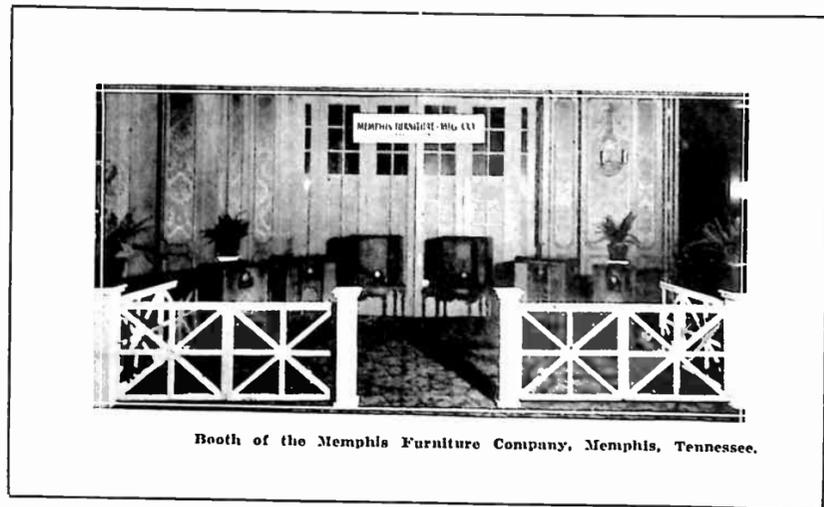
With this line of cabinets available to Crosley dealers the position of the Crosley line is greatly strengthened in the field, making it, we believe, the outstanding line and emphasizing what is on the tip of the tongue of every Crosley dealer that this is indeed a Crosley year.

Powel Crosley Jr.

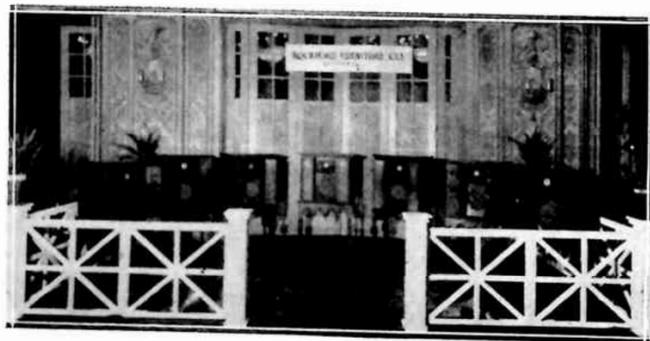
# Screen Grid radio plus... in any cabinet you choose!



Distributors, furniture manufacturers and Crosley representatives at the Hotel Gibson in Cincinnati, July 16 and 17. The arrow points to Powel Crosley, Jr., in center.



Booth of the Memphis Furniture Company, Memphis, Tennessee.



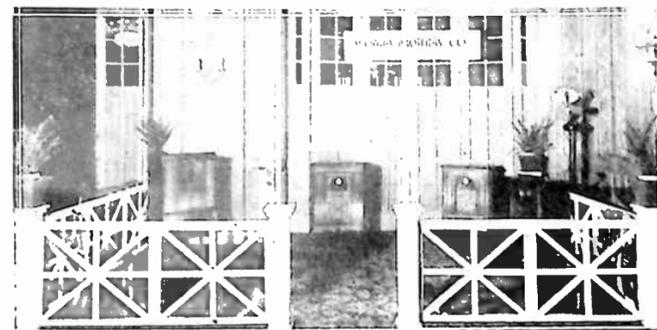
Booth of Rockford Furniture Company, Rockford, Illinois

CONSOLES TO HARMONIZE WITH ANY INTERIOR! CONsoles equipped with the Crosley Unitrad, screen grid receiving unit! Is your taste for Louis XVI or Chippendale? Does the antique artistry of Spain or Italy appeal to your aesthetic sense? If so, The Crosley Radio Corporation is ready to supply your needs.

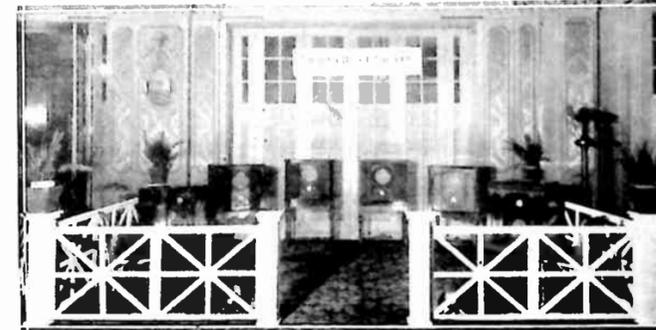
On July 16 and 17, the Crosley distributors and seven of the foremost furniture manufacturers in the country convened at the Hotel Gibson. The meeting was presided over by Powel Crosley, Jr., who acted in a neutral capacity. Each one of the manufacturers save the Doernbecher Manufacturing Company of Portland, Oregon, displayed their designs to the interested distributors. After careful deliberation, the distributors selected those cabinet designs which they considered most suitable for their respective territories.

The seven manufacturers who will co-operate with Crosley to produce fine radio cabinets are Berkey & Gay, Grand Rapids, Mich.;

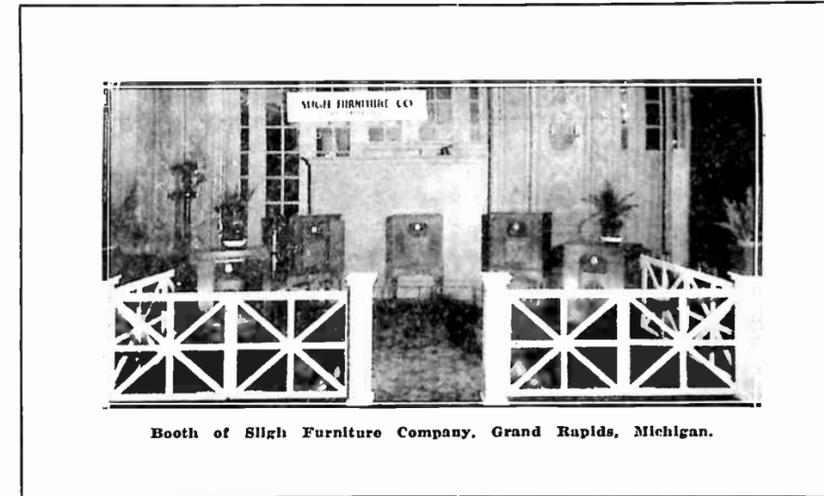
# Screen Grid radio plus... in any cabinet you choose!



Booth of Showers Brothers Company, Bloomington, Indiana.



Booth of Thomasville Chair Company, Thomasville, North Carolina.



Booth of Sligh Furniture Company, Grand Rapids, Michigan.

Doernbecher Manufacturing Company, Portland, Ore.; Rockford Furniture Company, Rockford, Ill.; Showers Brothers Company, Bloomington, Ind.; Sligh Furniture Company, Grand Rapids, Mich.; Thomasville Chair Company, Thomasville, N. C., and the Memphis Furniture Company, Memphis, Tenn.

All of the cabinets designed by these seven manufacturers are original and exclusive with Crosley. They are specially equipped to accommodate the Crosley Unitrad. Slides inside the cabinet permit the Unitrad to be slipped in in a second's time; a hook permits suspension of the Dynacoll used with the Unitrad within the cabinet. Connecting speaker and receiving unit is the work of a few seconds.

The new Crosley plan was received with great enthusiasm by the distributors. It was the general feeling at the convention that nothing more could be desired to make the Crosley line the most complete in the trade.



Booth of Berkey & Gay, Grand Rapids, Michigan.

# Crosley in the RMA of the West



ON JUNE 11, JUNE 13, INCLUSIVE, THE Western Music Trades held their annual convention at Salt Lake City, Utah. This meeting is considered the Radio Manufacturers Association of the West and is attended by dealers from every city and hamlet in the western country.

The day before the meeting opened, Crosley was off to a flying start when Western Supply Company, Crosley distributor in Salt Lake City held a dealer meeting at which the Big News in Radio was disclosed. The Utah hotel was the scene of the post-showing of the new line.

The meeting was addressed by P. W. Blalkowsky, Crosley representative, who discussed the new line from every angle. W. B. Puffer, Amrad representative, spoke on the new Bel Canto series. These addresses were followed by a luncheon and an elaborate program. Don Daynes, of Daynes-Beebe Music Company of Salt Lake City acted as toastmaster and introduced Mayor John F. Bowman who presented the assembled Crosley dealers with the keys of Salt Lake City. He delivered a forceful address on the great service rendered by radio

dealers in equipping the public with receivers. Mayor Bowman was followed by Dr. Adam S. Bennion, the eminent educator, who discussed radio and its influence on education. Lester D. Freed of Commercial Credit Companies talked on the operations of his company and their method of handling radio paper. N. G. Hall, Vice President of Columbia Trust Company, advised the dealers on collections. The nuances of advertising were discussed by W. V. Wegand of the Salt Lake Telegram, who approached his subject interestingly and convincingly.

## D. W. May Icyball Window

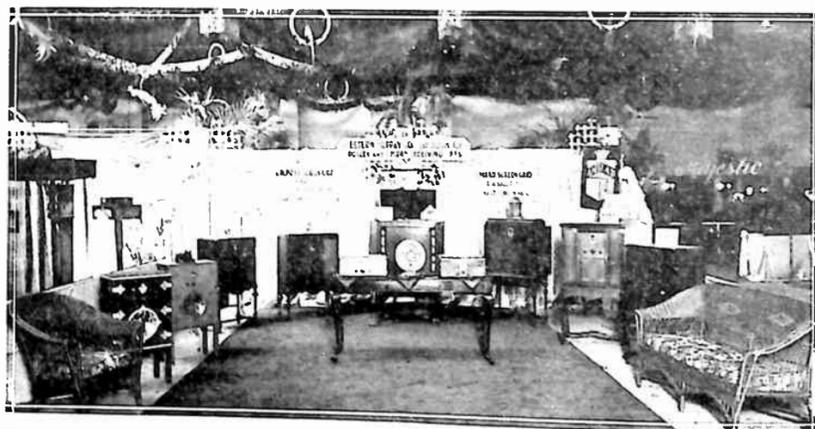


THIS ATTRACTIVE AND COOL LOOKING window was featured by D. W. May for its dealer meeting. The window has an all-summer appeal and is decorated with blue and white Dennison crepe paper. This window is a study in simplicity. Perhaps a price indication may have improved the final appearance; its simplicity, however, has much to commend it.

Don't expect a buyer to understand in ten minutes what it took you ten months to learn.

Nothing hurts a salesman like a reputation for "stretching" the facts.

## Crosley Booth at Western R. M. A.



THE CROSELY BOOTH AT THE SALT Lake City Radio Show, the RMA of the West. The new line was displayed to fullest advantage and was received with notable enthusiasm

by the trade. Attractive settings brought out the new line to fullest advantage and excited interested comment from the enthusiastic groups around the display.

## New Wetmore-Savage Branch

Wetmore-Savage A. E. Company have opened a branch at 53 Exchange Street, Portland, Maine, where a complete display of all Crosley merchandise will be on hand.

If you are in doubt as to whether to say a thing or not—Don't.

## New B. H. Spinney Company Branch

In line with Crosley expansion, B. H. Spinney Company, Crosley distributor, has enlarged its spheres of influence by opening a branch office at 930 Broad Street, Bridgeport, Conn.

Tomorrow may never come—what are you going to sell today?

# Rochester Electrical Supply Company Outing

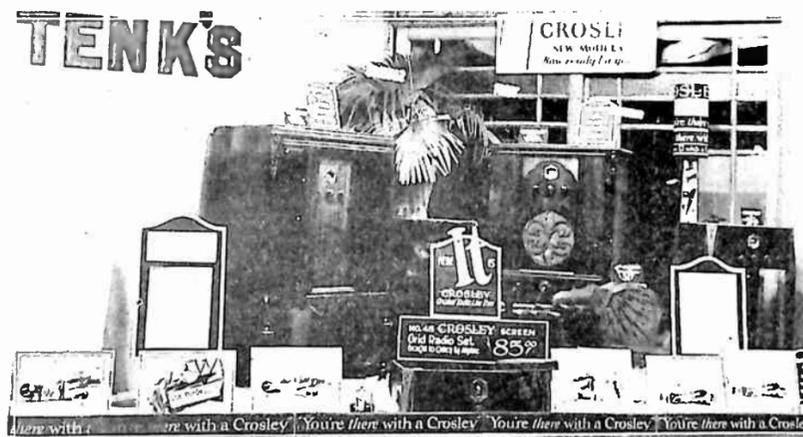


ONE HEARS A GREAT DEAL THESE days about "warming up" the prospect. Rochester Electrical Supply Co., Crosley distributor in Rochester, N. Y., believes in cooling them off. At least that was the purpose of the outing given for Rochester Dealers at Sea Breeze Park. The

piece de resistance of the day's entertainment was swimming in a large natatorium—an outdoor salt water pool equipped with every conceivable kind of pool equipment. Three large automobiles decorated with Crosley insignia conveyed the party to the Rochester resort and returned them to the Community Theater—a

building chartered for the day. Here a six-course dinner was served the dealers; the new line was introduced and talks were given by Jack Dalton, Crosley representative, and B. E. Finucane, President and General Manager of Rochester Electrical Supply.

## Tenk Hardware Window Draws Attention



A GREAT DEAL OF GOOD PUBLICITY was the result of the Tenk Hardware Big News window featuring the Crosley 41-S receiver and photographs of the airplane sent to Cincinnati to bring back the "Ace in the

Hole." The important result of the window display was the gratifying number of inquiries relative to the 41-S receiver. Many people felt that it must be something good if Tenk was interested enough to send an airplane to get it.

## Crosley Player is Injured While Presenting Drama

SO REALISTIC WAS THE PRESENTATION by the Crosley Players at WLW of "The Chink and the Child" from "Limehouse Nights" that the radio drama ended in a real tragedy. The continuity called for the breaking of a window. Howard Besuden, director of the group, who was playing the part of Chuck, the trainer, smashed a bottle for the sound of breaking glass. He slashed his hand badly in the act. Undaunted by the profuse flow of blood, he went on with his part while another member of the cast wrapped the hand up with a handkerchief.

## New Dealer Stores in Harper-Meggee Territory

DURING THE FIRST WEEK OF JUNE two new radio stores handling Crosley merchandise were opened in the territory of Harper-Meggee, Inc. G. R. Gregg now has one of the finest radio stores in Seattle, "The Fox Radio Studio."

Jim Forrestal, a veteran in Harper-Meggee service, opened a branch shop in Seattle. Forrestal carries Crosley and Amrad lines exclusively.

A complaining salesman excites more contempt than he does pity.

## Harper-Meggee Publication

HARPER-MEGGEE, INC., CROSELY DISTRIBUTOR in Seattle, Washington, publish a two page newspaper "Harper-Meggee Dispatch" giving the high lights of events in their territory. In their extra edition of June 26 they give information on the new line, dealer notes, stories on their "open house" and other information of interest to their organization.

## Orr Iron Company Window



ORR IRON COMPANY, CROSELY DISTRIBUTOR in Evansville, Indiana, recently ran a very interesting window in the most central part of Evansville—the window of the Courier-Journal, leading newspaper in the Hoosier city. The window was decorated in excellent taste and the new Crosley line was displayed prominently. Orr Iron Company reports considerable success with this form of advertising. Their intention is for dealers to tie in with this advertising with the excellent fundamental idea that repetition of a worthwhile message is a basis of good advertising.

A salesman who complains about his job only advertises his failure.

# These New Crosley Ads Are Ready For You!

**Never before so much for the money!**



**CROSLEY 31**

Here is a radio receiver with the new Crosley 31. It has the reputation of modern radio with the touch of every antique.

Handsome, substantial, smooth, modern case with contrasting white metal trim. Dimensions 10 1/2" x 14 1/2" x 10 1/2". Net weight 10 lbs. Full set with 2 tubes, 1 set of speakers, 1 set of headphones, 1 set of earphones, 1 set of headphones, 1 set of earphones, 1 set of headphones, 1 set of earphones.

Crosley 31 has 2 tubes including rectifier, such dual illuminated control, special wide dynamic range, light work operation. An easy set for installation. The new play of power to bring stations in clearly!

Arrange for a five day free trial in your home. Ship to today.

You're there with a  
**CROSLEY**  
Dealer's Name

**A New Standard of Beauty at an Amazing Low Price!**



**Crosley 32**

**EVERYTHING you want in a radio receiver is here. From speaker over the top to the base.**

Two-tone walnut veneer case, 4 1/2" x 11 1/2" x 11 1/2". Net weight 10 lbs. Full set with 2 tubes, 1 set of speakers, 1 set of headphones, 1 set of earphones, 1 set of headphones, 1 set of earphones.

The most E. F. Johnson sensitive type dynamic speaker is incorporated in this set. It is a feature of a radio receiver at this price.

You're there with a  
**CROSLEY**

**YEARS AHEAD**

...in beauty  
...in performance  
...in new low price



**Crosley 32**

...in beauty  
...in performance  
...in new low price

You're there with a  
**CROSLEY**

Use this proof for your CROSLEY Ad

**MODERN RADIO at the lowest cost!**



**Crosley 32**

DEALER'S NAME

GET YOUR SHARE OF LOCAL BUSINESS with these unusual ads. This new set of newspaper advertisements has been prepared for your exclusive use by the advertising department of The Crosley Radio Corporation. They feature the popular Crosley 31 and 32 models. Only the newest of type faces have been employed to make these ads stand out from the page. The type matter is educational and should appeal to your public. These ads are now available in mats and may be secured through your distributor.

**The NEW CROSLEY RADIOS set new radio standards**

Ready for immediate delivery  
AC RECTIFIER  
**\$55.00**

**NEW!**

Dealers.



# CROSLEY DEALERS



## "Silent Cal" Talks Fast For Crosley

**COMING TO REDLANDS**  
TOMORROW—TUESDAY—JUNE 18

**'SILENT CAL'**  
THE MECHANICAL MAN AND THE

**New CROSLEY**  
RADIO

Hear and See Both at  
**Ford's Radio Service**  
REDLANDS THEATRE BLDG.  
Between 7 and 10 p. m.

NOTE—Although without visible signs of life, SILENT CAL will Sing, Talk and Answer Questions. The wonder of this Wonderful Age.

**Ford's Radio Service** Redlands Theatre Building  
MAIN 863 "Reliability in Radio" 105 CAJON



**COMING TO REDLANDS**

# SILENT CAL

The Mechanical Man and the

**NEW CROSLEY**  
TUESDAY, JUNE 18th  
at  
**FORD'S RADIO SERVICE**  
"RELIABILITY IN RADIO"

REDLANDS THEATRE BLDG. Phone  
105 CAJON Main 863

NOTE—Although without visible signs of life, Silent Cal will sing, talk and answer questions. Hear him between 7 and 10 P. M. The wonder of this wonderful age.

Left: Advertisement in "The Daily Facts" (Redlands, Cal.) Above: Paul W. Ford, Manager of Ford's Radio Service and "Silent Cal", the mechanical man in front of Ford's store in the Redlands Theatre Bldg. Right: Copy of handbill used to advertise the appearance of "Silent Cal."

PAUL W. FORD, MANAGER OF FORDS Radio Service, authorized Crosley Dealer in Redlands, California, was the author of a very interesting and unusual advertising feature. Ford rented, at a reasonable price, a very realistic figure of Calvin Coolidge, which he placed in a corner in front of the entrance to his store. Hidden behind this figure was placed a loud speaker, connected with an amplifier just inside the store. He ran an extension cord from this amplifier to a small microphone in a back room.

When the theater crowd came out from the show he started a short speech as follows: "I have always been known throughout the world as 'Silent Cal'. But recently, I found something that has made me talk, and talk

fast. This is the new Crosley Radio. I will now unloose my vocal cords and tell you about this marvelous instrument. When you hear more about this set, I know you will unloosen your vocal cords and arrange for a home demonstration at once. Remember, Crosley Radio at Ford's Radio Service, Redlands Theatre Building, Phone Main 863."

Ford varied the talk about Crosley receivers with jokes and songs. Because of his position he was able to see the people in front of the store without himself being seen. Hence, he caused considerable amusement by calling out to various individuals in the crowd.

He employed a youngster to stand near the doorway and ask him questions about the Crosley line. Ford could hear him distinctly from the back room, although the audience in front could only hear his voice through the loud speaker. Questions asked were like the following: "What is the price of the set displayed in the window? What is the largest radio station in the world? Describe Crosley 31, etc."

This stunt created such interest that it was carried throughout the following week until June 29.

## What! Colonel Lindbergh?

THEY EVEN USE LINDBERGH IN THE West to pick up Crosley receivers for quick delivery; or, at least, they have a pilot that could double for him.

R. J. Wall, authorized Crosley dealer in Tacoma, Washington, had to have a Jewelbox in a hurry. He called C. M. Anderson, Sales Manager of Harper-Meggee, and requested that he have a Jewelbox at the Seattle airport. Just as the Crosley set reached the field, Wall alighted in a ship piloted by Johnny

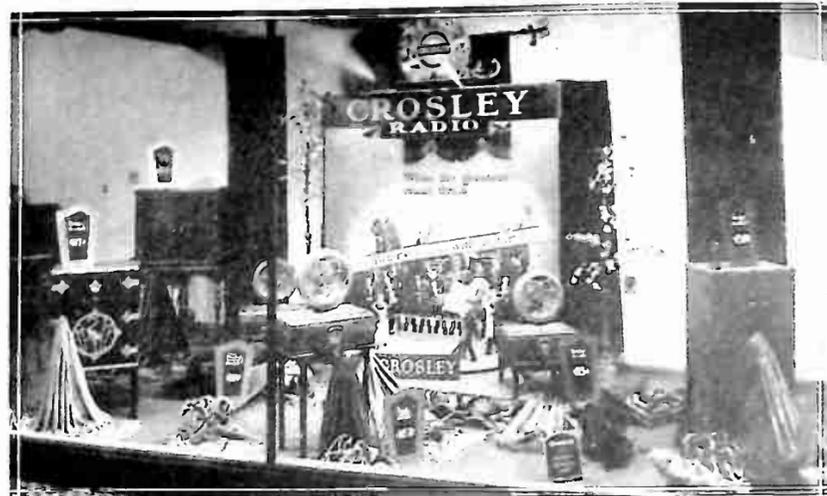


Twiss, Lindbergh's double. He picked up the receiver, hopped off and was back in Tacoma in an hour with the set for the customer.

The gentlemen pictured in the above photo from left to right are W. R. McCurdy, Purchasing Agent, C. M. Anderson, Sales Manager, W. S. Nash, Salesman for Tacoma territory of Harper-Meggee, Inc.; R. J. Wall, Crosley dealer and Johnny Twiss, pilot. Mr. Wall, in addition to being an up-to-the-minute Crosley dealer, is a licensed pilot and can handle a ship himself.

The Broadcaster takes this opportunity to commend Mr. Wall and Mr. Anderson for their prompt action. This is an example of the farsightedness that has proved of inestimable value to Crosley success in the far West.

Shuck Music Company Features Crosley



SHUCK MUSIC COMPANY ONE OF THE most prominent radio dealers in Glendale, California, features the new Crosley line with the old in this tastefully decorated window. The Crosley Dancing Doll display, appropriate

price cards and artfully arranged velvet drapery set this window apart from the ordinary. Consistent efforts to reach the passerby through effective window display is one of the most potent factors in merchandising.

How the Crosley Dealer Can Sell on Deferred Payments at the Lowest Possible Financing Cost

AT THE REQUEST OF MANY CROSLY dealers throughout the country for a special financing plan, The Crosley Radio Corporation has appointed Commercial Credit Company of Baltimore, Maryland as the official source of financing by Crosley dealers and as a result has secured from this company a specially attractive plan at extraordinarily low cost. Commercial Credit of Baltimore has 452 branch offices, 175 of which dealers can secure immediate cash in return for their installment paper. This is the widest and most flexible financing service available today.

A choice of two plans is offered. Under both plans the dealer does his own collecting. Under the first the dealer immediately secures 90% of the unpaid balance less the interest charge. 10% remainder of the unpaid balance is returned to the dealer at the end of the borrowing period. Under the second plan the dealer secures 80% of the unpaid balance immediately less the interest charge and the remaining 20% is returned to the dealer monthly.

The conditions necessary to obtain this cash for installment papers are much more lenient than is generally possible when a dealer independently finances such accounts. Full details may be obtained from the nearest Commercial Credit office—and there is probably one in the nearest large city—or by writing direct to The Commercial Credit Company, Baltimore, Md.

Never forget that you are the trustee for the good name of our house in your territory.

Lit Brother's Display



LIT BROTHERS CONSISTENTLY FEATURE Crosley displays, and the results have satisfied them that this is a most lucrative form of advertising. This window is the most prominent one in their store, facing both the street and one main entrance. The photographs in the background were those taken at the flying field when "Big News In Radio" was delivered to Philadelphia by airplane. The telegrams featured were sent to Wilkening, Inc., Crosley distributor, along the route between Philadelphia, Cincinnati and return, the messages being dropped from airplane in small parachutes at the various airports, they in turn wiring Wilkening that the plane had passed that point. In the foreground is the Crosley 41-S receiver with speaker and legs. This is the receiver delivered by plane.

This window was in for three days and attracted considerable attention and was the most talked of window display that the store had had for a long time. This method of tying up with national and local advertising should bring in solid returns.

NEW!

HAVE YOU HEARD THE new CROSLY "THE BIG NEWS IN RADIO" Let us tell you about our extended PAYMENT PLAN

The BIG NEWS IN RADIO Put a new CROSLY in YOUR HOME on a 5 day FREE TRIAL

Buy Them by the Set!

THIS beautiful set of window cards suggesting free trial; extended payment plan; trade ins; and open evenings—signs that convey your message to the passerby—is now available in the new paint process at less than the cost of printing!

These signs are in the newest of new type faces, and so closely duplicating hand-lettered signs that they appear on close inspection to be the original work of a master letterman, rather than a copy.

In keeping with Crosley policies, more than half the burden of producing these signs is borne by Crosley.

Come in and hear THE NEW CROSLY THE BIG NEWS IN RADIO TRADE IN YOUR OLD SET ASK INSIDE FOR LIBERAL ALLOWANCE PLAN

hear the NEW CROSLY the big news in radio open evenings for your convenience

Order from Your Distributor.

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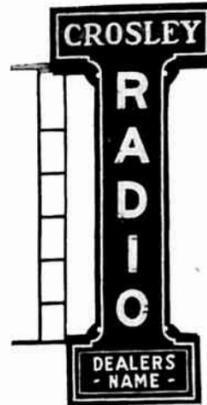
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Style CH-5. Size: 5 ft. x 3 ft. 5 in.; Name Crosley 7 in.; Radio 10 in. high; Dealers' name panel, 4 ft. long by 6 in. high. Price: \$82.00.

Style CH-5B. Same specifications as CH-5 save that 15 mil. neon border is placed around word "Radio". Price: \$178.00.

Style CV-1. This vertical sign is 9 ft. 1 in. high x 3 ft. 10 in. wide. Word Crosley 6 in. high in opal glass raised letters. Radio 10 in. high in opal glass raised letters. Dealer's panel 11 in. x 30 in. long. Price: \$97.00.



Style CH-5B

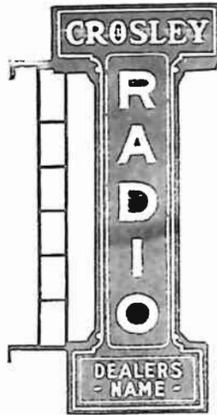
Style CV-1B. Same specifications as CV-1 save that 15 mil. red neon border is placed around word "Radio". Price: \$215.00.

Style CV-2. Same specifications as CV-1 save that word "Radio" is in 10 in. high 12 mil. red neon tubes. Price: \$190.00.

Style CV-2B. Same specifications as CV-2 save that 15 mil. red neon tube border is placed around word "Radio". Price: \$295.00.

Get in touch with your distributor.

All prices f. o. b. Lima, Ohio.



Style CV-1B

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ULTRA MODERN AND ATTRACTIVE cards size 15 x 32 in. These may be placed in your window display or in your store. They put over your message at a glance. These cards are companion cards. Beautifully colored — a dignified and high class display. Printed in the new paint process in full colors, they appear to be the original work of the sign artist. These display cards are available now. Others may be had at regular intervals.

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## Gold Metallic Banner



Here is a display item which is permanent, dignified and designed to identify your store with the Crosley line. The banner is of high grade velvet-like material with the Crosley slogan and signature worked on in gold metallics, the border is similarly decorative. The pole is of bronze, finely turned and decorative and embellished with a tassel and cord. This banner will tone up your store in a manner which cannot but reflect the dignity and quality of the line which you handle. See your distributor! Price, \$2.00 each.

# CROSLEY DEALERS' ADVANCED RADIO COURSE

This is the second lesson of an advanced course in radio published as a sequel to the "Crosley Dealer's Radio Course" which appeared in "The Crosley Broadcaster" some months ago. The advanced course will be completed in ten lessons.

## LESSON II

### AMPLIFIER CIRCUITS

Attention is called to the following typographical errors in Lesson I of this course: At the top of the first column, page 16, the biasing voltages referred to are negative (minus) voltages. Just below the middle of the page in the same column the words "biasing resistances" should read "biasing voltages." At the top of the third column, the bold faced type should read "the mutual conductance of a vacuum tube is defined as the ratio of the change in plate current to the corresponding change in grid voltage." The next few lines should read "In symbols: Mutual conductance = change in plate current ÷ corresponding change in grid voltage."

### Radio And Audio-Frequency Amplification

As explained in Lesson IX of the "Crosley Dealers' Radio Course," the incoming signals as received by a radio set are composed of high-frequency current oscillations, or alternations, fluctuating in strength at lower frequencies. The high-frequency oscillations serve as a "carrier" for the lower frequency strength fluctuations. The low-frequency fluctuations

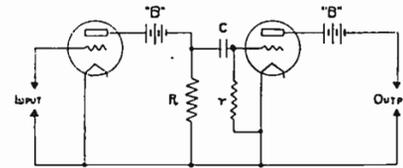


Fig. 1. Resistance Coupled Amplifier

correspond to the voice waves at the studio, and vary in frequency from a few hundred to five thousand or more cycles per second. Such frequencies are called "audio frequencies." The rapid oscillations, which serve as the carrier of the audio frequencies, vary in frequency (in the case of broadcasting) from 300,000 to 800,000 cycles per second. Such frequencies are known as "radio frequencies." The incoming signal, then, consists of a radio-frequency carrier current, on which is superimposed the effect of the voice at the studio, in the form of audio-frequency modulations or fluctuations in strength.

It is the object of the radio receiver both to amplify this incoming signal until it is of sufficient power to operate a loudspeaker, and to separate out the audio-frequency component of the oscillations and deliver this alone to the loudspeaker. The device which separates the audio-frequency component from the radio-frequency component, of the oscillations is known as the "detector." In modern receivers, the signal is amplified both before it reaches the detector and after it leaves the detector. The amplifiers preceding the detector are known as "audio-frequency amplifiers," since the current amplified by them consists of the radio-frequency signal, unmodified by the detector. The amplifier following the detector are known as audio-frequency amplifiers, since the currents amplified by them consist of the audio-frequency component of the in-

coming signal, the radio-frequency component having been removed by the detector system.

### Comparison of Radio-Frequency and Audio-Frequency Amplifiers

The radio-frequency amplifying system is usually somewhat different from the audio-frequency amplifying system, inasmuch as it must perform different functions. It is in the radio-frequency amplifier system that the selection of the desired signal takes place. The radio-frequency amplifiers (at least some of them) are therefore tuned. The tuning is usually accomplished by shunting variable condensers across inductances in the grid circuits of the tubes. In the audio-frequency system, on the other hand, it is desirable to amplify all frequencies equally within the audio range, rather than to eliminate some frequencies as in the radio-frequency system. The audio amplifier circuits are therefore untuned, and are designed so as to amplify equally, as nearly as possible, all frequencies within the usual audio range.

As was explained in the preceding course, the choking effect of inductances increases enormously at high frequencies. Consequently the values of inductance used in radio-frequency amplifier coils are much less than those used in audio-frequency amplifier coils. Further, the hysteresis losses in iron become quite large at high frequencies, so that air-cored coils and transformers are used in radio-frequency amplifier systems while iron-cored coils are used in audio systems. The impedance of condensers is less at high than at low frequencies. The values of capacity for condensers in radio-frequency circuits, therefore, differ from those used in audio-frequency circuits.

### Methods of Coupling Amplifier Stages

The amplifying systems of radio receivers are divided into three classes, according to the manner in which the tubes are connected, or "coupled," to each other. These methods of coupling are:

#### Resistance Coupling.

#### Inductance or Choke Coupling.

#### Transformer Coupling.

A typical resistance coupled amplifier is shown in figure 1. It was explained in the preceding lesson that in order to get large voltage fluctuations, corresponding to high voltage amplification, in the plate circuit of the tube, it is necessary that a high resistance or impedance be placed in the plate circuit. If there is no resistance or impedance in the plate circuit of the tube, all of the voltage fluctuations, corresponding to the amplified replica of the incoming signal, will be across the impedance of the tube itself. If a resistance "R" is placed in the plate circuit of the tube connected to the incoming signal, the amplified voltage fluctuations corresponding to the incoming signal will be reproduced across this resistance.

By connecting the grid circuit of the following tube across the resistance, "R" the amplified signal fluctuations in the plate circuit of the first tube may be applied to the second tube. The purpose of the condenser "C" is to prevent the positive voltage drop of the "B"

battery current, through the resistance "R," from being impressed on the grid of the second tube. As was explained in the preceding lesson, it is desirable to operate the tube with a negative, not a positive, mean voltage. If the condenser "C" were not introduced in the grid circuit of the second tube the fall of potential through the resistance "R" would make the grid positive with respect to the filament.

Because of the condenser "C," a charge of negative electrons would collect on the grid of the second tube, eventually blocking the tube, if means were not provided, in the form of the resistance "r" for this charge to leak off. For the leak resistance "r" an ordinary grid leak may be used.

### Advantages and Disadvantages of Resistance Coupling

The value of the resistance "R" must be quite high—of the order of 100,000 ohms. For this reason a high-voltage plate "B" battery must be used in order to send an appreciable current through the plate circuit. This, together with the high-power losses in the resistance and consequent inefficiency of the system, is a disadvantage of resistance coupling.

If a resistance coupled amplifier is used

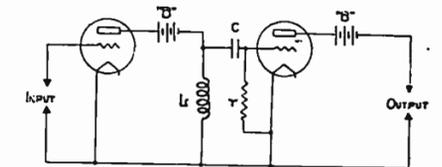


Fig. 2. Inductance Coupled Amplifier

for amplifying radio-frequencies, the condenser "C" may be of small capacity, since condensers pass high frequencies with ease. If the amplifier is to be used for audio-frequencies, however, the condenser "C" must be of large capacity, in order not to offer too much impedance to the low frequency current.

In addition to the disadvantages mentioned above, the fact that it is desirable to be able to tune radio-frequency circuits to the incoming signal as a means of selecting the desired signal operates against using simple resistance coupling for the radio-frequency stages of broadcast receivers.

In the audio-frequency stages, resistance-coupled amplification, properly applied, has the advantage of amplifying all audio-frequencies readily, thus giving true reproduction, free from distortion. Inasmuch as it is now possible to use more efficient means of amplification and at the same time reduce distortion to a minimum, however, as will be explained later, the disadvantages of resistance coupling have caused it to practically disappear even in the audio amplifier systems of commercial broadcast receivers. The use of resistance-coupled amplification is now largely confined to special laboratory equipment for testing sound devices, and for similar service.

### Impedance Coupled Amplifiers

If, instead of a resistance, a choke coil or impedance coil is connected in the circuit

as shown in figure 2, some of the advantages of resistance amplification are gained without the high direct-current resistance incident to resistance amplification. The impedance coil offers strong opposition to alternating currents, so that the voltage fluctuations of the signal are reproduced across it as desired, but its resistance to direct currents is low, so that a plate "B" battery of low voltage may be used. The loss of plate battery power in the impedance coil is much less than in the resistance, and the efficiency is correspondingly greater.

Impedance coupling, when properly applied, has to a considerable degree the advantage of practically distortionless amplification, mentioned above in connection with resistance amplification. It may be used in either radio-frequency or audio-frequency circuits. In radio-frequency circuits air-cored coils are used, because the hysteresis losses in iron-cored coils would greatly impair their efficiency and because the impedance of air-cored coils at the high radio-frequency is as great as is desired. The radio-frequency impedance coupling coils may be shunted by

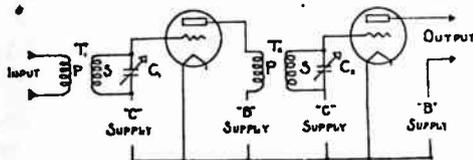


Fig. 3. Transformer Coupled Amplifier

variable condensers so that the circuits may be tuned to the incoming signal. Each stage of amplification will then serve not only as a means of amplification but as a means of selecting the desired signal. In audio-frequency circuits, the impedance coils used have iron cores, since high inductances are required at audio-frequencies and hysteresis losses are low at these frequencies, iron-cored coils being much more efficient than air-cored ones.

Despite their advantages as far as true, distortionless reproduction is concerned, impedance amplifiers are not used extensively in broadcast receivers because the amount of amplification obtained with them is not as great as with transformer-coupled amplifiers. Their use is largely confined to broadcasting station equipment, and the like.

#### Transformer-Coupled Amplifiers

If the output circuit of one tube is connected to the input circuit of the following tube by means of a transformer, as shown in figure 3, the ratio of this transformer secondary to primary winding may be so regulated as to obtain a certain amount of voltage amplification in the transformer itself (as was outlined in the preceding course, the ratio of secondary voltage fluctuations to primary voltage fluctuations is approximately proportional to the ratio of secondary turns to primary turns). If the transformer is designed properly, the total amplification of the tube plus the transformer will result in the application of a highly-amplified replica of the signal to the grid circuit of the second tube.

Because of their great efficiency and high amplification, transformer-coupled amplifiers have come into almost universal use in broadcast receiver construction. In the radio-frequency circuits, air-cored transformers are used, and in the audio-frequency circuits iron-

cored transformers, for the reasons outlined above in connection with impedance amplification. The air-cored transformers in the radio-frequency circuits usually have their secondaries shunted by variable condensers, so that the grid circuits of the tubes may be tuned to the incoming signal. By using two or more cascade stages of tuned radio-frequency amplification in this way, a high degree of selectivity is obtained.

The chief objection to transformer coupling is that there are certain difficulties in designing a transformer-coupled amplifier which has high efficiency and is at the same time comparatively free from distortion. There are several reasons for this, among which may be mentioned the fact that the capacity effect between the turns of the coils (known as distributed capacity) effectively shunts a condenser across the coils, creating a tuned circuit more responsive to the higher-frequencies than to the lower ones. Further, if the transformer is of the iron-core type, working the core too near its saturation point may introduce distortion. The total effect of all the factors entering into transformer-coupled amplification is to make it difficult to obtain sufficient amplification of the very low audio-frequencies without unduly amplifying the high audio-frequencies.

By careful design, however, it is possible to build transformer-coupled amplifier systems which have practically even amplification throughout a range of from 100 to 300 cycles up to 5000 or more cycles. Such a range includes all of the frequencies ordinarily considered essential to the proper reproduction of speech and music. A carefully-designed, transformer-coupled amplifier system of this kind reproduces as faithfully as can be desired, without distortion, and has the advantage of great amplification, with a minimum of tubes and high over-all efficiency.

#### Overcoming Distortion

There is another important point with regard to faithful reproduction that should be considered. Quite often it is possible to combine units, which by themselves do not reproduce as faithfully as might be desired, to get a resultant reproduction that is almost perfect. For instance, an audio-frequency amplifying system the amplification of which falls off at certain frequencies may be combined with a radio-frequency amplifying and detector system which accentuates these audio-frequencies, so as to produce practically uniform amplification throughout the entire range of audio-frequencies.

As an example of this method of combining units so as to obtain ideal results from the combination, the design of photographic lenses is illustrative. A simple, single lens will not produce a clear sharp picture, except under very particular circumstances. The standard method of constructing fine photographic lenses is to combine single lenses, imperfect in themselves, in such a way that they balance out each other's imperfections, so that the combination is practically perfect.

The same method may be used in radio receiver design. What is desired is not so much a low-efficiency receiver, each unit of which is perfect in itself, but a high-efficiency receiver with its units so fitted together and so designed that when it is used with the proper loudspeaker it will reproduce faithfully the program as it sounds at the broadcasting

station itself. In order to design receivers in this way, it is necessary to have very elaborate testing equipment. By means of especially designed equipment in the Crosley Engineering Department, the various parts of the complete amplifying system of the receiver may be tested both individually and together as the design of the receiver progresses, and modifications may be made in the individual units so as to keep the over all efficiency as high as possible and at the same time obtain distortionless reproduction.

#### Transfer of Energy from Output to Input

In Lesson VIII of the preceding course it was explained that under certain conditions sufficient energy may be transferred from the output of a tube back into its input circuit to maintain the tube in a constant state of oscillations. In such a condition the tube acts as a generator of alternating current, or rather as a converter, changing the direct current of the "B" battery into fluctuating current oscillations. There are many instances in which this ability of radio tubes to maintain sustained oscillations is valuable, as for example in generating the currents for broadcasting. In amplifying systems, however, the tendency of tubes to get into a state of self-oscillations is frequently disastrous, resulting in the signal being hopelessly "hashed". In amplifier circuits, therefore precautions must be taken to guard against these sustained oscillations.

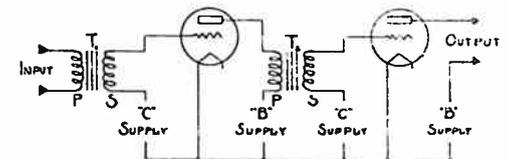


Fig. 4. Transformer Coupled Amplifier

The transfer of energy from the output to the input circuit of the tube, resulting in the unwanted oscillations, may take place through the mutual capacity of the tube elements, which affords a means of coupling the circuits together, or because of external coupling effects between different parts of the circuit. Various means are employed to overcome these effects, including shielding, resistance balancing, neutrodyning, the use of screen grid tubes, and the like. These methods will be discussed in a later lesson, after the action of radio tubes as detectors and oscillators has been considered.

#### QUESTIONS

To get the most out of the course, answer the following questions on a sheet of paper, and mail them to the Editor of the "Broadcaster". You will be advised if your answers are correct, or wherein they are wrong. Did you follow the lessons of the previous course?

1. Is it possible to obtain greater voltage amplification per stage than the amplification constant of the tube?
2. What type of amplifier coupling is used in Crosley receivers? Why?
3. Are all of the radio-frequency stages tuned in the Crosley Showbox receiver? Is the detector stage tuned?
4. How would you explain the distorted reproduction obtained when the volume control of a receiver is turned on full in receiving extremely powerful signals?
5. Is it practical to use an unlimited number of stages of amplification? Explain.