

The CROSLLEY

Broadcaster

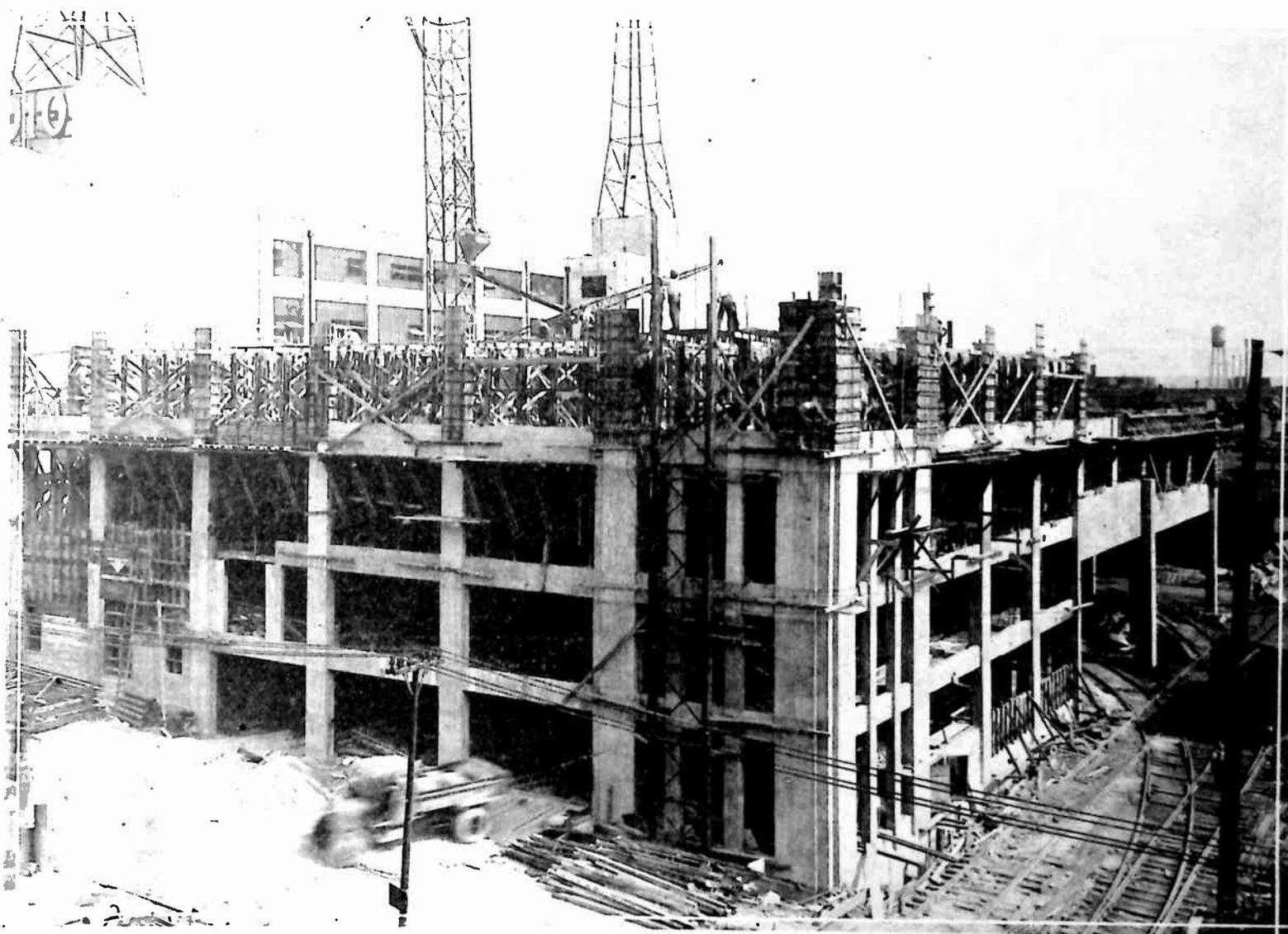


VOL. VIII.

AUGUST 15, 1929

NO. 16.

Crosley Progress



THE NEW HOME OF THE CROSLLEY Radio Corporation is growing with such rapidity that it is almost impossible to keep up to date on pictures of production. One month ago the new eight story skyscraper building was merely a hole in the ground. Now almost four stories have been constructed on the new building, while the 600 foot conveyor building, bare steel a month ago, is practically completed.

The new plant adds 222,000 square feet of

floor space to the present manufacturing facilities. This new building is designed to interlock with the straight line system of production now in use in Plant No. 1. Three years ago, when a large addition to plant No. 1 was erected care was taken to construct and layout the building in such a manner that there would be no wasted space. A system of straight line production such as is used in the more efficient motor car plants in Detroit was installed and this has been material in increasing Crosley production. Through this

system it has been possible for The Crosley Radio Corporation to market successfully the lowest priced, most efficient A. C. electric radio receiving set in the radio field today. In the new plant the straight line system will be continued and amplified.

It is indeed a tribute to the genius of Powel Crosley, Jr., and the able efficient organization he has built up, that this great factory for the increased production of fine radio receivers has been developed.



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

NEUTRODYNE 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.

Radio and the Market

AN ARTICLE, QUOTING DR. JULIUS Klein, Assistant Secretary of Commerce, on the condition of the radio market and its possibility of saturation, appeared in the July 15th edition of the United States Daily. With Crosley Radio Corporation and other great manufacturers getting into their stride of production, the contents of this article seemed of peculiar significance. We take pleasure in quoting excerpts:

"Radio sets totalling 200,000,000 would be required to provide facilities for the 1,000,000,000 persons in the world within range of broadcasting stations now established," the Assistant Secretary of Commerce, Dr. Julius Klein, stated in a discussion of the world market for radio equipment. Dr. Klein gave the figures, which he said were based on five listeners to every radio set, to emphasize his conviction that there has been no approach to saturation in the radio market.

American manufacturers of radio receiving sets have followed in the footsteps of the automobile industry by going in for quantity production. Several producers have passed the million mark, and their sets have established themselves almost as firmly in foreign markets as American motor cars have done. A survey recently conducted by the Department of Commerce showed that there were upward of 20,000,000 receiving sets in use throughout the world, of which nearly two-thirds were of American origin.

Crosley Conveyor Bridge



THE STRAIGHT LINE MASS PRODUCTION methods of the Crosley Radio Corporation were made possible by the conveyor system used in all of the Crosley plants. An overhead chain carries Crosley chassis from one department to another. The new conveyor building, stretching 600 feet along the spur track, part of which may be seen at the

left of the picture is across the street from the new Crosley 8 story factory and office building seen at the right. In order that there will be no unnecessary handling of Crosley chassis the conveyor line had to be constructed straight through. The conveyor chain will pass from the skyscraper building to the conveyor bridge now under construction shown in the photograph above.

Sell the Half Sold Prospect

NATIONAL ADVERTISING SUCH AS magazines, billboards and newspapers create an enormous burden of half sold prospects.

The dealer is the one who must do something to complete the actual sale of at least a portion of this vast number of "almost sales."

Obviously it is necessary for the dealer to do something to attract attention—hold the interest and create the desire to "come in and buy a Crosley!" Thereby turning the "almost" into an "all the way," dollars and cents sale.

The most powerful means of tying-in the dealer has is his window display. A complete and satisfactory tie-up would be for him to use the newspapers and back them up with the window display.

Window display material is the cheapest and most effective medium of advertising that the dealer has. Too much importance cannot be accorded this phase of advertising. Nothing is more attractive—more alluring—more apt to translate passing fancy into actual sales than good looking window displays.

To stimulate and maintain the dealer's interest in this phase of display, The Crosley Broadcaster, the official publication of the Crosley Radio Corporation, will feature, each month, a picture of the most outstanding display submitted. This will enable the individual dealer to see what the rest of the dealer world is doing in this regard and also give him ideas on how he may improve his own.

Just what particular factor will complete the sale, half made by the national advertising cannot be arbitrarily pointed out. Whether it is newspaper advertising—window display—personal contact or some other factor is difficult to say.

Naturally it will vary according to the individual. The safest procedure is to take advantage of all the sources of attraction and sales resource, leaving nothing to chance.



ON PAGE 4 OF THIS ISSUE IS AN ARTICLE by Grant Layng, Vice-President of the Twentieth Century Radio Corporation, Crosley distributor in the Metropolitan area of New York. Mr. Layng has explained the methods used by the Twentieth Century in securing and getting in touch with prospective customers by telephone. He claims a successful contacting of 40% of calls; and that dealers using his system would get the same results.

The cost to dealers is comparatively low. Where no contract rate prevails the cost would be approximately \$30.00. On contract, the cost of the phone system would approximate \$100. He points out that two sales would offset maximum cost.

Mr. Layng further states that Twentieth Century sales for February, March and April of this year were increased three times that of the same period last year, and gives credit for the increase to the telephone canvass system.

This system has been developed for the use of Twentieth Century dealers. Were it but half as successful as Mr. Layng states, the plan would more than repay the dealer employing it under the guidance of Twentieth Century.

Powel Crosley Outlines Radio's Responsibilities

Says WLW Represents Determination to Serve Every Radio Home in America

"THE PRESENT WLW IS THE OUTGROWTH of our determination to establish a station which would serve, under reasonable conditions, practically every radio home in America."

This statement by Powel Crosley, Jr., president of the Crosley Radio Corporation which owns WLW, is made in a full page advertisement of station WLW which appeared in the July 27 number of a national magazine (The Saturday Evening Post).

INTERNATIONAL SCOPE

His basic ideas on the responsibilities of the owners of radio stations are expressed in the following paragraphs:

"It appears from thousands of listener documents received monthly that WLW is constantly available and clearly heard in every community in America and over a good part of the world—thus clearly demonstrating that this station is national—even international in its service and influence.

CONTINUOUS PROGRAM

"A vast audience such as this has naturally placed on WLW a greater responsibility than has ever been attached to any single station. In thousands of communities WLW is practically the only station used. This requires not only a wide range of program features, but a constant program throughout the day and most of the night.

"The casual listener in the home would find it interesting if he could only step back of the scenes and see the WLW organization at work—the constant stream of artists necessary every day to provide nearly nineteen hours of news, education, and entertainment.

EVERYTHING TO AUDIENCE

"School. Newspaper. Church. Dance. Concert. Cook book. Physical education instructor. Advisor. Entertainer of children. Minstrel show. Counsellor. Neighbor. Doctor. Nurse. Companion soloist. Circus. Historian. Story teller. Inspirer. Friend.

"So goes WLW for nearly nineteen hours every day with something interesting, something entertaining for the great unseen audience which it serves."

Service School

WE ARE REPRODUCING IN THE DISTRIBUTOR'S section of this issue an illustrated account of the Geller Ward & Hasner dealer service school. From what we understand this school met with complete success. In the last issue we mentioned the Window Display classes of Kierullf & Ravenscroft, and their contemplated school in Salesmanship. These are indeed excellent strides forward in the right direction. The men who are the best informed about their work from every angle are usually the men who succeed.

Opera Stars Sing At WLW Recital

TWO OF THE MOST FAVORABLY known stars of American grand opera were heard in a joint recital at the Crosley radio station, WLW, on Friday, August 9, from 11:00 p. m. until midnight.

Coe Glade, contralto and Robert Ringling, bass-baritone made their first appearance before the microphone. Neither of the two singers had consented to make radio appearances before this. However, Ringling is a close friend of Powel Crosley, Jr., and a neighbor at Sarasota, Florida, Crosley's winter home. During last winter both men were at Sarasota and arranged for the concert.

Coe Glade attained a national musical reputation in the past season of the Chicago Civic Opera company when she created a sensation in the role of "Carmen." Other stellar parts were as loudly proclaimed as the season progressed. Critics say she has shown a wonderful artistry, and they predict a continuation of her career so brilliantly begun.

At WLW on August 9, she sang the "Habenera" from "Carmen", "My Heart at Thy Sweet Voice" from "Samson and Delilah", and a group of lighter songs.

Ringling is regarded as one of the greatest interpreters of Wagnerian opera. He is one of the few opera singers who attempt the difficult passages of "Beckmesser" in "Die Meistersinger" and he has sung it with the great opera companies of the world.

His numbers over WLW included "Evening Star" from "Tannhauser", and "Largo el Factorum" from "Barbier de Seville".

At conclusion, Miss Glade and Ringling sang "Home to Our Mountains", a duet from "Il Trovatore."

The Crosley Little Symphony Orchestra conducted by William Stoess, musical director of WLW and WSAI, accompanied the singers.

Educational Programs Popular

LAST FALL ARRANGEMENTS WERE completed between the University of Cincinnati and The Crosley Radio Corporation whereby the educational institution agreed to go on the air twice a week with fifteen-minute talks by its professors.

Comments from listeners who praise this offering of the University and Station WLW are being received constantly from every corner of the continent. They bear ample evidence that the proportion of the radio audience classed as "jazzminded" is not so large as commonly thought.

It is a gratifying thought that The Crosley Radio Corporation is and will be one of the greatest educational media in the country if not the greatest.

The Crosley Autogym Electric Vibrator may, on request, be furnished with 110 volt D. C. motor at the small additional cost of \$5.00 list. The price therefore of the Crosley Autogym equipped to operate from D. C. supply is \$60.00 list.



Home demonstration is one of the most effective methods of selling merchandise. Most of the nationally known specialties owe their start to efforts put into demonstrating the product in the home, and convincing the consumer directly of its merits.

We in the radio business have been very fortunate. As improvements have come along consumer acceptance has been more or less automatically created. This, however, will be a highly competitive year in radio and the time is coming, in the very near future perhaps, when concentrated sales effort will be necessary.

The dealer organization that recognizes the value of canvassing and sane home demonstration work, is therefore, building on a sound foundation, and will be assured of a steady volume even in the midst of keen competition.

We feel that the line of radio which we have to offer you this season will readily stand any test, and that demonstrations of Crosley merchandise in the home of the consumer will mean more sales for you.

We urge you, therefore, to consider the value of home demonstrations as the best evidence you can give to back up your confidence in Crosley. Have your salesman take a Crosley model into the home of the consumer. Give the merchandise a chance to prove its quality, and you will cash in on your share of the profits that Crosley will bring its many thousands of dealers this year.

Powel Crosley Jr.

Selling Radio by Telephone

HERBERT HOOVER, WHEN SECRETARY OF Commerce, indicated that economy and improvement in distribution must be the key note of America's endeavors. Only one great invention has been fully employed in distribution—the printing press. Printing in the form of advertising has been an enormous productive force of selling economy, but it is the only large offering by distributors to balance the many progressive steps taken in the field of manufacturing.

THE DEVELOPMENT OF TELEPHONE MERCHANDIZING.

Another great invention equally available can be employed with great success in distribution and selling—the telephone. Like advertising half a century ago, the use today of the telephone in selling is in its infancy. Pioneers in its development today are securing substantial advantages, just as the early advertisers were many years ahead of their competitors and profited accordingly.

PLANNING THE CAMPAIGN

In planning our campaign we found that the local representatives in the telephone company were glad to co-operate and had considerable knowledge of what had been accomplished in selling by telephone and what methods had been employed by successful users. We have their assurance that similar assistance is available throughout the United States in local telephone companies of the Bell system. We found in the first instance that there was available, at a small price, a list of telephone subscribers arranged by street addresses. This we understand is a service available only in large cities and probably only necessary for our purposes where the geographical boundaries of the dealer's territory are not marked by self contained units. We believe that where the printed service is not available you can obtain from your local Bell office a typewritten list of subscribers on a geographical arrangement, the only charge to be involved would probably be the stenographic work.

TELEPHONE SUBSCRIBERS BEST BUYERS

On the theory that subscribers to telephone service represent considerable of the buying power of any territory, we proceeded to build our prospect lists from those whose names are published in the directory. For each dealer we compiled a list of telephone users in his territory and told him of our belief that a telephone canvass of these prospects would be productive in uncovering a great number of potential customers at a lower cost than any other method of approach. In our Metropolitan area we particularly pointed out that his main problem was to contact those who were closest to him and it was impossible to accomplish this result economically through the normal medium. The Metropolitan area newspaper rates are extremely high and the dealer would be paying for a great deal of waste circulation. On the other hand, we were able to compile a list which could give him the names of individuals in any definite area he desired.

A SPECIAL TELEPHONE SALES FORCE

Our first plan covered merely the giving to the dealer of these lists, charging him only the cost of the stenographic work involved in copy-

ing down the names. We soon discovered, however, that although all dealers were anxious to get this material there was but a small percentage who used them after the list was received. Although their intentions were good, they apparently could neither find the time nor did they have the knowledge to follow up these prospects in an aggressive fashion. We, therefore, took on a man who had had some experience in outside selling and through the co-operation of the Telephone Company we were able to have him efficiently trained in telephone selling. With this man as the manager of our department we obtained six others which he in turn trained, so that we had the personnel available, using five men and one woman for our outside activity.

TRAINING THE PERSONNEL

In obtaining a personnel we guaranteed the men \$25.00 a week as a basic salary and suggest to them that they make arrangements with the dealer to pay them a commission on any set sales that they can make during the evenings of the week that they operate in the dealer's store. The telephone solicitor can usually average about \$40.00 a week so that it is possible to obtain the type of man needed for this work. We have used one woman with considerable success, particularly in certain communities, but we have found it difficult to obtain women who understand the radio business sufficiently to carry on this work, especially where service is involved. We then offered to furnish the dealer with one of these telephone solicitors, charging him \$5.00 a day, which represented the salary that we paid, and we contracted for a week in which the telephone solicitor would work in the dealer's store. A list was furnished having a thousand names in any locality the dealer wished to work, and also 500 cards were sent out, on which the telephone solicitor made a record of successful contacts, the cards being adaptable to either service calls or set sales. As in practically every case the owner of a battery set is an ultimate prospect for an electric machine, we have stressed the necessity of an efficient service department to service the battery machines, so that when the consumer is in the market for an electric set the dealer who has given him efficient service will be the one to obtain the new sale.

HOW TO APPROACH THE PROSPECT

Regarding the approach, it cannot be said too emphatically that there is no future for telephone sales work which attempts to break into the privacy of the home in an aggressive uninvited manner. Serious harm can be done by indiscriminate, discourteous, and over aggressive use of telephone selling on a cold canvass approach. The use of a telephone as a follow-up from previously mailed advertising is more desirable when it is possible to do this. A selected letter with a mailing piece sent to the prospect will pave the way and obtain a great many more results than if the prospect is called without any previous knowledge of the organization which is calling. The standard procedure of approach on a telephone canvass is worked out along the following basis:

The telephone solicitor has in front of him the telephone list and a blank card on the front side of which is data to be checked when the customer is contacted. The opening re-

mark is as follows: "Good morning, Mrs. This is the A. & B. Radio Shop. We are calling to find out how your radio is working." Mrs. by her answer then indicates whether she is the owner of a radio set or whether she is not. If she is the owner the solicitor tells of the service available from his organization and attempts to find out whether the customer has a battery set, how long she has had it, and if she is interested in a new electric machine. As the customer replies to these inquiries the card is checked so that at the end of the conversation the card tells the entire story covering that particular prospect. Where the prospect is not interested in an immediate change but feels that her old set is satisfactory, the service is stressed and a follow-up letter is sent thanking the customer, assuring her that the A & B Radio Shop stands ready to give this service any time it is needed. The card is then filed in the service prospect list to be followed up at the discretion of the dealer.

If, on the other hand, the customer has not a radio set, the solicitor attempts to obtain information as to whether she would be interested in obtaining one and if she is interested how soon a demonstration may be arranged, and so forth. This card is then filed in the "set prospect" file and the data noted as to the approximate date it is to be followed up.

PERCENTAGE OF SUCCESSFUL CONTACTS

In the normal area it will be found that from the hours of 9:30 A. M. until 4:30 P. M. out of 100 telephone calls approximately 75 people will be contacted. The morning calls are, of course, more productive of results than the afternoon calls, as in the afternoon a great many women in the household are out.

Covering the total results of our past month's endeavor, out of 5000 telephone subscriber's calls we secured interviews in 2,940 cases. We have uncovered definite prospects for sales of sets in 294 instances and prospects for service on 903 calls. We obtained immediate service work on 25 calls and immediate set sales on 10 calls. In other words, out of a total of 2,940 contacts on the telephone we obtained 1,232 prospects.

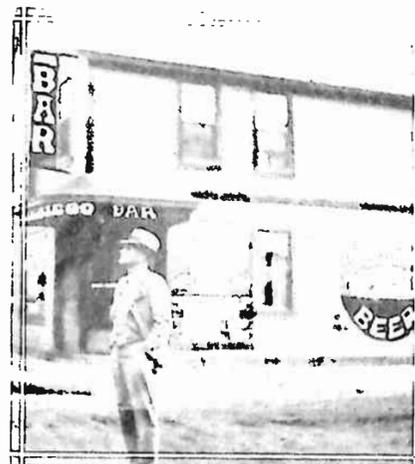
After the man has completed his week's work he leaves the dealers store, giving him the balance of the list to be called and also the remainder of the cards to be filled out. The dealer is then followed up by the man in charge of this work from the office to be sure that he continues the system as it has been our experience that unless the work is carried on for at least a month full benefit is not obtained.

We are convinced that telephone selling has a definite place in our distribution work and believe that we are utilizing a medium that is sound, low in cost, and permits the salesman to exercise his talents on a greater number of potential customers than he can conceivably reach in person. It is mass selling and distribution compared to volume production and manufacture and may be in a small measure the distributor's contribution to the startling advances in the radio industry.

From an Address Delivered
By GRANT LAYNG, V. Pres.,
20TH CENTURY RADIO CORP.

CROSLEY DISTRIBUTORS

Intrepid Distributor Visits
Land of the Spree and Home
of the Grave



A. E. RAVENSCROFT OF KIERULFF & Ravenscroft, Crosley distributor in California, recently made a visit to Mexico. "The trip," Mr. Ravenscroft was laughingly heard to say, "was one of purely business." At this, our representative broke into gales of merriment.

We present, for the edification of those who live under the 18th Amendment, a photograph of Mr. Ravenscroft looking over the Mexican ciudad which he decided to purchase. (Editors Note: This decision persisted for only a few days.) The building in the background is the place where Mr. Ravenscroft's decision was formed. Buildings of this type, it is understood, are now extinct in the United States. This is perhaps the reason for Mr. Ravenscroft's desire to buy. The building alone would be a genuine antique in the states.

There is a possibility that Mr. Ravenscroft wanted to start a free for all—no difficult matter in the land of Rum and Revolution—and it is possible that he intended to utilize the city as a base of operations.

However, the city still belongs to the Republic of Mexico and Mr. Ravenscroft is home, rested and happy.

Hudson-Ross, Inc., Crosley distributor in Chicago, uses a form called a "Crosleygram". The heading is in brilliant red ink on bright yellow bond stock and is used to bring the dealers' attention to price revisions, co-operative advertising, and other important news to Crosley dealers.

Fargo Air Campaign



THE FARGO MOTOR SUPPLY CORPORATION of Fargo, N. D., are delivering their dealers the first new sample Crosley receivers by plane. This campaign follows up the Crosley air campaign of June. The Fargo Crosley dealers are co-operating in their utmost to put the plane campaign over in their various communities. The campaign offers much material in the way of local publicity and the dealers are not backward about getting their share.



Poster Used By Fargo.

The Fargo Big Show was inaugurated when H. F. Jaax, Crosley representative handed the first model, a Crosley 21, destined for delivery to Hoskins Meyer, Crosley dealer in Bismark, N. D., to Cy McCarty, the pilot.

In the picture from left to right are the relief pilot, Cy McCarty, H. F. Jaax (handing set to McCarty), Jack Goeson, Secretary & Treasurer of Fargo Motor, and H. B. Bonde, Sales Manager of Fargo Motor.

The picture above shows the type of window card and outdoor poster used by Fargo Motor in putting over their air campaign.

Doubleday-Hill Big News Ship
Piloted by Well-Known Good
Will Flier



This photograph shows representatives of Doubleday-Hill Electric Company holding letters of appreciation from Powel Crosley, Jr., and the President of the Cincinnati Chamber of Commerce. The picture was taken just before they hopped off to deliver the Big News in Radio in the form of a Crosley 41-S receiver to Washington, D. C. B. S. Thompson, nationally known good will flier, piloted the Doubleday-Hill ship to the Cincinnati airport and return.

This Shows Why Radio Engineers Grow Grey Haired

Lightning struck the 50,000 watt transmitter of the Crosley radio station WLW, seven times in one hour during a recent electrical storm.

The station was off the air only one and three-fifths minutes because of the hits. Quick action on the part of the transmitter engineers kept it from losing more time.

One man stood by the main contactor to close it when it went out. Another stood by the time-delay relays to force them into position each time the lightning discharge knocked the transmitter off the air. Since the rotating machinery was not allowed to come to a stop, no damage was done by "rushing" the time delay relays and the break in the broadcasting was only once of more than five seconds duration.

IT'S A GIFT!...

The CROSLEY BANDBOX \$20 WITHOUT ACCESSORIES

THE CROSLEY BANDBOX, THE MOST popular battery set in the field last year, is being offered to you at the exceptionally low price of \$20.00. This six tube, genuine Neutrodyne battery set formerly sold at \$55.00.

These sets are specially designed for the rural markets where electric current is not available. This receiver should also find ready market among campers and tourists.

We are offering this remaining NEW STOCK

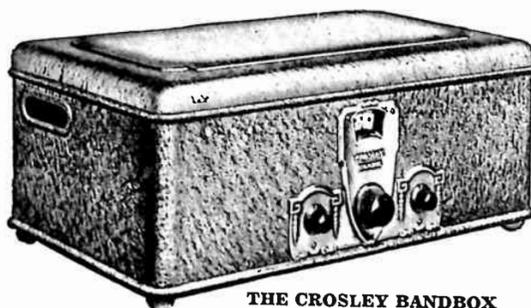
IN THE ORIGINAL CARTON TO YOU rather than selling to operators who have already made offers for the remaining stock. This is done to prevent any organization from dumping a large number of these good, low-priced receivers in one or several markets, and ruining those markets for immediate sale of receivers of the new line.

To prevent this in any locality, Crosley dealers are limited to fifteen sets each. Only

authorized Crosley dealers may purchase these receivers.

Cash, money order, or certified check to the extent of at least 25% of your order must be mailed with the coupon below. Goods ordered will be shipped express or freight, as you may prefer, C. O. D. balance.

Fill out the coupon below and get in on this exceptional offer. There are only a limited number of Crosley Bandboxes in stock.



THE CROSLEY BANDBOX
FORMERLY \$55 — NOW \$20!



ORDER FOR CROSLEY BANDBOXES

The Crosley Radio Corporation, Cincinnati, Ohio. DATE: _____

Gentlemen: Ship at once ___ Crosley Bandboxes via (FREIGHT EXPRESS). I enclose herewith \$ ___ in (CASH MONEY ORDER CERTIFIED CHECK) covering 25% of this order; balance C.O.D.

NAME _____

POST OFFICE ADDRESS _____

Showboat Advertises Crosley

TOWER-BINFORD ELECTRIC & MANUFACTURING Company, Crosley distributor in Richmond, Virginia, has succeeded in placing advertising signs on a showboat plying the navigable creeks and rivers of eastern Virginia.

The showboat, fast disappearing as a medium for dramatic presentation, has been revived in a popular novel. These floating theaters of the American river were once a thrilling and wonderful sight to the inhabitants of the small river towns who had little opportunity for dramatic amusement. The visit of the showboat was an event looked forward to for months. Today one may still see them and they attract large crowds more because of what they were, than what they are. The charm of a by-gone day, the atmosphere of an older and different era in our history still hovers around them.

Tower-Binford is capitalizing on the drawing power of the showboat by placing large advertisements on the showboat's decks. One of them reads:

50% OF ALL ELECTRIC RADIOS IN VIRGINIA ARE CROSLEY

THERE MUST BE A REASON

The other:

IN OLD VIRGINIA CROSLEY RADIO IS SUPREME

THERE IS AN AUTHORIZED DEALER NEAR YOU

It would be interesting to learn to what extent these advertisements pay for themselves.

Ott-Heiskell Essay Contest

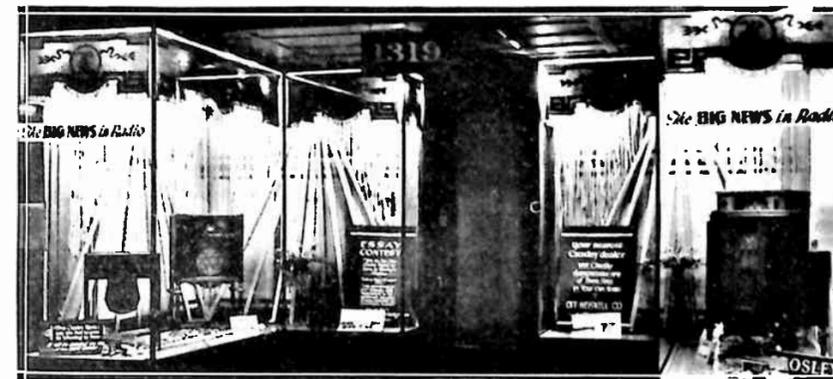
A CROSLEY 41-S RECEIVER WAS THE prize offered by Ott-Heiskell Company, Crosley distributor in Wheeling, W. Va., for the best essay written by high school students in Wheeling, W. Va. The subject was "The Significance of the Ott-Heiskell Co's. participation in the Nation Wide Delivery of Radio Receivers to Commercial Aviation."

James V. Fette, 18, of E. 29th St., Wheeling, was announced the winner of the Crosley 41-S by a committee of judges composed of H. H. Crites, General Manager of the Fokker Aircraft Corporation, Prof. D. C. Walker, Triadelphia District High School, and Peter Boyd, Governor of the National Association for West Virginia.

"Aviation," writes Mr. Fette, "is a business, and the public is grasping the fact more each day as the merits of aviation are pointed out to them as Ott-Heiskell Co. has done... Wheeling should be proud of a firm so interested in the progress of the city. Since I have been employed in the manufacture of airplanes and have taken up aeronautics with the hope of becoming a commercial pilot, I feel deeply interested in Wheeling securing an airport with government requirements."

A great deal of very good publicity was the result of the Ott-Heiskell contest.

Ott-Heiskell Secures Splendid Advertising Through Use of Windows in Vacant Stores for Crosley Display



THE OTT-HEISKELL COMPANY OF Wheeling, West Virginia, secured windows in a vacant store room located in one of the most prominent blocks in Wheeling. The windows have plenty of color in the trim and Ott-Heiskell reports favorable attention given to the display by passersby. It is their belief that it is the best kind of advertising that they have done in Wheeling.

Ott-Heiskell dealers tied-in with this ad-

vertising display by decorating their windows similarly with the result that the new models are selling much more strongly than competitive makes.

Ott-Heiskell intends to retain the window as long as possible changing the display from time to time with similar changes in dealer window displays. They contend that this advertising is superior to any other.

600 Dealers Attend Kierulff & Ravenscroft Meeting--Many New Franchises Issued

THE MOST SUCCESSFUL DEALER gathering in the history of Kierulff & Ravenscroft, Inc., California Crosley and Amrad distributors, occurred on July 19, 20 and 21.

It took the form of a three-day "Open House" preview showing the new Crosley and Amrad merchandise and was attended by over six hundred dealers. One San Diego dealer brought his entire sales and mechanical organization to the "open house" in three automobiles with Crosley banners attached.

Amrad's performance and beauty resulted in the signing of a large number of new franchises. One of the largest dealers in Southern California for a competing set requested a demonstration in his own store and, after making it, eliminated the competitor's merchandise, signed an Amrad franchise and declared:

"The Amrad demonstrated itself to be the greatest radio that has ever entered my store and I have had them all."

One feature of the "Open House" that attracted a great deal of attention was two display windows in size and shape corresponding with the average dealer window and trimmed with crepe paper.

The entire "open house" program was replete with merchandising suggestions and developed into a medium thru which closer friendships were established between distributor and dealer, and between dealer and dealer.

Motor Supply Holds Free Lottery of 41-S Receiver Delivered By Airplane

MOTOR SUPPLY COMPANY, CROSLEY dealer in Chattanooga, Tennessee, created a great deal of favorable publicity, by conducting a free lottery for the Crosley 41-S receiver which their plane took back to Chattanooga from Cincinnati in June. The Empire Furniture Company of Chattanooga co-operated with Motor Supply in newspaper advertising. On the eighteenth of June Empire Furniture Store had a wedding in their establishment and the same evening the winning number of the lottery was announced and the 41-S receiver given away. More than a thousand people attended the wedding, all of whom had not only the opportunity of seeing the set but hearing it.

When the set was received in Chattanooga, Motor Supply distributed by airplane ten thousand tickets over the city. The requirements were that the holder of the ticket sign his name, address, and number of the ticket at the Empire Furniture Store where the 41-S was displayed. Registration was required the night before the numbers were drawn. Lester C. Massey of Chattanooga holding ticket No. 7711 (three naturals, brothers!) won the 41-S receiver.

Motor Supply believes that a great deal of valuable publicity was received from this lottery feature.

These Merchandising Helps

Imitation Neon Signs

AFTER an intensive research of several months for the best possible electric sign this new imitation Neon sign was selected for display in your windows. The Crosley color scheme — black background, vivid red letters and yellow border is enclosed in a handsome imitation hammered silver frame. A distinctive and attractive sign that will pay for itself with the increased business that it attracts. Price, \$5.00, F. O. B. Chicago. Order from your distributor.



Large Sign—No. 29-10
Small Sign—No. 29-11

A smaller sign of the same design, appropriate for display on top of console or cabinet is available at \$2.50 F. O. B. Chicago. Order from your distributor.

PAPER MACHE

Put Human Interest



The Dancing Couple—No. 29-1

MAKE your windows attractive and interesting enough to bring people into your store. To help you do this the display department at the factory are working constantly. The four display figures pictured on this page are calculated to add that touch of human interest to your window which will take it out of



Getting A Few Pointers From the Big Leagues—No. 29-3

Will Boost Your Sales!

DISPLAYS

In Your Windows



The Old Lady—No. 29-2

the mediocre and give it novelty and distinction. These figures are life-like and are constructed of paper mache. They are hand-colored and are unusually attractive. Designed to attract the eye, they cannot fail to be a great source of interest. Get in touch with your distributor!



Baby Tunes In—No. 29-4

Beautiful NEON Signs for Your Window

THE famous Crosley name afire with flaming red of neon electric tubes! No one, passing your windows will ever forget that you are "Crosley Headquarters" in your community.



No. 29-12

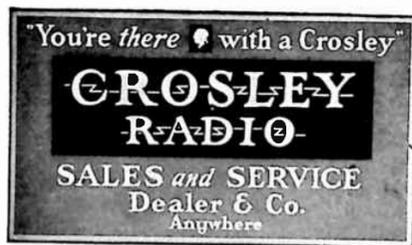
Portable neon electric (transformer inside) that may be instantly plugged into any regular 60 cycle electric light socket "Crosley" stands out in 3 in. red neon letters against a walnut-colored bakelite background, with raised border in most attractive old silver finish. This cabinet, 1 ft. 10 ins. long by 6 1/2 in. high and 5 in. thick, makes a most attractive and effective center of window or showroom display.

The letters on this sign are bent neon tubing.

Day and night this neon beauty will focus the attention of all passersby upon your store.

The Crosley Advertising Department, buying these attractive neon window displays at quantity prices, will ship to you for \$57.50, F. O. B. Buffalo. Send your order to your distributor enclosing check or to Flex-lume Corporation, Buffalo, N. Y.

Post the Roads That Lead to Town



Fibre Road Sign No. 28-3

A weather-proof fibre road sign, 18 x 30 inches, as shown above, printed in black, red and straw. Imprinted with your name and address. \$4.00 for fifty, including imprinting. Minimum quantity, fifty. Over fifty, 7 1/2 cents each, including imprint. F. O. B. Akron, Ohio. Order from your distributor, enclosing cash with order.

Hanging Sign

BEAUTIFUL hanging sign to identify your store as a Crosley Radio Shop in the dark as well as at noon-day. Unbreakable, transparent panels, sturdy metal construction throughout, completely wired for four electric lamps, overall size of sign, 23 by 34 inches. This sign is especially constructed to withstand weather and will hold its own against a whole blockfull of electric signs.



Hanging Sign, Illuminated No. 28-5

Price without bracket, \$10.50; complete with bracket, \$13.00. F. O. B. Cincinnati. Electric lamps not included. Order from your distributor, enclosing cash.

They Look Each Time They Pass

WE offer a giant thermometer, enclosed in a metal case, 19 inches in diameter. Because of its construction, this thermometer can be used on the sunny side of the street without showing temperature above the average. The thermometer is guaranteed by the manufacturers to be correct within two degrees. Finished in durable black enamel, the dial and advertising handsomely executed in black, red and buff. The face of the thermometer is protected by glass. Each thermometer is \$12.00. Order from your distributor, enclosing cash. F. O. B. Chicago.



Thermometer No. 28-4

Non-Electric Hanging Sign

A non-electric hanging sign, 18 by 27 inches, in three colors on both sides of heavy, 18-gauge metal. Weatherproof, durable and brilliant. Here is a sign that tells the world that within your door will be found an authorized Crosley dealer, ready for sales or service. This sign is so economical that every Crosley retailer should make use of it. Used inside the store in larger establishments it identifies the radio department to the hurried shopper. Each, \$2.50. F. O. B. Cincinnati. Order from your distributor, enclosing cash.



Hanging Sign No. 28-6

MAIN RADIO CO.

142 1/2 MAIN STREET
EAST ORANGE, N. J.
TELEPHONE ORANGE 573

TEN MILLION PEOPLE WHO NEVER HEARD OF BEEF STEW

In the south sea isles there are vast tribes that have never tasted cooked foods-- their experience has been limited to bananas and such --they have no palate for delicacies---

they don't know any better---



Just so-- there are people who believe a radio set has to be tinkered with, cajoled, coaxed and cussed out before it will give results. That has been their experience--but--



these folks have never known the luxury of an electric radio installed and serviced by the Main Radio Company.

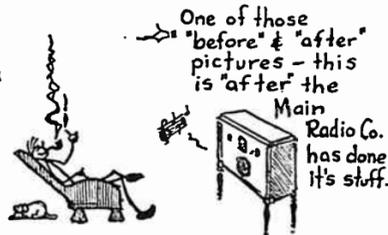
Press the button and listen-- forget all about mechanical and electrical details -- we take care of those.

Every one of our installations is supervised by a graduate electrical engineer-- a radio specialist-- he makes it his business to see that the set operates properly and that it continues to do so.

If you have intentions of buying a new set or you are having trouble with your present one-- give us a ring-- or better still-- drop in some evening and talk it over. It will

give us the greatest of pleasure to advise you on your radio problems.

Let's have a friendly chat some evening.



MAIN RADIO COMPANY.

P. S. We're not so sure about the South Sea Islanders and the beef stew -- you see, radios are really our specialty.

WE ARE PRODUCING HERE THIS MOST amusing and interesting letter. The idea is good and is well worked out. The line drawings, while perhaps lacking in technique, lack nothing in expression. The paper on which this letter was printed is of excellent quality; the type face in the letterhead, chaste and

well-chosen. This letter should produce results. A good deal of thought and time seems to have been spent in preparing it. Direct mail, when it takes the form of entertainment with a real hidden message, is one of the desirable forms of interest gaining advertising.

Lipkin Furniture Interesting Window



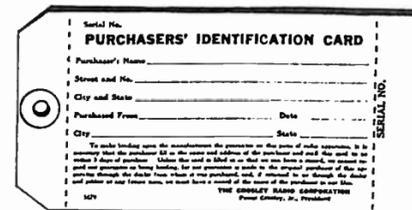
LIPKIN FURNITURE COMPANY OF Bethlehem, Pa., authorized Crosley dealer in that territory, conducts a chain of large furniture stores in the Wilkesing territory and is selling Crosley receivers exclusively. They claim extraordinary results from pursuit of this policy.

The display above is only a sample of the

many attractive windows that they have arranged since handing Crosley. The cutouts are of heavy cardboard finished in black and silver with paper tubing as a primary background. The black and silver composition of the display forms a rich and eye arresting background for the featured sets.

Good Says Crosley Must Be Good

PARKE H. GOOD, EMPLOYED AT THE Heener Mfg. Co., which produces the tag pictured above for Crosley receivers, recently wrote a most interesting letter about Crosley radio. Good is "there" with an 8 tube Crosley Showbox. He says:



"I am the man who runs the machine that makes these tags. I have run a lot of them this season. Something told me that the Crosley radio must be good because it takes so many tags.

"I caught the fever for a radio so I thought of Crosley first. I first tried the six tube set for about a week. It was installed by Strawbridge & Treadway. Their salesman asked me how I liked it, and I said that it was wonderful. 'Well,' he said, 'I want you to try the eight tube Crosley.' I did. I only had it in the house three hours until I bought it. I have heard a lot of radios but the Crosley is the best I have heard. I am certainly well pleased with it.

"I also enjoy the program from WLW. Please excuse this bum writing. I just wanted to let you know how pleased I was with the eight tube radio."

How To Locate Tube Sockets in Console Models

A. L. SAVITSKY OF THE PROVIDENCE Auto Supply Co., has employed a novel means of locating the tube sockets in Crosley console models where they are difficult to locate. By the use of a small mirror (an automobile rear-vision mirror would serve the purpose) placed inside right over the socket Savitsky was able to mark the position of the small and large holes. He contends that this lightens the burden of inserting tubes. This seems to have something of the periscope idea in it.

Chicago Dealer Displays Crosley Receivers in Model Rooms

MANY FURNITURE STORES CARRY radio in connection with other goods. Often these stores have beautiful model rooms which are visited by a large number of people. Despite this display opportunity, at least half of these stores seem to forget that a radio set could very well be brought up from the radio department and placed in one of the model rooms as a neat bit of suggestion selling.

Particularly does this apply to the colorful Crosley models that are used in John M. Smyth Company model rooms in Chicago. Women visiting the Smyth rooms where Crosley radios are displayed along with the furniture insist on these sets even in preference to a much higher priced receiver that they could afford, due to the pleasing effect that is secured when the Crosley set is properly placed in the proper atmosphere.

Crosley Wins In Dealer Selection

E. E. ANDREWS, MANAGER OF JIM ANDREWS, Jr., dealer in Columbia, Tenn., decided to sell radio along with his other stock. He decided to pick the best in the field. Let him tell in his own words of his decision. He writes:

"Some time ago we decided to add to our business a radio department. With this in view we wanted to pick the best in the field, as it has always been our policy to sell only quality merchandise. To become 'sold' ourselves, we had several makes of radio sent to us. Then we set to work to eliminate those that did not come up to our standards. Your representative called to see us a few days ago, and we signed an application for a local dealership. Two sets came in soon afterward, and we again did some eliminating. The result has been that CROSLLEY has eclipsed beyond all comparison the best sets which we had. It has outperformed one set which costs very much more. We are now more anxious than ever to push CROSLLEY, and would like to hear from you as soon as possible."

This is an excellent recommendation from a man who must sell merchandise.

Series of Meetings Held By Wisconsin Distributor

W. A. ROOSEVELT COMPANY, CROSLLEY distributor in LaCrosse, Wisconsin, has just completed a series of dealer meetings. These were held in Sparta, Wis., at the Hotel Sidney; at Eau Claire, Wis., at the Hotel Eau Claire; and in Rochester, Minn., at the Hotel Arthur.

This is the first attempt of W. A. Roosevelt to take their meetings to the dealer. In previous years one large central meeting only was held. W. A. Roosevelt Company has found that the series of meetings brings out more dealers and is more successful than the large central meeting had been and they contemplate continuing the series in the future.

Sixty-six dealers were entertained at the three meetings. According to W. A. Roosevelt representatives a larger number of dealers was contacted than could have been reached had only one central meeting been convened. Each meeting began at 2 p. m., continued through the afternoon and closed with a dinner for all those in attendance. A full display of Crosley and Amrad receivers was made at each meeting.

H. F. Jaax, Crosley representative, C. G. Smith, Amrad representative, C. G. Van Loan, Manager of the Roosevelt Service Department, and Jack Brindley, Manager of the Roosevelt Radio Department, attended each meeting and discussed with the dealers Crosley and Amrad products, plans, and advertising campaigns. All subjects, interesting to dealers, were discussed. Broader subjects, radio developments and radio in general were touched on by the distributor and factory representatives.

The lines were received by the Dealers with considerable interest, and substantial orders attested the popularity of Crosley and Amrad in the dealer minds.

Virginia Fan Boosts Crosley Performance

Roanoke, Va.
July 15, 1929.

The Crosley Radio Corp., Cincinnati, Ohio. Gentlemen:

Just a word to advise you as to how we like the Crosley Showbox and the Crosley Dynamone Type F. It is on from seven in the morning until ten-thirty and twelve o'clock every night. When I read your ads in the many papers and magazines I had some doubt as to whether it would prove to be as good as expected, as I naturally was looking for something out of the ordinary.

I must say that you have a wonderful machine. Its value can be appreciated only by demonstration. I certainly am pleased with my Showbox in every way. It is a very sharp tuning set and the music comes over as clear as if I was sitting in the same room with the performers. Everyone tells me that it is a very smooth and beautiful set.

My friends all advised me not to take a chance in doing business with a concern so far away. But I believe in taking a chance once in a while for now I have the laugh on my friends. I can say with pride that the outfit I purchased some time ago is the best bargain in radios and has the best sounding set of any that I have ever heard. I have had the Pacific Coast many times. I am getting stations at all points. I have had stations from every part of the country and Canada and C. M. C. Havana, Cuba.

Several people who have other makes of higher prices have heard my radio have said it was the best they have ever heard. I am fully satisfied with my Showbox. You have the best broadcasting station in the United States. Please tell Robert Brown he is the best announcer also.

I will be on the air Saturday at seven o'clock P. M.

Yours very truly,
G. W. GRAY.

Effective Icyball Letter

RALPH L. WADE, AUTHORIZED CROSLLEY Radio and Icyball dealer in Framingham, Mass., issued a simple but effective form letter with Icyball circular attached. The letter is arranged in the form given below and tends to lead the recipient to read it by its very arrangement.

PROTECT YOUR HEALTH
WITH A

CROSLLEY ICYBALL

Have an iceless ice chest
Cost you 2c a day to operate
Read the enclosed circular
Come in and see the refrigerator
Making the cubes of ice and
We will be glad to tell
You all about them
Price \$85
Cash or
Terms.

The best time to start your next sale is right after you close your last.

Crosley Builds Big Business FOR CALIFORNIA DEALER



SPANISH ARCHITECTURE IS DOMINANT in this beautiful interior of the Robinson Radio Company store in Los Angeles. This beautiful shop is owned by M. Robinson, and managed by W. E. Morrow. The Robinson Radio Company has made decided strides in its few short years of business. Two years ago the company started in a store room, with nothing but the store room, good will, and the Crosley line. In this short time, they developed this beautiful shop, the best in the southwest section of Los Angeles, together with a volume of business that is envied by many stores older and larger.

An interesting feature of the shop are the meters built in the arch to the right of the Crosley sign in the picture. These are visible tube tester meters, and a customer can see the readings as his tubes are being tested. The idea of building the meters into the arch is very good.

The Spanish arches add very much to the display of the sets, and aid in demonstrating the different styles. Mr. Morrow states that Crosley 32 is always in the center of the floor, and is the set that gets the prospects and the customers.

The Crosley Radio Corporation is proud of its part in helping Robinson to a merited success.

TAYLOR ELECTRIC CO.
MADISON, WIS.

Exclusive Radio
Wholesale Only

CROSLLEY DISTRIBUTOR

SCHUSTER ELECTRIC
COMPANY

WHOLESALE

CROSLLEY DISTRIBUTOR

2169 Spring Grove Avenue
412 Elm Street, Cincinnati, Ohio
West 141-Phones—Main 820

Crosley Icyball in the Belgian Congo

MRS. RUSSELL J. DAVIS WRITES US this interesting account of the Crosley Icyball Refrigerator from Mt. Pleasant, Texas:

"Seeing your ad for Icyball Refrigerator in the Holland Magazine for July, I thought you would be interested in knowing that one of your Icyball Refrigerators is doing good service in the heart of Africa.

It is being used by Mr. L. G. Deland Leube, A. P. C. M., Congo Belge, Africa. He took it with him when he sailed from America in August, 1928.

They are not near an electric plant, and the temperature, as I understand it, rarely if ever goes below 60 degrees. You can see, therefore, what a comfort the Icyball has proved to them in preserving any fresh meat or other food they are fortunate enough to secure.

To the natives the ice is a marvel. One man carried a piece home to show his wife and could not understand why, when he had reached his hut, he found he was carrying only water."

Contest Winner Lauds Crosley

Mr. FRED CORK, WHO WON A CROSLLEY Gembox in the international contest when the new WLW first went on the air is getting a great deal of satisfaction from his prize. He recently picked up Holland relayed through KDKA and we are reproducing his letter here:

"I am proud of my Gembox (which I received through the medium of your recent contest) and it's a star performer up North here. The other evening KDKA put on the air a station in Holland and the Gembox did the rest.

"You will find a copy of memo I've mailed to our Dutch Friends and on receipt of their reply I'll send you the original for perusal. Maybe I'm stealing KDKA's "thunder" but what is that compared with my Gembox "Chain Lighting" reception?

"And anyway Holland might as well be "Enlightened" now as later on . . . even though they make famous cheese and electric lamps in Eindhoven."

Mr. Cork's letter to Holland is reproduced below:

Messrs. Phillips Gleoilampen Fabrik Eindhoven, Holland,

Gentlemen:

"Your program re-broadcast through KDKA the other evening was picked up here by me. My receiving set is a Crosley electric Gembox, 6 tube receiver, and your signals came in strong and clear, at all times.

Please convey my regards to your announcer and tell him the only "Dutch" I understood during his short talk was "America".

"Best wishes to you all, and "call" again.

The estimated market for battery sets in rural communities is 9,000,000. The Bandbox, one of the most popular sets in the Crosley 1928 line, is now available for only \$20.00! The Bandbox is a logical set for this great farmer market.

CROSLLEY DEALERS' ADVANCED RADIO COURSE

This is the third 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 III.

RADIO TUBES AS DETECTORS

The purpose of the detector, as was described briefly in the preceding lesson, is to separate the audio-frequency component from the radio-frequency component of the incoming signal.

The Incoming Signal

As received in the antenna circuit, the signal consists of a radio-frequency current modulated, or controlled in strength, at audio-frequencies. It is the audio-frequency modulation, or audio-frequency component of the incoming signal that represents the program at the studios. This is the portion of the signal to which the loudspeaker must respond.

If the modulated, radio-frequency current were fed directly into the loudspeaker, no sound reproduction would result. In the first place the impedance of the speaker at the radio-frequencies in question would be such as to effectively block the currents. In the second place, the hysteresis losses at such high frequencies would be extremely large. In the third place, even if the other two difficulties did not exist, the speaker diaphragm, no matter how light it might be made, would have too much inertia to follow the very rapid fluctuations of the radio-frequency signal.

In order for the loudspeaker to reproduce the sounds of the program it is necessary to blot out the radio-frequency oscillations and retain only the audio-frequency component, for delivery to the speaker. This may be done by rectifying the radio-frequency signal (that is, by changing it into a uni-directional, instead of an alternating current) and by smoothing out the resulting uni-directional pulsations with suitable chokes, so that what remains is a continuous current, changing in strength in accordance with the audio-frequency component of the signal.

Crystal Rectifiers

For rectifying the signal, any of a number of devices may be used. These allow current to flow through them in but one direction, or conduct electricity much better in one direction than in the opposite direction. For example, selected crystals of certain materials, such as galena, silicon, carborundum, etc., have much greater electrical conductivity in certain directions than in other directions. If such a crystal is connected properly in an alternating current circuit, one half of the alternations will flow through the crystal with ease, while the other half of the alternations (flowing in the opposite direction) will be almost entirely blocked. The result will be that half of the alternations will be practically blotted out, the remaining half consisting of pulsations of current all in one direction.

If these uni-directional current pulsations from the crystal rectifier are sent through a choke coil of suitable value, shunted by a condenser, the current through the choke coil will be practically continuous, for the impedance of the choke will oppose the pulsations of current and tend to smooth them out into a practically continuous flow.

Now let us see what happens when a radio signal passes through such a system. The radio signal consists of a high-frequency alternating current, varying in strength at audio frequencies. When this signal passes through the crystal rectifier, half of the radio-frequency alternations will be blotted out, leaving uni-directional pulsations varying in strength at audio frequencies. If these radio-frequency pulsations are sent through an inductance and shunt condenser of proper value, the inductance will blot out the radio-frequency pulsations, smoothing them out into a practically continuous current varying in strength at audio-frequencies.

Other Detectors

In earlier receivers using crystal detectors headphones were used as the means of reproducing the sound. The inductance of the headphones was sufficient to smooth out the rectified radio-frequency pulsations. A condenser known as the "phone condenser" was shunted across the headphones to by pass such radio-frequency pulsations as were not "ironed out" by the inductance of the phones. In modern receivers, the detector usually feeds into a coupling transformer or coupling choke, which smooths out the radio-frequency

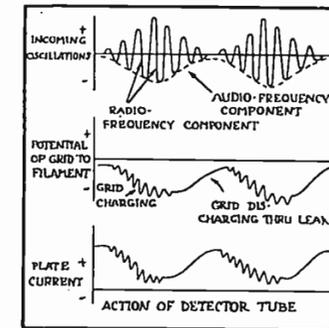


FIGURE 1.

Action of Grid Condenser and Grid Leak

pulsations, or else there is sufficient inductance in the coupling transformers or chokes of succeeding stages or in the loudspeaker itself to accomplish this purpose.

Many kinds of detectors have been employed, including the electrolytic type, consisting of a fine platinum wire barely dipping into an electrolyte, the two electrode rectifying vacuum tube, the three electrode vacuum tube, etc. The three-electrode vacuum tube, however, has such advantages as a means of detection that it has come into practically universal use in broadcast receivers. The three-electrode tube amplifies at the same time that it rectifies. It is, when properly adjusted, fairly free from distortion. At the same time, it will operate continuously without adjustment.

There are two methods of employing three-electrode radio tubes as detectors. In one of these the rectification is due to curvature of the grid-voltage grid-current characteristic curve. This is known as the "grid rectification",

or "grid-condenser grid-leak", method. In the other, rectification is due to curvature of the grid-voltage plate-current characteristic curve. This is known as the "plate rectification" or "C bias" method.

Grid Rectification

In the grid rectification method of detection, a small condenser shunted by a high resistance is inserted in the grid circuit of the detector tube, between the secondary of the input transformer and the grid of the tube. This condenser is known as the "grid condenser" and the high resistance as the "grid leak."

A simple explanation of the action of a grid-condenser grid-leak detector is as follows: Suppose the detector circuit contains a grid condenser only, without a leak. If no signal is being received, some electrons will strike the grid, causing a negative charge to pile up on it and on the condenser plate to which it is connected. Eventually this increased negative charge on the grid will be sufficient to prevent further electrons from striking the grid, and the equilibrium potential thus established on the grid will be maintained until other changes are introduced in the circuit.

Now suppose an alternating current, as for instance an unmodulated signal, is impressed on the grid circuit. This current will swing the grid alternately more positive and more negative than the mean value which it had acquired with no signal. During the cycles in which the grid becomes more negative, the signal will have no effect, but during the cycles in which the grid becomes more positive, more electrons will be attracted to the grid and a further negative charge will pile up on the grid and grid condenser. This increase in negative charge of the grid will continue until an equilibrium condition is again reached, in which the grid potential is so negative that the signal cannot swing it positive enough to pick up electrons.

Thus, the net result of applying an alternating current to the grid circuit will be to make the grid more negative. This will result in a decrease of the plate current. Whenever an alternating current, such as a signal, is impressed on the grid circuit the plate current will, then, be decreased.

If only a condenser were placed in the grid circuit, the decrease in plate current would be permanent, continuing even after the applied alternating current ceased (barring, of course, leakage of charge from the condenser plates). If, however, the grid condenser is shunted by a high resistance leak, the charge will be allowed to leak off from the condenser and grid as soon as the signal ceases to be applied to the grid.

With the proper value of leak, then, every increase in strength of the incoming signal will be accompanied by an increased negative charge on the grid resulting in decreased plate current; and every decrease in signal strength will be accompanied by a leakage of excess charge through the resistance from the charge on the grid, resulting in decreased increases in signal strength will result in de-

creases of plate current, and vice-versa. Since it is the changes in strength of the signal that represent the audio-frequency modulations of the radio program, these audio-frequency currents will, therefore, be reproduced as changes in the plate current.

Characteristic Curve Explanation

A somewhat different explanation not quite so simple illustrates how it is the shape of the grid-voltage grid-current characteristic curve that accounts for the rectification by this method.

Consider a detector circuit incorporating a

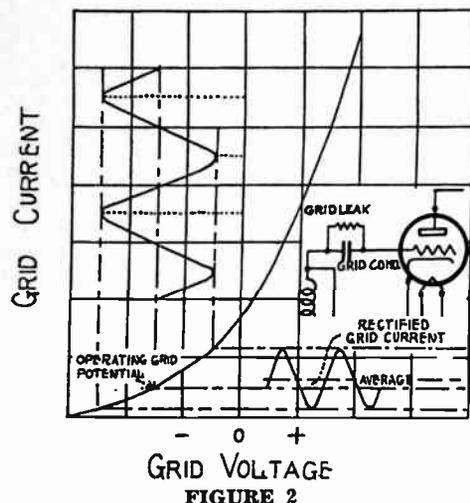


FIGURE 2
Characteristic Curve Showing Action of "Grid Rectification"

grid condenser and grid leak. If no signal is being received, there will be a small current continuously flowing through the grid-leak resistance, because of electrons which strike the grid and tend to pile up a negative charge on it. This current flowing through the resistance will cause an appreciable voltage drop in the resistance, making the grid somewhat negative with respect to its point of connection to the filament.

Now suppose an alternating current is applied to the grid circuit. The grid condenser, shunted across the resistance, offers a good, low-impedance path for this high-frequency alternating current, so that it is not necessary for it to flow through the leak resistance. Due to the alternations of current the grid will be swung alternately more positive and more negative than its mean potential when no outside current is applied. When the grid is swung more positive the grid current will be increased, increasing the voltage drop through the leak resistance and tending to make the grid more negative. When the grid is swung more negative, the grid current will be decreased, reducing the voltage drop through the resistance and tending to make the grid less negative. Thus the changes in grid current flowing through the resistance when an alternating current is applied to the grid circuit will tend to oppose the changes of grid potential due to the signal itself.

From an examination of the curve shown in figure 2 it is apparent that a decrease in grid potential from the mean value has much less effect than an increase in plate potential. Thus, when the grid is swung more positive by the signal the increase in grid current will be much greater than the corresponding decrease in grid current when the grid is made more negative. The result is that the changes in the grid current flowing through the resistance will oppose the action of the signal in making the grid more positive much more than they will oppose the action of the signal in making the grid more negative.

When a signal is applied to the grid circuit, the effect will be to make the mean value of the grid potential more negative, and the greater the strength of the signal the greater will be this change of mean grid potential toward more negative values. As the mean grid potential becomes more negative the mean plate current will decrease, so that changes in signal strength will be reproduced in the plate circuit as changes in the plate current.

Plate Rectification

In plate rectification, no grid condenser or grid leak is used but the grid of the tube is maintained at a negative potential with regard to the filament by means of a battery or the voltage drop in resistance. The rectifying action of this type of detector depends upon the curvature of the grid-potential plate-current characteristic curve.

By reference to the curve in figure 3 it will be seen that if the grid potential is adjusted to correspond to the lower bend on the curve, an increase in grid potential will cause a much greater increase change in plate current than a corresponding decrease in grid potential. If, under these conditions, an alternating current is applied to the grid, the negative halves of the alternations will have much less effect on the plate current than the positive halves. Consequently the net effect of the applied signal will be to increase the mean plate current. The stronger the signal, within limits, the greater this increase in plate current will be. If a modulated signal, varying in strength, is applied to the grid, the plate current will increase as the signal grows stronger and decrease as the signal grows weaker, reproducing the audio-frequency modulations, or fluctuations in strength, in the plate circuit.

From an examination of the curves it is apparent that neither grid rectification or plate rectification are methods of perfect rectification. Both depend upon the fact that a characteristic curve of changing slope gives greater changes for signal alternations in one direction than for signal alternations in the other direction.

If the signal is very weak, so that only a very small portion of the curve is worked on, the changes in slope of the curve within this range will be too small to produce much unequal effect for rectifying the signal. Thus if the signal is extremely weak good rectifica-

tion will not be obtained. That is one reason why it is customary in modern receivers to use several stages of radio-frequency amplification before the detector, so that the signal is of considerable strength when it is applied to the detector tube.

If the signal is too strong considerable distortion may occur unless the tube is of the proper kind to handle strong signals. Under certain conditions, stronger signal may be handled by plate rectification than by grid rectification. Detectors designed for delivering powerful rectified signals are sometimes referred to as "power detectors."

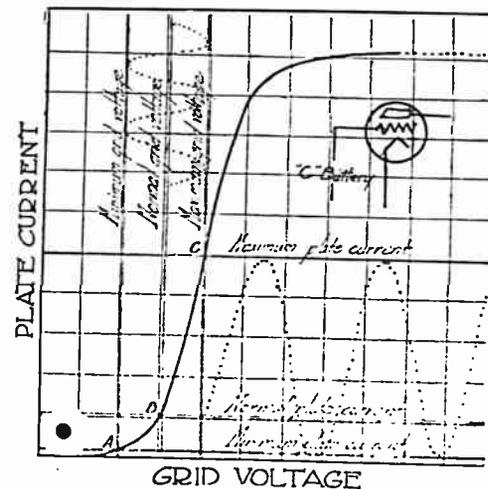


FIGURE 3
Characteristic Curve Showing Action of "Plate Rectification"

In designing a radio receiver, the choice between grid rectification or plate rectification depends upon a number of factors, too involved to be discussed here. The careful manufacturer chooses the method he finds best for each particular receiver.

QUESTIONS

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

1. How would you determine the best grid leak to use with a grid condenser detector?
2. Why are "C" bias detectors worked at the negative knee of the grid-voltage plate-current characteristic curve instead of at the positive knee of the curve?
3. Do modern, light-socket receivers using "C" bias detectors employ the voltage drops in resistances for obtaining the "C" bias?
4. What is the effect of the curvature of the plate-current grid-voltage characteristic curve on the rectification of a grid-condenser, grid-leak detector?
5. What would be the effect of using too high a resistance for a grid leak?