Production-Engineering-Distribution • Radio-Television-Sound Projection

RADIO Industries

With which is incorporated Radio Manufacturers' Monthly

NOVEMBER · 1929

Radio and the Stock Market

•

Recruiting Radio's Retailers

•

What About Remote Control?

•

Extending the Horizon of Radio

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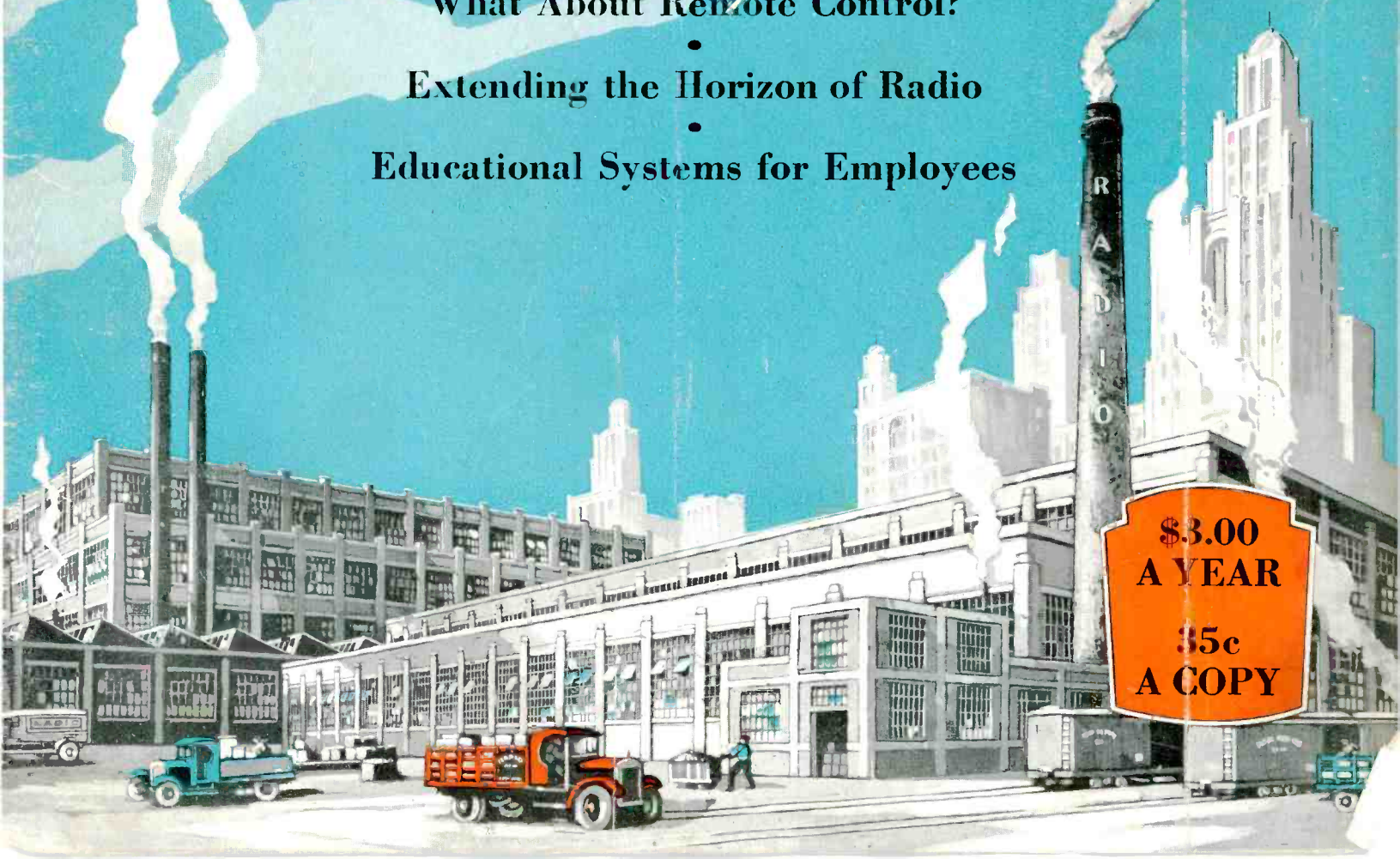
Educational Systems for Employees



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FORT WAYNE, INDIANA
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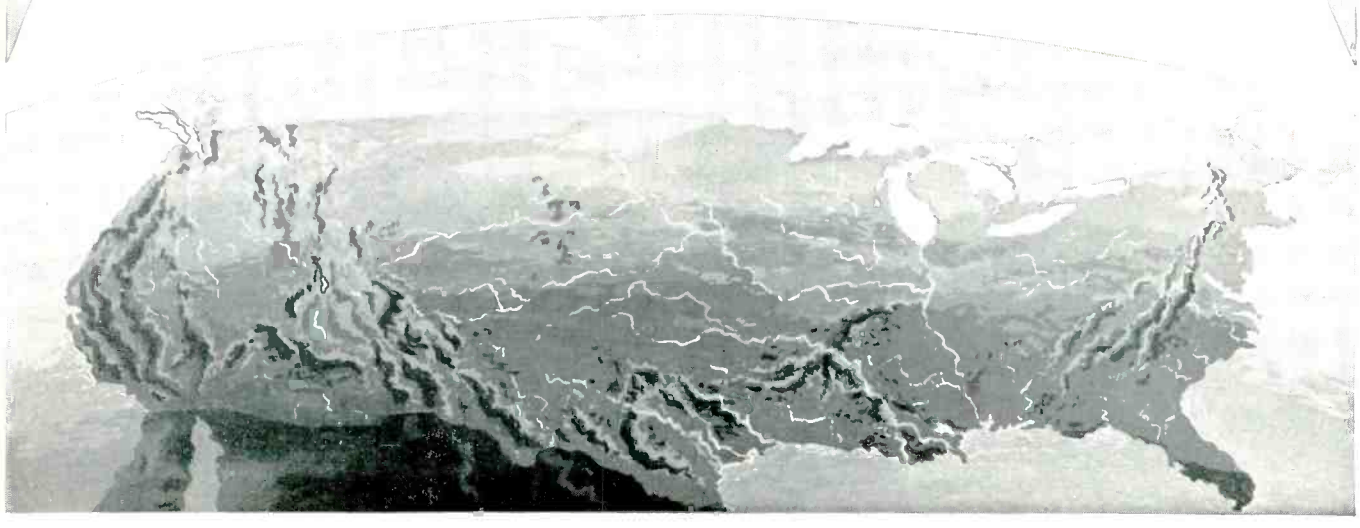

The *Wonder Plant* of the Radio Speaker Industry

VISITORS at the mammoth speaker plant of Valley Appliances, Inc., at Rochester, New York, marvel first at its size, then at its completeness, finally at the precision of its product, the Symington Reproducer.

In this plant, Valley Appliances, Inc. utilizes over $1,000,000 in plant and equipment for the production of Symington Reproducers. $348,000 of modern labor-saving machinery has been added in the last three years.

We have just published a pictorial folder showing the big Valley Plant at work. It shows our large-scale One-Profit plant from Laboratory to Loading Platform. Executives and Engineers are invited to send for a copy.

No charge or obligation.

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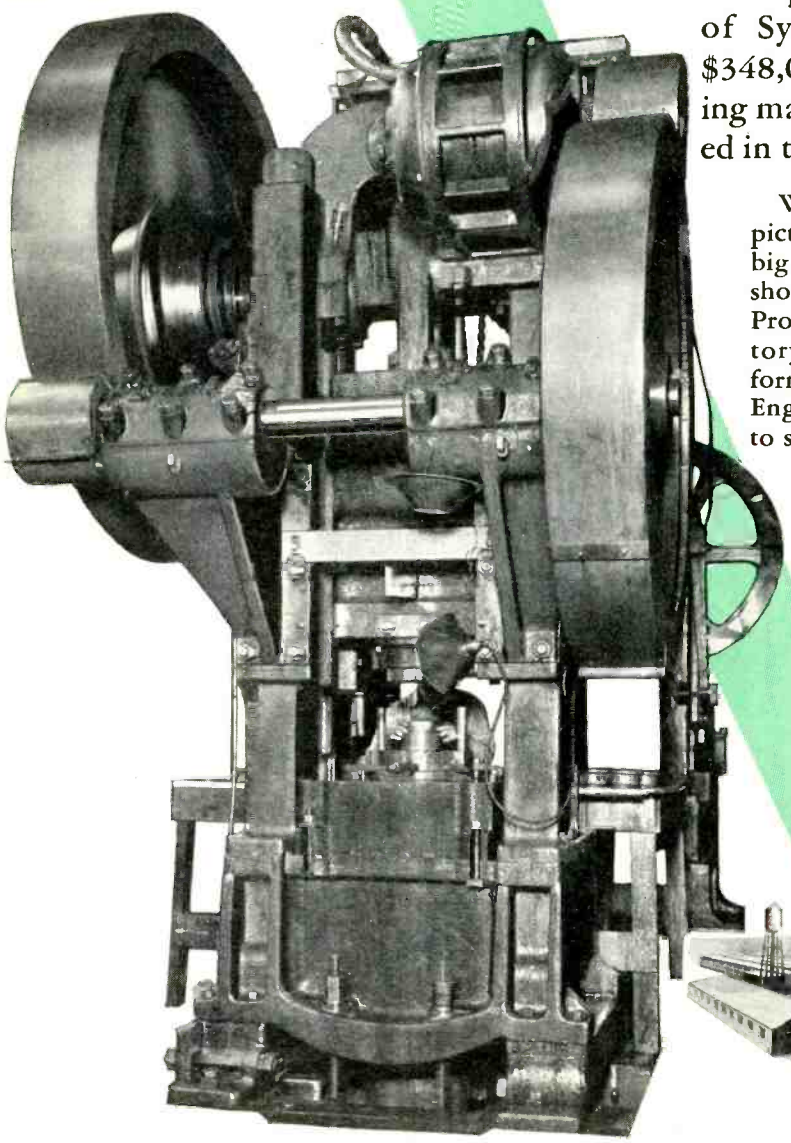

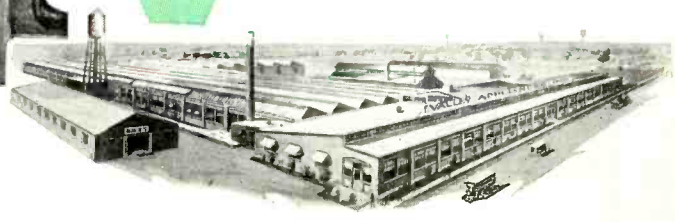

VALLEY APPLIANCES, INC.

Makers of the Symington Reproducer

ROCHESTER, N. Y.

Published every month by Radio Industries Corporation at 625 Madison Avenue, Evanston, Ill. General Offices, McGraw-Hill Bldg., Chicago, Ill. Subscription price $3.00 per year in advance. Entered as second class matter August 24, 1928 at the post office at Evanston, Ill. under the act of March 3, 1879. Vol. 4, No. 7.

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True tone, of course, depends upon transformers—and the only way to be sure of the tone quality is to be sure of the transformers you use. All transformers look pretty much alike, but builders and manufacturers know that performance tells another story.

There is something more to a good transformer than windings, a core and a coat of enamel. Transformer building is a science and only specialists of wide experience should attempt it.

Sangamo — with 30 years' experience in manufacturing electrical precision instruments, has unsurpassed facilities for producing audio frequency transformers that are a guaranty of the most satisfactory amplification over the entire musical frequency scale.

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SPRINGFIELD, ILLINOIS, U. S. A.

Sangamo Electric Co. of Canada, Ltd., 183 George St., Toronto

For 30 years preeminent manufacturers of electrical precision instruments

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"The standard line of Sangamo Fixed Condensers leaves the factory tested to maximum variation of 10%!"

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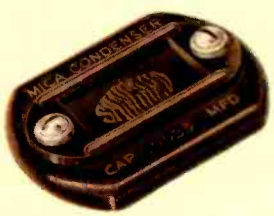
Every sound characteristic is affected by the quality of the fixed condensers in a set. Sangamo builds accurate mica condensers, molded within an overall enclosure of genuine bakelite with only the terminals brought outside. Moisture, heat, shocks or jars will not alter their characteristics nor affect operation after the set leaves the factory.



Sangamo Type "A" Condenser—solidly molded in bakelite and immune to thermal or atmospheric changes.

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This new condenser is of the same quality as the standard Sangamo Fixed Condenser—but is of a size and shape that more readily adapts itself to factory production. The greater convenience of connecting lugs which may be bent to any position without danger to the condenser can readily be appreciated.

The new Sangamo "Illini" Condenser—for manufacturers' use only.

All prices on request

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- ☐ (*For manufacturers*) Please send engineering data on your transformers and condensers.
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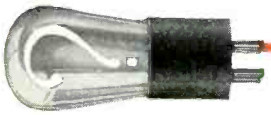

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Published by
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Chester A. Darling
President
Thomas Liddell
Vice-President
Hugh C. Frisbee,
Secretary-Treasurer

RADIO Industries

With which is incorporated Radio Manufacturers' Monthly

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RADIO
TELEVISION
SOUND PROJECTION

VOLUME IV. NUMBER 7

Contents

NOVEMBER, 1929

RADIO INDUSTRIES
520 North Michigan Ave.
CHICAGO, ILL.
PHONE WHITEHALL 4840

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RADIO INDUSTRIES is published monthly by Radio Industries Corporation, 625 Madison Ave., Evanston, Ill. Editorial and General Offices at McGraw-Hill Bldg., Chicago, Ill.

Entered as second class matter August 24, 1928 at the Post Office at Evanston, Illinois, under the act of March 3, 1879.

ISSUED MONTHLY, 35c the copy, $3.00 a year in the United States, it's possessions and Canada. Other countries $4.00 a year.
Forms for December issue close November 20th.

CHANGE OF ADDRESS. Instructions for change of address should be sent to the publisher at least two weeks before the date of effect.

MONTHLY CHATS

The Chicago Better Business Bureau, in its weekly report recently, cited a case wherein a very well known radio set was advertised by a certain Chicago Piano company at a greatly reduced price and at a $5.00 down payment. Upon making inquiry, the Bureau shopper was informed that the model was a discontinued one. Asking to see it, the shopper was shown a cabinet in which, the salesperson said, the popular set was placed.

No demonstration was given as the cabinet contained no chassis. The salesperson said "This is the set we make ourselves and the one you ought to buy." A thorough demonstration of this set followed. The salesperson failing to make the sale turned the shopper over to another salesman, who again went through a demonstration of the same set, with no consideration for the nationally advertised set whatever.

This same store has been visited and censured by the Bureau on a number of occasions but the deception to the public continues. Sooner or later this condition will vanish very largely but not until manufacturers and distributors cooperate to the fullest by placing only legitimate retail outlets and through a process of vigilance on the part of the trade associations.

* *

To anticipate the problems of the Radio Industry and to assist in their solution has been the policy of this publication since its first issue in May, 1926.

Since that early date, the changes in the industry have been many. We have been told that our editorial efforts and policy have helped greatly in standardization and other improved conditions.

With RADIO INDUSTRIES, we will carry on as before, incorporating editorially the various, new divisions of the Industry which scientific development have made possible. Full steam ahead!

A NEW INDUSTRY BY PIONEERS IN THE FIELD

Founded by GEO. A. JACOBS *and Associates*

THE Inca Manufacturing Corporation brings to the radio, electrical and automotive industries a new and dependable source of supply of the finer sizes of enameled insulated wire and windings. The completion of a large manufacturing plant with superb production and engineering facilities, places Inca in a position to meet your most exacting demands. Launched with sails set full for excellence of products and courtesy of service, we invite your ever increasing patronage and good will.

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EDITORIALS

Over-production has produced one outstanding effect in the radio industry this season, and that is the reversal of the dictatorial position. In previous years, the manufacturer has done all the dictating of sales and merchandising policies, selling to whom he liked and at the prices and terms he liked. This year, with more sets to be sold than the jobbing and retailing trade can comfortably accommodate, the jobber is going to pick from among the manufacturers, and the dealer, in turn, is doing choice picking from among the jobbers. Incidentally, these gentlemen are also stating their own terms in no uncertain language, for they are sitting on the throne. Among other things, both jobbers and dealers are insisting on exclusive territories and getting them. In our survey about the country we see more and more exclusive territories, with jobber and dealer pushing exclusive lines much harder than ever before. There is real merchandising being done, so what might seem at first as the manufacturer's hard luck, may turn out, after all, to be the silver lining of an otherwise dark cloud.

THE MERCHANDISER GETS HIS WAY

We were discussing the radio business with a leading cabinet manufacturer recently. Said the cabinet manufacturer: "We can use a dozen different makes in our cabinets, according to how much we want for the finished job. Of course, you understand that with the complete, self-contained set, which is practically standard practice today, we have either got to sell cabinets directly to set manufacturers, or else go in the radio business ourselves. It seems that radio has become our main business, and like the rest, we cannot get away from it now. So, if we don't get the business from set manufacturers, we make up and sell our own sets. Well, there are sufficient chassis to go round, so we have been making up our own sets. The only trouble is getting some big name to tie on our sets. If we could only find a big name, well——"

STANDARDIZATION PLUS

Well, that is the story. Standardization plus. All alike. No talking points to out-match the other fellow, unless it be price.

Standardization is an excellent thing. We have been advocating it for years. It would seem, however, that a little original effort might go pretty far in promoting the game of some manufacturers. It would at least relieve the industry from much of the terrible price slashing now going on. It would be nice, for a change, to see a bit of ingenuity and novelty, while still holding on to our standardization which has meant so much by way of stabilization.

Many sets are still supplied with tubes by the manufacturers, as a hang-over from the days of the Clause 9 enforcement. Is this good practice? Or is it bad practice?

WITH OR WITHOUT TUBES?

The final criterion is the public, and the next best, which is easier to reach for securing an opinion, is the retailer. We have asked dealers what they think of this practice, for there has been much howling about the autocratic methods of set manufacturers forcing certain makes of tubes on the jobber and dealer. Much to our surprise, most dealers and jobbers prefer to have sets with tubes. In the first place, they state, it assures tubes for every set bought, which is an important consideration when we recall the seasons when tubes were lacking and sets remained unsold. Then there is the guarantee of good tubes, for the set manufacturer must stand back of the tubes. Still again, there is assurance of having tubes match the set, for the set manufacturer has no alibi when his set will not work with the tubes he has himself selected and supplied. Lastly, the dealer and jobber pay for the tubes supplied, and it's six in one hand and half dozen in the other as to where they buy tubes, everything else being equal.

And so the practice seems to be growing in favor. The Clause 9 agitation, once subjected to so much harsh criticisms and threats and legal actions, is now being hailed in many quarters as a mighty fine practice. What a strange business!

It seems as though there were considerable doubt about the screen-grid tube. Many radio manufacturers are still turning out the non-screen-grid type sets and selling lots of them. And that was to be expected.

THE SCREEN-GRID QUESTION

The screen-grid tube came along a bit too fast. It is a hard tube to make. It is a costly tube to make. The rejections run high—80% is by no means unusual in a good tube plant. And so many questionable screen-grid tubes are being permitted to reach the market, which in turn react on the efficiency of the screen-grid sets. Also many scree-grid tubes fail to have the necessary high mutual conductance to make for the promised efficiency. As a consequence, the screen-grid circuits often perform little better than the ordinary 227 tube circuits—with a lot of doubt thrown in for good measure.

Let's go easy on the screen-grid circuit. Theoretically, it is a wonderful thing. Practically, it is questionable. And if we must sell screen-grid sets, let's be sure that our vacuum tube confreres give us good tubes so as to make good on our sets.

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Extending the Horizon of Radio

Some Food for Thought by Way of New Merchandising Ideas That May Keep Our Factories Operating at Full Speed Ahead

By C. A. DARLING
Editor

LET'S face the facts! There is a serious over-production of radio sets this season, with the result that we have got to do some mighty hard merchandising. Some lines are already selling very slowly, even though the good radio season has only begun. Other lines are selling fairly well, due to having caught the fancy of the fickle public. Obviously, our industry is now geared to produce far more radio sets than can be sold. Either we must curtail our production, which means back-sliding and perhaps being counted out altogether in due course, or else we must find a way of extending our activities so as to get away from over-production in radio sets alone. In any event, something must be done —and done mighty soon—if we are to swing that old economic law of supply and demand right side to, once more in our favor. And so the following rambling thoughts on the subject, but as a matter of stimulating the ideas of others than to take all the credit for doing the job single-handed.

First of all, there is evidence of some of the bright minds of the radio industry seeking other fields of endeavor, so as not to concentrate vast production facilities on radio sets exclusively, with the inevitable over-production result. Thus there are set manufacturers now investigating the possibilities of electric and gas refrigeration, oil burners, electric phonographs, home talking pictures, radio musical instruments, public address systems, radio wiring systems, and so on. All of which is a good thing and a step in the right direction, for it becomes increasingly evident that the demand for new radio sets cannot support the host of large and small manufacturers, working like beavers, each attempting to see just how many sets can be turned out in a given year, without thought to how much the market can comfortably absorb—at the list price, which means at a profit.

Of course, the starting point of the campaign against over-production of radio products is a frank understanding between radio manufacturers—not an illegal combine, please understand, in restraint of trade, but a get-together for the purpose of discussing the extent of the market and how it can best be supplied. Any competent lawyer can guide a group of radio manufacturers so that they may remain well within the letter of the law, yet avoid the present danger of becoming bankrupt through over-production, ridiculous marketing methods, and general dumping long before the season is over.

To our way of thinking, we believe that the radio trade associations have a job to do by way of campaigning against over-production and starvation prices. The radio trade associations should make it their business to study the radio market. They should know precisely the radio market just as thoroughly as it is possible through careful analysis, survey, and the compilation of a vast array of sales figures. The radio trade associations should estimate the probable market for radio sets at the beginning of each season, determine the most logical distribution of sets, suggest the type of sets to make, and then see that the members of the association more or less agree within safe and sane bounds so as to avoid over-production. The radio trade associations should foster diversification of production, as a further means of assuring a fair return to each and every radio manufacturer on the basis of his production facilities and investment. To our way of looking at things, the radio trade associations for the most part have never gone very far out of their way in order to help radio manufacturers improve their marketing conditions. Rather, the manufacturers have been left to fight it out in a sort of a free-

THE scope of the radio industry is fast expanding. This article deals with some of the existing by-fields of radio and answers the problem of many manufacturers. *Radio Industries* senses the vast future possibilities of the expanding industry and with this issue announces its recognition of and future plans for embracing the various divisions which belong to the radio industry.

for-all fight, with the result that they have done so with many sad results.

Perhaps a parable is in order. If so, let us recall the story of the hunters who were having a hot argument as to how the bear's skin would be divided. Finally, with the argument still unsettled, someone suggested that the bear should be sought and killed, while there was still sufficient energy left among the hunters to do so. Whereupon the entire argument collapsed, for no one cared to go out and fetch the bear.

In our present radio setup, it is much the same story. We have our arguments about markets; we hear many bold statements as to how many sets this fellow, that fellow and the other fellow will produce during the coming season. The radio trade associations apparently whoop up the spirits of all concerned. But who is doing anything to increase the potential market? Well, that is perhaps an embarrassing question, so let's go on with other matters which may throw some light on the way out.

It is evident that the radio manufacturer with a tremendous plant, must keep busy. If this can be done with radio production, all the better. If not, let him fill in with any other line of products. Remember, one of our largest radio manufacturers today was originally engaged in producing automobile ignition equipment. The seasonable nature of that business, together with a large bakelite moulding department to be kept busy, encouraged this manufacturer to enter the radio field, first, by way of making the various components, and later, by way of complete sets. Many of our radio manufacturers have drifted into the radio field at first as a side line and later as a main proposition. There is no reason why the reverse process cannot take place today, with radio as the main line and with a satisfactory side line to keep up the necessary volume of business throughout the year.

Now the average radio manufacturer is set up to handle light manufacturing, notably of the assembly order, yet with a high degree of precision. The average radio manufacturer has had long experience in purchasing a wide array of materials, components and parts, and assembling these into a product that can be sold through established merchandising channels. Of course, the average radio manufacturer much prefers to play close to radio, and there seems ample opportunity to do so, with a bit of original research and engineering development.

Recently, we have seen the introduction of a so-called ethereal wave instrument introduced by a leading radio company, which can be played by waving the hands. The instrument comprises a beat note oscillator with a push-pull amplifier, feeding the standard loud-speaker. The cabinet is attractively shaped to form a rack for the music. It has a vertical rod on top, and a curved rod on the side. The top controls the pitch, as the player's right hand is brought nearer to it. The side rod controls the volume, from nothing when the left hand touches it, to a full volume when some distance away. The device is called the Theremin, after the young Russian Professor Leon Theremin, who invented it.

We predict a healthy demand for the Theremin, because it introduces in radio the one thing that has been obviously lacking—the ability of self-expression. Granted that the radio set has brought a world of music into the home, with the finest musicians, singers and ensembles, the fact remains that every individual desires to express himself or herself in a musical sense, and the radio set has provided no avenue for this desire. The fact that the company introducing the Theremin has seen fit to install a musical director whose job will be the developing of many additional uses for radio equipment in the home, presumably in the way of self-expression, is no doubt a promise of many more instruments of this general nature to follow.

In years gone by, we heard much about the possibility of an electric or radio organ. Why not? The Theremin generates a single pure tone, which in the lower register resembles a 'cello, and a violin in the upper register. Suppose the arrangement is elaborated upon, and several oscillators are employed, with a keyboard. What then? Well, it becomes possible to secure chords, or several simultaneous notes, which in turn means an organ effect. With various simple devices it becomes possible to interrupt the notes, warble them or do almost anything else by way of obtaining a variation from the pure sustained pitch. One of these days some bright radio genius is going to be heralded as a savant for introducing a radio organ, consisting of a number of oscillators feeding into a power amplifier and operating one or more loud-speakers, so that the average home can enjoy the finest kind of organ music played by means of a small keyboard and the conventional radio set. There is an enormous demand for such a device right now, and it should prove a valuable accessory for every radio set with power loud-speaker. Naturally, there are patents to be taken into consideration, but on the other hand there are licenses under which to operate, so that the patent end may be taken care of without undue difficulty. The principles are well known, for beat note oscillators have long been employed in testing loud-speakers. It is just a question of a bit of pep by way of working out a practical design.

Then there are talking pictures for the home. The radio manufacturer might well wonder what talking pictures have to do with them—and the answer is, "Plenty." Talking pictures will be of two general kinds, first, those making use of a standard home movie projector, with a turntable driven by the same motor, so as to keep in step, and playing the record through the usual electric pick-up. Secondly, the sound movie films, with pictures and sound on the same film and making use of the sound head for reproducing the sounds. In either event, the power amplifier and loud-speaker of the usual radio set will be employed with the talking movies, instead of going to the additional expense of duplicating equipment within five years. Here is where the radio manufacturer can begin planning for a healthy demand. It is a long drawn out job, of course, since the sound track on standard theatre film is only 1/10th of an inch wide, and probably must be lots smaller on the narrow width home film. But ingenuity and research will find a way out. Now is the time to get going, and prepare for the rush later on.

Then there is television. Of course it is slow in reaching anything near the practical state, but that makes it all the more exclusive and interesting for the enterprising radio manufacturer. Within a year, we shall have television outfits in the home—nothing very perfect, of

(*Please turn to page* 396)

Educational Systems for Industrial Employees

How General Electric Company Helps Workers to Advance and at the Same Time Eliminates Wastes Common to Untrained Employees in Industry

By W. J. HOCKETT

Supervisor Industrial Service
Ft. Wayne Branch, General Electric Company

THE necessity of special training for the many exacting and technical jobs in an electrical manufactoring organization has long been recognized.

The training of employees in a systematic manner was begun at the Fort Wayne Works of the General Electric Co. in 1913, with the establishment of a regularly organized apprentice system. The establishment of such a system of training soon inspired in the minds of other employees a desire for training along the lines of their work and there was an insistent demand for classes in the evening, after work, so that they might have an opportunity to study subjects applied to their regular jobs. This demand was met by arranging a number of evening classes in such subjects as mechanical drawing, practical electricity, and simple mathematics. With this beginning the educational program continued to grow and the number of employees participating has increased from year to year until at the present time there are over 1000 employees taking up work in the courses offered.

The evening schools are available to any employee who desires to improve himself in any particular line of work and if 15 employees ask for a specific subject the class is arranged and an instructor is provided.

Instructors are selected for their knowledge of the subject and their ability as teachers. Sometimes it is necessary to apply to the local high schools and nearby colleges and universities to get competent instructors for the classes.

The courses offered in the evening schools run for 12 weeks, 1 evening per week, 1½ to 2 hours. A small fee is charged employees who attend these courses as it is felt that they will take more interest in the class if they have invested something in it. A portion of the fee is refunded to all who attend 10 of the sessions. A fall and a spring term are offered each year and at the end of the spring term a banquet and commencement exercise is given by the Company for all those who have completed satisfactorily 10 lessons in the evening school. They are presented with a certificate showing that they have satisfactorily completed the unit course. Many employees receive as many as four certificates at commencement time.

In looking over our personnel we find that a large percentage of those who have made advancement have previously taken advantage of the evening schools to improve themselves. Our executives have found that the night school classes are a fertile field in which to look for earnest, hard working, dependable and enthusiastic men and women to take up positions of trust and responsiblity in the Company. Often we find some of our very keenest talent in our evening schools and we feel that these men and women might never have been discovered had they not had an opportunity to demonstrate their ability as thinkers and workers in these classes. They are persons who had to go to work while young and were unable to take advantage of the educational opportunities offered by high schools and colleges.

W. J. HOCKETT

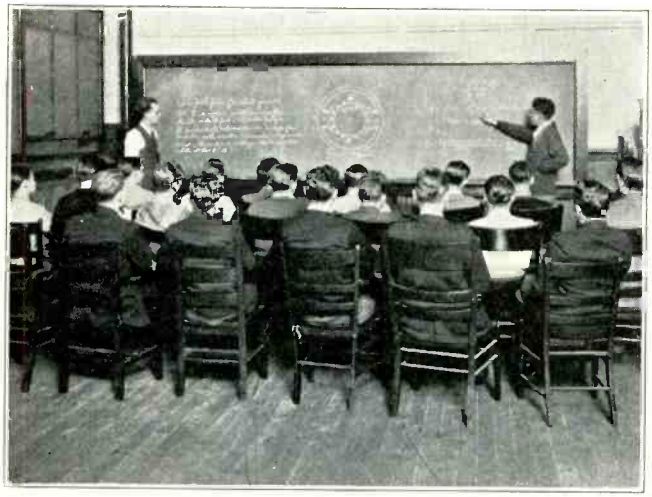
It is the policy of the General Electric Co. that promotion shall take place within the organization and positions shall be filled as far as possible by employees. The evening school is a great help in carrying out this policy.

Apprentice Schools

In the apprentice school a four year course for toolmakers, patternmakers and machinists is arranged. There is a three year course for electrical testers and draftsmen.

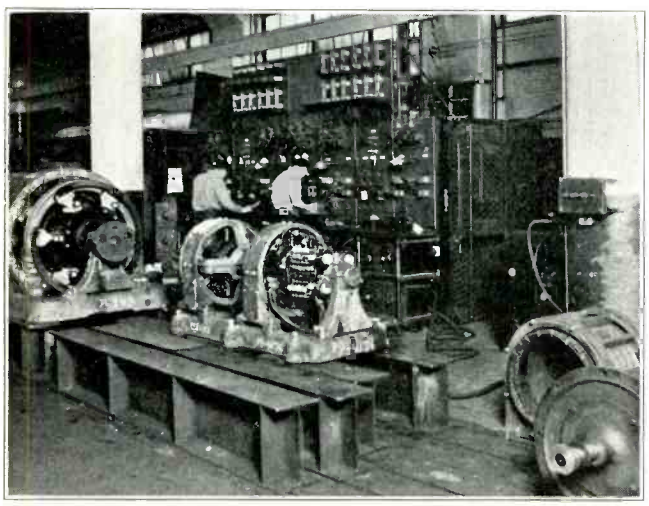
Applicants for the machinist and patternmaker course must have finished the eighth grade but most of the ap-

plicants for these courses are now high school graduates or young men who have had at least two or three years high school training. The applicant takes a regular examination and is given a number of tests so that the Supervisor of Apprentices may determine his inclinations. A two months trial period of training is given all apprentices and those who seem unsuited to take up the course and complete it are not allowed to go beyond the two months period.



An actual class being taught the theory and application of electricity

Classroom work is given all apprentices. This consists of many subjects directly related to the course in which the apprentices may be enrolled. Classes are held during working hours and the apprentice is paid the same rate for this time as he receives for his shop work. After an apprentice has received approximately one year's training in the apprentice training room he may be assigned to manufacturing divisions where he will do a variety of work and make contact with many foremen and workmen. During the last year of the machinist and tool-

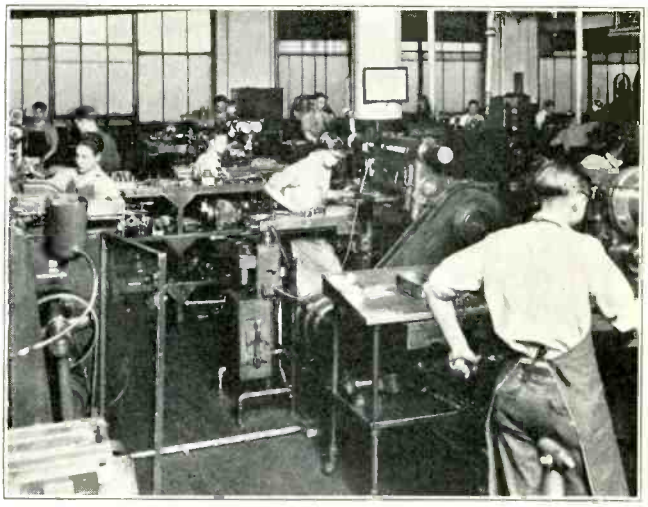


In this room the art of electrical testing is taught the learners

makers courses the apprentice is brought back into the training room, where he spends his time in fixture making, tool work, die making and advance machine work.

Upon graduating he is able to take his place in the tool rooms of the Company as a first class journeyman machinist or toolmaker.

Apprentices are given a certificate signed by the Manager and Chairman of the Educational Committee after the completion of their course. They are also given a cash bonus. The graduates of these courses are holding positions as machinists, pattern makers, tool-makers,



View showing the milling machine corner of the apprentice school.

superintendents, office managers, salesmen, instructors, tool designers, rate setters, engineers and draftsmen. Some of them have gone into special positions, such as methods of manufacturing, process engineering, chemistry and special service positions.

Special Machine Operators

A training school for special machine operators has been operated at the Fort Wayne Works of the Company for 12 years. Men 22 to 40 years of age who have not had previous factory experience are enrolled in this

This section shows the apprentice training room

training room. These men are given training by expert instructors in the operation of not to exceed two machines, such as drill presses, grinders, milling machines, lathes, automatic machines and semi-automatic machines, shapers and planers. The period of training is from 3 to 8 weeks. They are then assigned to the Manufacturing Division but remain under the jurisdiction of the training room until the division where they are working is satisfied with their progress.

(*Please Turn to Page* 400)

Power Detectors Produce Superior Results in Radio Receivers

The Negatively Biased Detector Gives Increased Output Without Distortion in Receivers Using a Detector and a Single Stage of Audio Frequency Amplification

By G. L. BEERS
Radio Engineer, Westinghouse Electric & Mfg. Co.

FIDELITY of reproduction is a major consideration in the modern radio receiving set. This can be improved, in general, by the use of a single audio stage, and a power detector, i.e., a detector capable of giving a high voltage output. The necessary higher voltage input is readily obtained from either a superheterodyne or a screen grid radio frequency amplifier. Additional improvements are as follows: —

One Audio Transformer—If interstage audio frequency transformers which are not perfect are used in the audio frequency system, the distortion from this source will be a minimum if only a single audio stage is used.

Reduced Alternating-Current Hum — Minimum hum is essential with alternating-current operated sets. The improved low-frequency response characteristics of the audio systems and loudspeakers in use in modern radio receiving sets has increased the difficulty of reducing alternating-current hum to an unobjectionable minimum. This hum is usually the result of variations in either the plate or grid voltage of the detector tube, as it is followed by the total audio frequency amplification in use in the receiver. As long as the hum from the detector tube is the controlling factor in determining the total alternating-current hum in the output, any reduction in audio frequency amplification will cause a corresponding reduction in hum. Or, on the other hand, if two receivers are designed which have the same fidelity characteristics and permit the same alternating-current hum in the output circuit, the first having two audio stages and the second a single stage, the second receiver will not require as effective a filter system as the first.

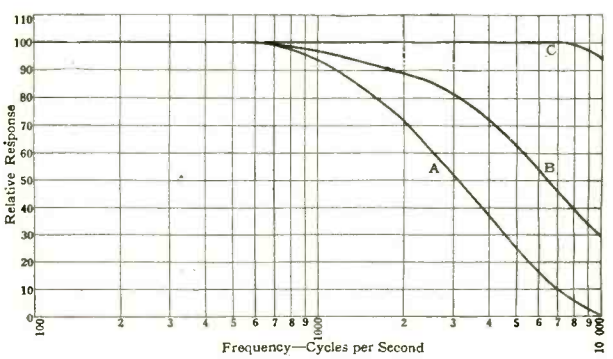


Fig. 1—Relative Frequency Response of Detectors

A—grid condenser—250 mmf.; grid leak—2.5 megohms.
B—grid condenser—100 mmf.; grid leak—0.25 megohms.
C—negatively biased detectors.

Microphonic Howls—Another problem encountered in modern radio receiving sets, in which the receiver and loudspeaker are mounted in the same cabinet, is the prevention of microphonic howls. These disturbances are usually caused by vibrations from the loudspeaker being transmitted to the tubes of the radio set either through the walls of the cabinet or the surrounding air. The use of dynamic loudspeakers fed by output tubes capable of handling considerable power has greatly increased the likelihood of trouble from this source. As this acoustic feedback usually occurs between the loudspeaker and the detector tube, and is, therefore, a function of the amount of audio amplification, the use of a single audio stage reduces the possibility of trouble of this sort.

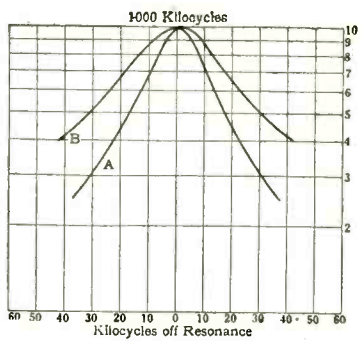


Fig. 2—Effect of the Detectors on Selectivity of Preceding Tuned Circuit

A—negatively biased detector.

B—grid leak and condenser detector.

Grid Leak and Condenser vs. Negatively Biased Detectors

Detection can be accomplished either by using a three-electrode vacuum tube and a grid leak and condenser, which was for a time almost the universal method; or by giving the detector tube a negative bias approximately twice that used for an amplifier tube with the same plate voltage. The characteristics which express the general merits of radio receiving sets are fidelity, selectivity and sensitivity. The effect of grid circuit and plate circuit detectors on these characteristics will be considered in connection with their ability to provide high voltage outputs.

Frequency Response

Curves *A*, *B* and *C* in Fig. 1 show the comparative frequency response characteristics of grid circuit and plate circuit detectors. All three curves were obtained under the same conditions. The same UY-227 tube was used for each curve. The plate potential was 135 volts. The audio frequency output is plotted in percent of the response at four hundred cycles. Curve *A* is the characteristic of a grid circuit detector using a grid condenser of 250 mmf. and a leak of 2.5 megohms. The curve shows the decided reductions in high frequency response due to the use of this grid leak and condenser combination. Curve *B* shows the characteristic obtained using a grid leak of one-quarter megohm and a condenser of 100 mmf. This shows a decided improvement in high-frequency response. Curve *C* gives the frequency response characteristic obtained from a negatively biased detector. A comparison of these curves shows the superior frequency response characteristic of the negatively biased detector. A detector giving the characteristic shown by curve *A* is not considered satisfactory for a modern radio receiving set.

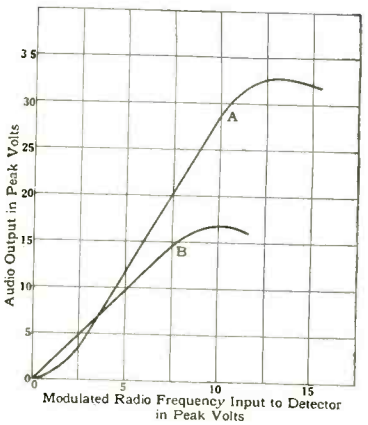


Fig. 3—Comparison of Detector Outputs on Basis of Equal Inputs to Detector Grid

A—negatively biased detector.

B—grid leak and condenser detector.

Selectivity

Curves *A* and *B*, Fig. 2, show the effect to both grid-circuit and plate-circuit detectors on the selectivity characteristic of a tuned circuit. Both curves were taken under the same conditions. The peak voltage at resonance was six volts. The plate potential on each detector was 135 volts. The grid circuit detector used a quarter megohm leak and 100 mmf. condenser.

These curves show that the input conductance of the grid leak and condenser detector is such as to make the selectivity characteristic of the tuned circuit much broader than the characteristic determined by the losses in the tuned circuit itself. The normal selectivity of the tuned circuit used for these curves was as broad as desired for good fidelity. Since selectivity is likewise a characteristic of major importance in modern receiving sets, the effect of the grid circuit detector on such a tuned circuit is decidedly undesirable.

Sensivity and Maximum Output

One of the requirements of a power detector is that it be able to provide sufficient audio output to obtain maximum undistorted output from the output tube under the various degrees of modification used by our numerous broadcasting stations. There are some broadcasting stations which operate with an average modulation as low as 15 percent. Experience has shown that it is very desirable that the detector should not overload before the output tube does when receiving such a station. To fulfill this requirement when using a UX-245 output tube at maximum rated voltages, the peak audio voltage on the grid of the output tube must be approximately 50 volts. If the interstage audio frequency transformer has a step-up ratio of three to one about seventeen volts will be required across the primary. If a UX-250 output tube is used under the same conditions the detector will have to provide the primary of the audio transformer with a peak audio voltage of approximately twenty-seven volts. Both grid circuit and plate circuit detectors will be considered in the light of these requirements.

The UY-227 tube is ideal for use in alternating-current operated receivers as either a grid circuit or plate circuit detector since it is of the unipotential cathode type. Plate potentials in excess of 135 volts should not be considered when using a UY-227 tube as a grid leak and condenser detector. With this plate voltage the plate current, when weak signals are being received, will be in the neighborhood of fifteen milliamperes. If the tube is operated under this condition for any length of time its life may be seriously reduced. Plate potentials up to 250 volts are permitted on the UY-227 tube when used as a plate circuit detector. With this plate potential the plate current under normal operating conditions will vary from one-half to five or six milliamperes. These plate potentials will be used in considering the maximum audio output from the two detectors.

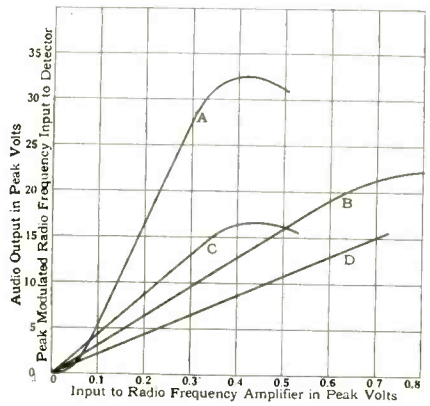


Fig. 4—Comparison of Detectors on Basis of Equal Inputs to the Grid of the Preceding Radio Frequency Amplifier

A—output of negatively biased detector.

B—voltage across the tuned circuit feeding a negatively biased detector.

C—output of grid circuit detector.

D—voltage across the tuned circuit feeding a grid circuit detector.

Curve *A*, Fig. 3, gives the relation between the peak modulated radio frequency input and the audio output of a negatively biased detector. The carrier

was modulated thirty percent at four hundred cycles. The plate voltage on the detector was 135 volts. The peak audio output was measured across the primary of an audio frequency transformer connected in the plate circuit of the detector tube. Curve *B* is a similar curve showing the output from the grid leak and condenser detector under the same conditions. These curves give a comparison of the outputs of the two detectors on the basis of the same peak voltage on each detector grid. The curves show that the grid circuit detector is from two to three times as sensitive as the plate circuit detector for peak voltage inputs of two or three volts. For inputs of five volts or more the plate circuit detector is more sensitive than the grid circuit detector. These curves also show that the maximum audio output of the negatively biased detector is twice that of the grid leak and condenser detector when operated at the same plate potential.

Curve *A*, Fig. 4, shows the audio output of a negatively biased detector plotted against input to a tuned radio-frequency amplifier which fed the detector. Curve *B* shows the peak modulated radio frequency voltage as measured across the tuned circuit to which the detector was connected. This tuned circuit is the same circuit which was used for the curves in Fig. 2. A 1000 kilocycle carrier, modulated 30 percent at 400 cycles, was used in obtaining these curves.

The output of the grid circuit detector measured under the same conditions is shown in curve *C*. Curve *D* gives the voltage across the tuned circuit when connected to the grid leak and condenser detector. A comparison of curves *B* and *D* gives the reduction in the voltage across the tuned circuit due to the input conductance of the grid circuit detector.

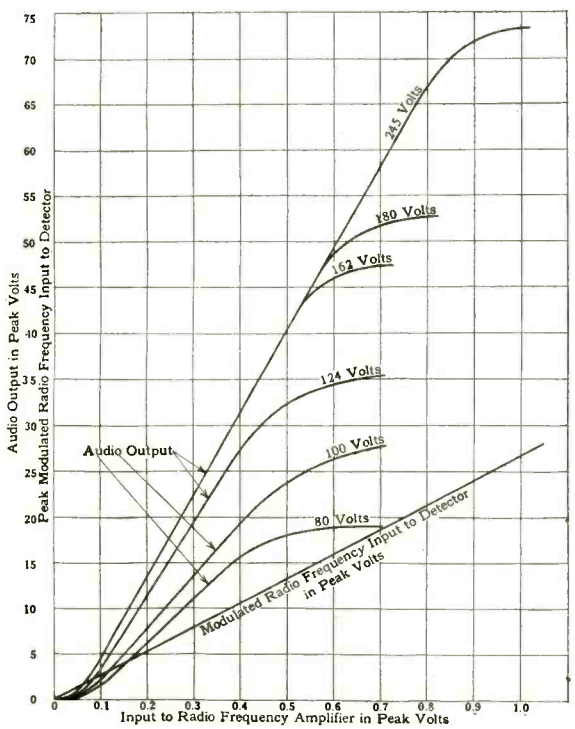


Fig. 5—Effect of Plate Potential on Maximum Output of a Negatively Biased Detector

A comparison of curves *A* and *C* shows that for weak inputs, when the effect of the grid circuit detector on a tuned circuit is taken into consideration, the overall sensitivity of the system using a grid leak and condenser detector is only slightly greater than when the plate circuit detector is used. For moderate or large inputs the overall sensitivity is considerably greater when the negatively biased detector is used. Since a tuned circuit is used to feed the detector in the majority of the radio receiving sets, at the present time, these curves give a comparison of the two detectors under operation conditions.

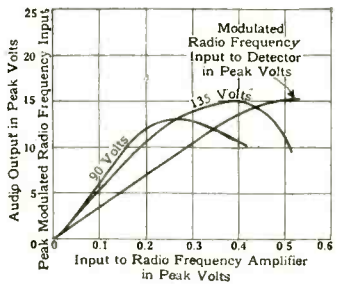


Fig. 6—Effect of Plate Potential on Maximum Output of a Grid Circuit Detector

Effect of Plate Potential on Maximum Output

Negatively Biased Detector—The curves in Fig. 5 indicate a maximum audio output that can be obtained from a UY-227 tube used as a negatively biased detector when various plate potentials are used. The carrier used in taking these curves was modulated 30 percent at 400 cycles. The maximum peak audio voltage in the plate circuit of the detector using a plate voltage of 250 is about 70 volts. Approximately 35 volts would be obtained with 15 percent modulation. With an audio frequency transformer having a three to one step-up ratio this voltage would be sufficient to obtain maximum undistorted output from a UX-250 output tube. Likewise it is evident that with a plate voltage of 160 sufficient audio output is obtained with the carrier modulated 15 percent to obtain maximum undistorted output from a UX-245 output tube. These curves show that the maximum audio output from a plate circuit detector is approximately a direct function of the plate potential.

Grid Leak and Condenser Detector—Curves giving the maximum audio output of the grid leak and condenser detector for plate potentials of 90 and 135 volts are shown in Fig. 6. These curves were taken in the same manner as those in Fig. 5. From these curves it is evident that if an audio frequency transformer with a three to one step-up ratio is used it will be impossible to get sufficient audio output from the grid leak and condenser detector to obtain maximum undistorted output from either a UX-245 or UX-250 when the carrier has a modulation of 15 percent.

These various sets of curves show in a general way the superiority of the negatively biased detector for applications in which the audio frequency system consists of a detector and single stage of audio frequency amplification.

A Field Without Fences

The Radio Service Man of Tomorrow Will Follow the Wings of a Nation

By H. G. BOYLE
The A-C Dayton Company

DURING the ten years just past the United States Government has expended a tremendous amount of time, energy and money directed by some of the finest engineering minds of the country in a solution of various problems connected with the transmission and reception of radio signals between aeroplanes in flight and their home ports. The tremendous increase in the number of commercial air lines which have been established in this country seems to indicate that the advancements made in air craft engineering and design have at last paved the way to everyday use of wings as a common carrier for man and his commodities.

In order that schedules may be maintained, that flights may be safely completed, and in case of necessity, assistance secured, it is imperative that every plane carry some method of conveying information and obtaining directions from its base. The apparatus necessary for such work is in most cases considerably different from that utilized in everyday broadcasting or amateur handling of traffic. When land stations are constructed no restrictions are made as to size or power while any installation made in a plane must of necessity be compact and one hundred percent efficient in order to obtain the desired performance without taking up more than its share of the available space.

Power must be obtained from wind driven dynamos which obviously cannot hope to compare with the power turbine and motor dynamos in the land stations.

In the case of the receiving set everyone is probably familiar with the general method of design which has been followed in the past three or four years in the construction of broadcast receivers. When inspection is made of the receiver utilized for similar work in a plane the vast difference is immediately apparent. In addition to combining sensitivity, selectivity and power, the receiver must be kept extremely light and compact.

We recently had the pleasure of inspecting a new receiver design for air craft use which utilized three screen grid tubes, carborundum crystal detector and one stage of power audio. While the tone of the combination left much to be desired, reproduction was quite clear and understandable. The unit was so compact and so neatly designed that when it was not in use it folded into the mouth of its own loud speaker. Connections to the generators on the wings were made by means of flexible cables within the frame work of the plane. A short antenna had been constructed parallel with the wings and the frame work was utilized as a counterpoise.

After considerable effort the engineer in charge was convinced that we had no ulterior motive and very kindly explained the circuit used. At first glance it appeared quite simple but after further study it became apparent that trouble which might develop could never be located by the ordinary set analyzer or series test meter methods.

It occurred to us at the time that the principles which had been incorporated to such advantage would very probably be followed by any commercial receiver which might be manufactured in the future for use of commercial air lines. In investigations we had made of similar apparatus the engineering design principles generally followed regular broadcast practice but the efficiency, compactness, and really radical engineering of this new type leads us to believe that it will be in greater favor than any other we have ever seen.

Providing the circuit is commercialized and built in quantity for installation in commercial planes it is obvious that someone will be responsible for its continuing in operating condition. Our conclusion may be wrong, but we do not believe that five percent of the radio service men are capable of intelligently trouble shooting such a receiver. While it is true that if the design becomes a commercial product a considerable number of service men will become familiar with its characteristics, they will not be sufficient. We believe also that other designs will be worked out and new principles discovered which will be as radically different as this one and they will all require a specific knowledge on the part of any service man in order to keep them operating.

THE importance of proper radio equipment for aeroplanes is stressed in Mr. Boyle's current article. It can be readily seen that a huge market for the radio manufacturer exists here provided he is willing to do the research work necessary to give the aeronautical industry the kind of radio equipment that will make for safe flying.

The field which opens up for a service man who gets in on the ground floor in the service of plane equipment is really tremendous. The trouble which has been experienced in the past three or four years with ordinary broadcast equipment which is comparatively simply engineered seems to indicate that there will be a considerably higher percentage of trouble developed in the much more complex designs necessary in plane installations. While it is true that the apparatus would probably receive more stringent inspection and more careful attention than ordinary, still some trouble is bound to develop.

(*Please turn to page* 406)

Recruiting Radio's Retailers—II

Some Notes on the Shock Troops of the Industry—Who They Are and Where They Are Coming From

By ARTHUR ALLEN

IN the preceding article we regretfully broke off a summary of the crazy quilt of retailing as it has been revealed by recent investigations of governmental bureaus and trade associations for want of space with the agreement that we would this month consider from what sources the radio industry will most probably recruit its dealers in time to come.

It was found that the manufacturer may have a relatively small number of dealers on his list and still be overwhelmed by the profusion of types of outlets. The retail distribution census conducted some time ago by the Federal Bureau of the Census in eleven representative American cities, located in every corner of the nation, and discussed at length last month indicated 93,928 stores but 221,789 outlets as a total of all the classes of stores surveyed.

Perhaps this requires a word of explanation. There may be an even 100 stores in a metropolitan center calling themselves shoe stores but there will be perhaps 500 stores selling shoes or, in other words, 500 outlets for shoes or shoe manufacturers.

Coming back to the eleven cities covered in this census and examining the actual figures for the field of radio, we find that in these eleven cities—Atlanta, Baltimore, Denver, Kansas City, Mo., Providence, San Francisco, Seattle, Springfield, Ill., Syracuse, N. Y., Fargo, N. D., and Chicago—at the time of the survey, there were 368 retail establishments considering themselves to be primarily radio stores. But—

There were 1,079 retail outlets for radio.

And only 47 per cent—less than half—of the total retail volume in radio was being done by the supposedly honest-to-goodness radio stores.

A survey of the range of distribution of various products now in process of analysis by the United States Department of Commerce is said to show that there are nearly 100 different types of outlets for radio ranging from beauty parlors to garages. Nor can any single estimate include all the hybrids in the business.

But the history of everything is the story of change and revolution is a noun usually denoting marked and rapid change; and this revolution in retailing is no exception.

Not all the present retailers of radio will continue this pursuit. The present figure—in round numbers—of 40,000 dealers in the United States selling radio by no means represents all those who started, only to drop out of the picture for one reason or another. Only the other day a man who has accumulated wealth in a dozen lines of endeavor and whose natural aptitude, financial situation, business experience and qualifications generally are far beyond those of the average merchant told us that he had just abandoned the radio retailing business in which he has been interested since soon after the start of the business as a business because he could not make money at it. He credits his inability to profit as a radio retailer to conditions which surround the business of thousand of other dealers. There is nothing essentially local to the reasons he ascribes for his failure to prosper in radio merchandising. And yet thousands of other dealers, much less favorably equipped than this individual, are prospering enough at the business to keep on trying and many are unquestionably thriving beyond any ordinary shred of doubt.

There is no place here to cite many specific examples of the radio dealers who have begun—and quit. But you, in the manufacturing end of the industry, know them. Have you ever calculated your turnover in dealers? How many dealers once on your list are now selling other lines of radio? How many have dropped out of the radio procession altogether?

THE radio industry, commercially speaking entirely a development of the last decade, has seen great changes in a short time and will doubtless see many more. To review some of these changes as they may help to forecast the future and to speculate, as sensibly as possible about what the future may hold for one of the most important branches of the industry—the distributive branch — are the functions of this article and the one that preceded it.

So old dealers are going and new ones are coming. Where will the new ones come from and which of these will be best equipped to do the radio retailing job?

A month ago we quoted some figures which are, as we then pointed out, the best obtainable. Statistics compiled and scanned by able sources indicate that approximately 40,000 retailers of radio, in as a recent period as any for which it is possible to compile reasonable accurate figures, were doing an average annual radio volume of $14,528 with an average unite sale of $163.50; and this in a business which is still highly seasonable despite all the conversation to the contrary, witness the sensible estimate that 40 per cent of the current calendar year's business will be done in a single quarter.

There are, of course, plenty of other fundamental facts which affect any intelligent surmises about where radio retailers are to come from and what they will be like. But those just cited in the preceding paragraph are quite enough for the present purpose.

First of all then, what about the so-called exclusive radio store—the *radio shoppe* which has been infesting

every small town and every shopping neighborhood of big towns in times past. The tense employed was deliberately chosen for this type of store seems definitely on the wane. Observe any typical community and you find that the radio shops as such come and go with startling rapidity. And, though a dealer begins as a radio exclusively, if he stays in business long you invariably find him adding other lines of merchandise to his stock which are as unrelated to radio as sheet music, refrigerators, electric exercisers and what not. Radio, under any average conditions, does not seem to be the likely subject of full-time, full-store activity.

As was pointed out last month, it is no secret that various set manufacturers have limited their dealer setups to one or several hard and fast classifications of dealers and have deliberately ignored all other types of merchants in the scramble for retail outlets. To investigate the merits or demerits of such a program in terms of generalization is patently impossible. Where one manufacturer seeks representation among the power companies, another passes up the possibilities of utility outlets and concentrates on music stores or department stores or, perhaps, the so-called electric shops operated by electrical contractors and merchants. One radio manufacturer says the hardware stores are places to sell tools. Another visions them as excellent sources of retail radio business.

There are certain demands made of the radio dealer which every dealer must look upon as necessities and must always meet if he is to continue with profit in radio retailing. These considerations are, however, familiar to the logical readers of this article so that we can pass on to a discussion of the possibilities of various retail classifications.

It should be emphasized that the writer is entirely unbiased. In the preceding article and also in the present effort, the endeavor is to present the facts as they are and to consider the possibilities as nearly as possible on a basis of these facts. Issue is not taken with present trends nor are they endorsed. Likewise, while it would be simple to make forecasts of radical change and, while several such changes may even be indicated to a slight degree, there is nothing to be gained by deviating too far from the normal trend. For this reason, let us limit a summary of who is likely to do the radio retailing job in the future to only the likeliest probabilities on a basis of past performance.

Radio sets fit particularly well into the picture of two well established types of retail outlets, the music store and the furniture store. The first of these, taken as a class, has done much more of a radio retailing job than the latter. The primary reasons are not hard to find.

The piano, long the stock in trade of a host of music stores, was suffering from inter-industry competition, the advent of the automobile, the craze for furs and so on, long before radio receivers in every home were even thought of. The high water mark of the piano industry came many years before the advent of radio. But it was radio that gave the piano business a final push in the face and what it didn't do to the phonograph and record business which had subsequently come to be the music dealer's pride and joy is nothing to write the old folks about. So many a music dealer welcomed radio, whether he liked the idea or not, as a saviour of his business and adjusted himself and his store to radio.

Although many furniture stores are selling radio, with the exception of the outstanding instances always to be discovered in any summary, these establishments, as a class, have not distinguished themselves. It is no trade secret that everything in the furniture business is not 100 per cent perfect. However, the injection of the style idea in furniture has had its favorable as well as unfavorable aspects. And though people can get along without the finest in furniture in order to buy automobiles, jewelry, permanent waves and so forth, the fact remains that furniture, compared to the one-time stock in trade of the out-and-out music store, is a staple line.

THIS article winds up the discussion begun by Mr. Allen in these columns in September. In the first article the author traced a few of the typical cross currents which are complicating the whole field of retailing. This month he is more concerned with the effects these changing trends are likely to have upon radio merchandising.

This article, like the one that went before, is at least interesting if not also actually helpful to our readers. At best, as the author himself points out, these are largely matters of speculation and if you differ from him in viewpoint, your comment will be welcomed by the editors.

At all events, the fact remains that radio fits in most easily with the training of dealers in music and furniture stores. The music dealer knows how to retail home entertainment and the means thereto. The furniture man knows how to sell furniture. And either or both these considerations are the most vital of all those usually involved in the sale of a radio set at retail. It stands to reason that any consideration of either of these types of stores—or of any to follow—must include consideration of the type of set and the education of the new dealer on the phases of radio selling with which he is unfamiliar; that is, a furniture man must take cues from the music dealer and *vice versa*—and the manufacturer will probably have to furnish the cues—but it remains an important truth that there are still plenty of unemployed possibilities for the radio industry among dealers of these two classes.

A leading publication in the electrical field, *The Electrical Dealer*, more than a year ago made an exhaustive study of the radio retailing activities of various types of electrical and non-electrical stores including power companies, electric shops and contractor-dealers, hardware merchants, furniture and house furnishing stores and department stores.

The figures compiled were based on the operations of thousands of dealers in these various groups and of a wide spread, both in point of number of stores and di-

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What About Remote Control?

Some of the Methods Employed Today and a General Summary of the Situation

By K. A. HATHAWAY
Associate Editor

THERE is probably no phase of the radio industry that receives more comment today than does remote control. And, in spite of the fact that many have been working on the problem there is none that can be said to fully answer the purpose to the extent that it meets with popular approval.

The strange part of the situation is that few seem to be sure of just what is wanted along the line of a remote control device. The majority of those introduced have been in the form of an attachment which connects to the radio receiver permitting the tuning of the set from remote parts of the room or apartment. Such apparatus usually entails the stringing of a cable around the room and unless we have been greatly misinformed the housewife would not submit to anything of that nature. In fact, it is known where at least one remote control device failed to go into production after making a survey in which more than thirty men and women gave their views of the practicability of the device. The men favored it, while the women turned thumbs down. It was not until afterwards, many months in fact, that the real cause for the disapproval was known and then it turned out that the women did not like the idea of stringing the connecting wire across the floor. A check-up revealed that nearly all women adopted the same attitude.

Therefore, we must eliminate any unsightly wires if the remote control feature of the radio receiver is to meet the acceptance of the real buyers of radio, the women.

A remote control device should be adaptable to all sorts of abodes, houses and apartments alike. In a large number of apartments already constructed it would be extremely impracticable to expect to make a permanent installation of a remote control system while in the homes we find a greater amount of leeway in that the home owner can provide the wiring under the floor or in the attic at his convenience.

The bulkiness of the remote control device should be kept at a minimum. If it is to be adaptable to all receivers it must not be so large that it will fit equally well in either a large or small receiver.

Simplicity is another requirement, for much of the work of radio engineers would go for naught if an intricate remote control device is to be included in the set construction.

With all this in view, let us look further at the problem as it presents itself. There are in existence some ten million radio receiving sets of all types and all makes. To get a universal unit that can be adapted to each and every one of them seems like an impossibility and in fact is an improbability. However, many of those receivers can be changed to permit storing them in the closets and placing the connections outside at convenient positions or to provide controlling apparatus in various rooms.

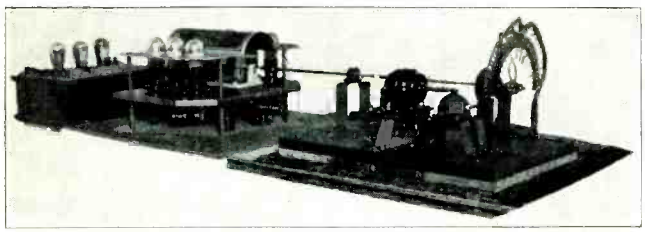
Let us look at some of the apparatus that has been introduced. There is the Kolster unit which they are providing for use with their own receiver. Not being particularly interested in the application of the device to other sets in general we shall pass them by with a cursory explanation. Their arrangement consists of a motor to turn the tuning condensers and an automatic tuning device which can be handled manually or by the remote control apparatus. Pressing one of the buttons on the remote control unit actuates a relay that turns on the motor which rotates the drum until a contact made by the preselector disengages the relay and causes the motor to stop. Their remote control device like many others is lacking in that it does not permit the tuning of the set other than to select the stations which have been previously determined.

Zenith is another manufacturer who has been working on a remote control device in connection with their automatic tuner. Here too a motor rotates the dials until stopped by the automatic arrangement as adjusted previously.

JOSEPH ATTARDO

A report from New York gives the details of a remote control unit designed by Joseph Attardo. Although rather complicated, it must be said that Mr. Attardo has gone far in his development. At the same time it is necessary to make an adjustment by manually tuning the receiver before the apparatus is operative. The accompanying diagrams will show Mr. Attardo's outfit in greater de-

tail. The pushing of a button on the control panel connects through to one of the contact strips on the remote control apparatus and the motor rotates until the contact is made at which time the relay acts to disconnect the motor circuit and the tuner stops. An indefinite number of stops can be provided, depending upon the number of stations which the set is capable of picking up.



Remote control unit developed by Joseph Attardo

Albert E. Ellinger, an electrical engineer who is also chief engineer of the Ellmar Radio and Television division of Markel Electric Products, Inc., Buffalo, has designed another remote control device of a different character, according to the information which we have at hand at present. His, too, is of the pre-selector type but eliminates the use of relays, using instead a system of solenoid coils operated on alternating current. Full details of this unit will be published in a succeeding issue.

Arthur H. Watson of the Watson Television laboratories, Chicago, has designed another type of remote control and automatic tuner in which the sliding armature replaces the motor. The pushing of the buttons serves to make contact with the brushes that slide on the armature segments and halt the operation when the insulation between the two segments is reached.

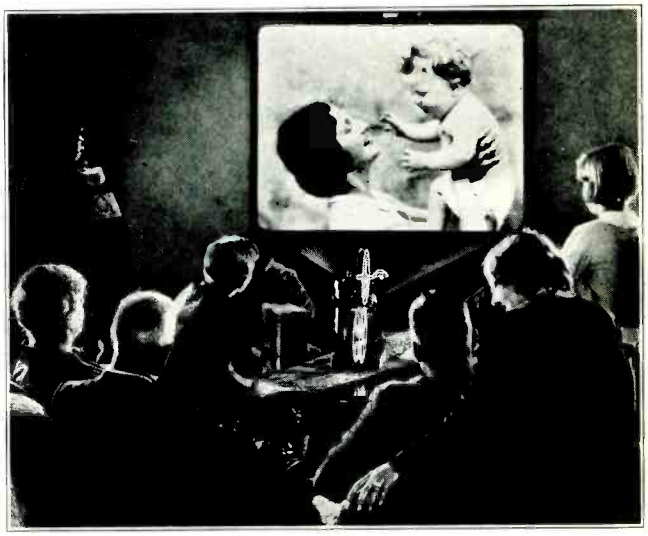
Elmer E. Burns, instructor in physics and radio at Austin high school, Chicago, is another who worked out a remote control device, this one operating upon the station signal and stopping the rotation of the tuning units when the station signal was tuned to resonance. A push of the button served to start the apparatus in motion again to select the next succeeding station so that the operator had only to keep pressing the button to tune in that type of program to which he or she desired to listen. A synchronous motor has been used by Mr. Burns in the interest of eliminating arcing and therefore interference. The latest development of Mr. Burns have not been available in time to include in this discussion.

Utah and Carter have also been working along lines similar to those mentioned ahead of Mr. Burns' experiments.

Just what the outcome of the remote control problem will be remains to be seen. It is quite logical that while its adoption will not be universal there will be a large number of them used not only in the interest of laziness, but also for the convenience which such an arrangement would afford.

HOME MOVIES BY KODEL

Thru an invention which enables motion pictures to be taken laterally as well as horizontally upon the same film, the cost of motion pictures for the home has been reduced seventy-five per cent, bringing home pictures within the reach of the great mass of people. A family in almost any circumstances may take motion pictures of the daily events that revolve around the family group and preserve an active, animated record of life at a cost that is far less than the ordinary "still" pictures.



Home motion pictures will take their place with radio in popularity within the next several years according to Mr. Ogden

The announcement of this forward step in home entertainment, to take its place along with radio and the automobile, was made by Clarence E. Ogden, President of the Kodel Electric & Manufacturing Company, pioneer radio manufacturer of Cincinnati. It is the result of the realization that radio, which became the fastest selling piece of merchandise in history early in its inception, even in the days of crystal sets, has pointed the way to home entertainment. Today, according to Ogden, home entertainment is changing the aspect of American home life, bringing entertainment, music, drama, religion, political viewpoint, etc. into the home.

CROSLEY PLANE ATTAINS 125 MILE SPEED

Some months ago it was announced that Powel Crosley, Jr., president of the Crosley Radio Corporation of Cincinnati, was engaged in the experimental development of airplanes.

The first high-wing open monoplane has been in the air several months. Recently the second experimental model, a high-wing, four-passenger cabin plane, was flown for the first time.

Both planes are in the Moonbeam series and both proved themselves highly successful in experimental flights. The cabin plane, which is driven by a five cylinder Wright whirlwind motor, has a cruising speed of 100 miles an hour and a top speed of 125 miles per hour. Pilot Russel O. Wiest, who was at the controls when the ship made its aerial debut, declared it was remarkably easy to handle and showed perfect balance.

Powel Crosley, Jr., is building an experimental laboratory factory on a flying field near Sharonville, Ohio.

Scientific Employment

Better Men Mean Bigger Profits in Any Field

By WILLIAM W. HARPER
Consulting Engineer

THE careful selection of technical radio personnel for various branches of the industry continues to be one of the most persistent problems. With efficiency and ultimate success depending to such a great extent upon technical factors, the necessity of employing men of sufficient caliber is clearly evident.

In the old school of hiring men we find one habit, or possibly it was a weakness, on the part of the employers. An employer, knowing nothing about radio from a technical standpoint, frequently attempted to determine an applicant's ability without technical aid. The employer assumed, without just reason, that he was able to size-up a technical man. Such hallucinations have been known to bring wreck and ruin to many businesses.

This condition follows from the fact that most employers are analytical only with financial matters. They have formed the habit of jumping at conclusions on various other things. For example, if the family Doctor hasn't succeeded in killing off any of the family the Doctor is a "specialist—one of the best men in town." If his golf game is good the professional instructor is one of the best in the land. If his liquor doesn't blind, maim, or kill, his bootlegger is an ace. It never occurred to him to measure up these men scientifically. When it comes to radio men, although there is much bickering back and forth it may be summed up as follows:

Employer: "*Do you know the subject of radio?*"
Applicant: "*Yes, I know the subject of radio.*"
Employer: "*Very well, you may start Monday.*"

Needless to say this procedure is unfair in all respects. The modest man who has worked hard to acquire a certain amount of knowledge suffers a great deal. The inefficient mental fumbler who fences with twenty-five cent words is the fellow who gets the real breaks, and the manufacturer pays and pays.

The writer recently over-heard an employment expert in one of our radio factories. A youth entered the employment office and asked for work. The employment expert inquired as to his radio experience. The boy admitted he didn't know a great deal about radio. The employment expert put him on an assembly bench. Another lad entered the office a short time later and admitted he was a pretty good radio man, with the result that he was given a good job in testing and inspection work. A later analysis of all personnel disclosed that the first young man was an expert tester, while the "good radio man" couldn't solder well enough to qualify for the assembly line.

These inaccuracies in selecting men are greatly reduced by new methods which are being adopted at this time. Although they could not be considered new in a general sense they are at least new to the radio field. Briefly, this new method of employment consists in giving applicants well conceived verbal and written examinations to test their fitness for any particular work. Thus, an employer in need of a certain type of man has a set of examination questions prepared for him by some authoritative source and the applicants which appear are invited to take this examination. The men who know their subject and are qualified in personality, integrity, et cetera, are chosen.

This process of selecting men has many desirable features. It encourages men to know their business. It gives the intelligent men a chance to prove their worth. It gives the employer a team of efficient workers. Must we add that these factors collectively produce greater financial profits?

Various manufacturing and trade associations are becoming concerned with this subject. Examinations and questionnaires of many varieties are being evolved in the hope of improving the standard of personnel. The employer should cooperate in these matters to a maximum degree. Inefficiency is a costly element in our industry and we have now matured to the point where it should be no longer tolerated.

It may be of interest to include in this article a few technical questionnaires to more clearly illustrate the efforts which are being made.

The Midwest Radio Trades Association have prepared and are giving examinations to radio service men. Mr. Allan Forbes, Chairman of the Technical Committee, has submitted the following questions as being typical of some of their examinations:

THEORY

1. *How does a dynamic loud speaker differ from a magnetic cone speaker?*
2. *Draw a circuit diagram of a complete B-power system using a 280 type tube rectifier and state what the function of each part is.*
3. *What particular advantages do screen grid tubes offer? Can screen grid tubes be used in a neutrodyne?*
4. *Why is a baffel needed with a dynamic speaker?*
5. *Describe and illustrate two methods of coupling a loud speaker to an output power tube. Why are these necessary?*

PRACTICE

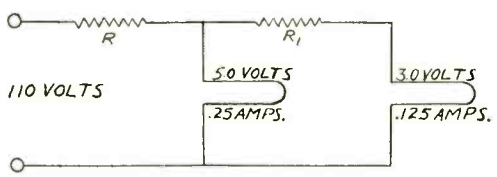
1. *If you were testing an A.C. set and found plate current on all the tubes, but the first audio, in what two pieces of apparatus would you expect to find the open circuit?*
2. *Are there any antenna substitutes (to your knowledge) that will give as strong a signal under all conditions as the aerial specified by the manufacturers for their sets?*
3. *Would you use a voltmeter or an ammeter to test the condition of a 1½ volt dry A cell?*
4. *Which would be more damaging to a power tube, a shorted or open grid bias resistance? Why?*
5. *If a set is noisy and you knew it to be in the chassis, how would you proceed to isolate the source of the noise?*

The following questionnaire was compiled for the use of a Chicago radio manufacturer as an aid in selecting men for various technical duties. It is to be understood that radio men for technical work in various capacities must be given examinations of a type which really determine their ability in the particular work for which they are desired.

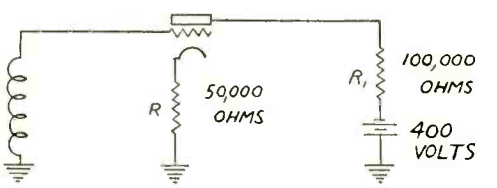
1. *Give the simple equations showing the relation between current, voltage, and resistance as expressed by Ohms Law.*
2. *If you know the amount of current passing through a* 1000 *ohm resistance, how do you determine the amount of power dissipated in the resistance?*
3. *Given a voltage of* 110 *volts. What size resistance will be necessary to drop this voltage in order to work a vacuum tube filament operating on* 5 *volts and drawing* .25 *amperes? How much power will the resistance be required to dissipate?*
4. *Fill in the missing portions of the following equations:*

$$Watts = \_\_ \times I$$
$$Watts = \_\_ \times R$$
$$Watts = \_\_ \times 1/R$$

5. *Determine the values of R and* R_1 *in the following circuit:*



6. *In what units do we measure the intensity of a radio wave?*
7. *What are the important factors of a vacuum tube?*
8. *Explain what is meant by a neutrodyne circuit.*
9. *Draw the essential parts of one or more neutrodyne circuits with which you are familiar.*
10. *After a neutrodyne receiver has been assembled and the circuits tested for continuity what is the next step in its preparation for final inspection?*
11. *Explain the technic which you would use in neutralizing a neutrodyne circuit, listing the various accessories and apparatus which you would require.*
12. *In the event one or all circuits of a neutrodyne fail to neutralize properly where would you look for the trouble?*
13. *The vacuum tube in the following circuit draws* 2 *milliamperes. The resistance values are given in the drawing.*



   A. *What is the grid bias voltage?*
   B. *What is the effective plate voltage?*
   C. *What is the voltage drop across the resistance R?*
   D. *What is the voltage drop across the resistance* R_1*?*
   E. *How much power is dissipated in each of these resistances?*

14. *Approximately how much power will be dissipated in the biasing resistance of a push-pull amplifier using UX* 245 *tubes operating at normal voltages? What will be the size of the bias resistance in ohms?*

In the March, 1928 issue of *Radio Manufacturers' Monthly* the writer published a questionnaire intended for the selection of laboratorians and assistant engineers. Various other questionnaires have been discussed from time to time and it is to the interest of every employer to have his employment department make a special study of this method of selection. The questionnaires in this article, of course, are merely suggestive. It is urged that in each case the employer have drafted a group of questions in accord with his exact requirements.

The writer had an intimate contact in the use of the second questionnaire given in this article. Out of approximately seventy men who took the examination only ten made a grade of over ninety per cent. Almost fifty per cent of the men were unable to answer more than a few questions. The majority were products of some of our correspondent and trade schools and had rather pretentious service records. A casual interrogation of these men by old methods would undoubtedly convince one that they were all qualified in respect to the examination as given. It was most distressing to find that only ten out of the seventy radio men could actually draw a typical neutrodyne circuit. As for knowledge of fundamentals, only graduate engineers and very rare testers and service men successfully use Ohm's Law.

The time has been reached when the radio industry must devote considerable attention to the scientific selection of man-power. Organization efficiency and actual financial profits depend to an uncomfortable degree upon the ability of the individual workers.

DE FOREST PROGRESSES

During the twelve months since it has been completely reorganized and refinanced, the DeForest Radio Company of Jersey City, N. J., has made steady progress in radio tube production and sales, according to its President, James W. Garside.

The company is now operating two huge radio tube plants at Jersey City and Passaic, N. J., with a total of 150,000 square feet of floor space. It carries over 2,000 employees on its payroll. The daily production of tubes passed for shipment exceeds 25,000, and is growing steadily with the installation of special automatic production units.

DIRECT RADIO TO SYRIA

The first direct radio circuit to Beyrout, Syria, from New York just has been placed in operation by R.C.A. Communications, Inc., according to an announcement by W. A. Winterbottom, Vice President in charge of Communications for the company. Messages heretofore have been sent to London or Paris by radio, then by cable to the Syrian capital. Transmission is from the Rocky Point Station on Long Island.

The Condenser Speaker

A Discussion of the Condenser Speaker with Some of Its Problems, and a Description of the Potter Unit

By K. A. HATHAWAY
Associate Editor

MANY of you who will read this article will recall that during the past year you have discussed the condenser speaker with the writer. Some of those discussions have entered into the details to a greater or lesser extent, and always there has been a reluctance on the part of the writer to withold any direct approval or condemnation of the new reproducer.

In this article, the writer is going to disclose some of the opinions he has formed since the condenser speaker first became public property, following a close association with both the Potter speaker and the Kylectron.

A discussion of the subject of reproducers would not be complete without reference to acoustics, for acoustics is the science of sound including the transmission, distribution, and reproduction. Therefore, prior to entering into a description of the speaker, let us consider some of the things that enter into the problem.

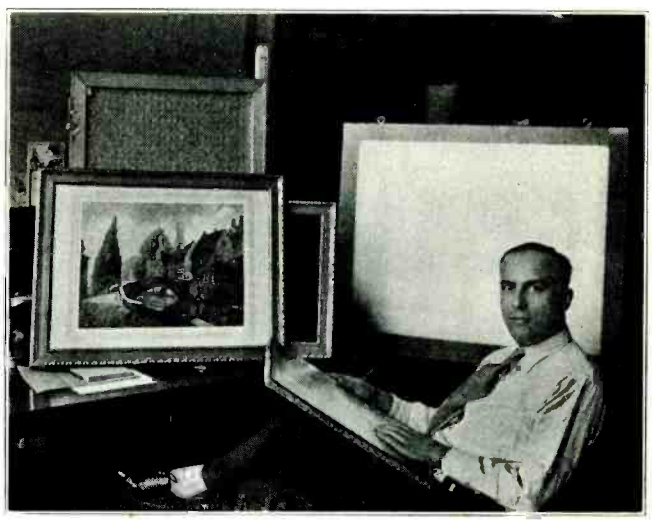
Experiments in acoustic engineering have shown that no two auditory systems are alike in their response to audible frequencies. It has been found that one ear of an individual will respond to certain definite frequencies which the other ear will fail to detect. Therefore, we establish one fact; that no single person is capable of saying that one speaker is either the best or that one reproducer surpasses any other in performance.

Secondly, it is admitted that the reproducers of former years were very erratic; that they failed to reproduce over a wide range of audible frequencies. The public demanded a greater response in the low frequencies with the result that amplifiers were tuned to a low peak, and it has been stated that reproduction is dependent upon the low frequencies for the rounding of the full tone. But, musicians and others acquainted with the tonal ranges differ in their opinion and state that it is the high frequencies that round out the tone and give it brilliance as well as the low frequencies. Hence, we bring out another point, that while a reproducer should cover the entire range of audible frequencies, it should not have a cut-off as low as some of our radio engineers have set as the upper limit.

The manufacturers of reproducers which overaccentuate the low tones are only to be congratulated in that they delivered to the public that which they demanded. However, it would seem that at this late date they, the public, would have learned that overemphasis of low frequencies does not constitute natural reproduction.

A matter which cannot be taken into consideration in the design of a loud speaker is the studio arrangement at the broadcasting station as well as the electrical characteristics of the amplifiers feeding into the modulator system. If a reproducer is connected to a radio receiver tuned to a station whose amplifier is tuned low or where the microphones are erroneously placed so that the base notes are given as great a pick-up as the treble, then the reproduction will consist of a series of "booms" far from natural.

Measurement on meters is considered by many as an indication of speaker action and does show from the standpoint of response just how a speaker will act under varying conditions. Others maintain that the human ear is the only real determining factor of a speaker's fidelity. In the first method the units comprising the testing apparatus must necessarily be calibrated so that the characteristics are known and corrections made for each point on the curve taken, and in the latter method there is the erratic condition of the human ear upon which no dependence can be placed.



Earl Potter, President Potter Manufacturing Co., with several designs of condenser speaker for radio reproduction and home talking movies

Therefore, it seems logical that when the problem is analyzed, the reproducer manufacturers would do no better than to select a representative group of musicians whose ears are tuned to the musical tones and have them indicate whether the dynamic or the condenser type speaker is the one upon which to pin the hopes for natural reproduction.

The Potter speaker which has been designed in the laboratory of Potter Manufacturing company at North Chicago, Illinois, differs from the others that have been introduced in that both plates are vibratory. Different types of plate material as well as different types of dielectric have been tried in an effort to obtain the materials best suited to the need.

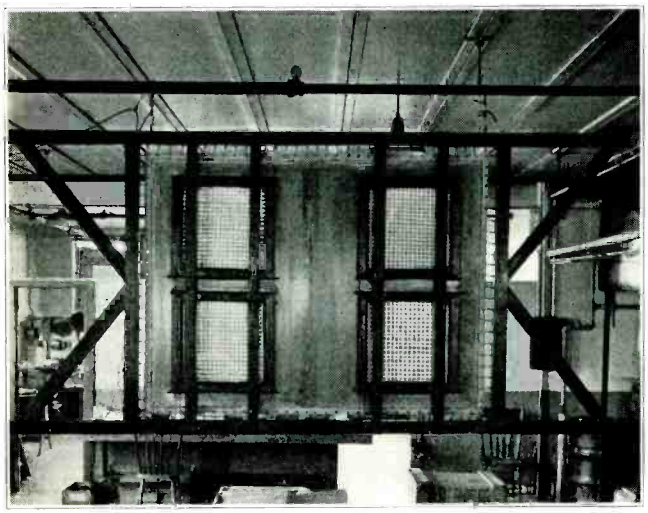
The polarizing charge placed upon the plates is 600 volts so that the speaker must be in effect a condenser capable of withstanding double that value due to the surges as occasioned by the modulated impulses. At the same time the material used for the plate must be capa-

ble of vibrating readily without a vibrating period of its own or one outside the audible range and, too, the dielectric material must have a property of long life.

Potter, as a result of the development in his laboratory, is using a varnished linen dielectric treated with a wax of his own concoction. The front plate is composed of strips of the same foil that is used in the fabrication of condensers, while the rear plate consists of an extremely flexible material simulating tinsel. It actually is silver plated copper strips woven into a cloth with silk thread as a binder.

From the opinion of the writer, the condenser speaker is not without its merits. However, there is no attempt to mould the opinion of others in view of the fact that what might be considered excellent by one would conscientiously be condemned by another. But, there is no getting around the fact that the condenser speaker has improved in many respects within the last few months and there is every indication that it will eventually take its place among the reproducers for radio receiving sets.

At the present time, the condenser speaker is exceptionally well adapted to such uses as public address systems and for reproduction in talking movies. One reason for its adaptability in those two positions may be attributed to the peculiar wave form transmitted from the face of the unit. The broad flat wave form appears not to be disturbed by construction units within a hall that would seriously affect the distribution of the sound waves emitted by other types of reproducers.



Rear view of movie screen designed in Potter Laboratory

As adapted to the talking movies the condenser speaker eliminates one objectionable feature, that of creating the sound at some point other than at the source. In nearly any moving picture house there are certain locations where the sound from the usual type of reproducer placed alongside the screen appears to come not from the point on the screen where the sound would be created but from a point even so far from the screen as to be highly disturbing. In one such moving picture house fitted up as a demonstration room by one of the largest producers of such apparatus the sound appeared to come from the extreme edges of the stage rather than from the screen where at the time of observation a noted singer was appearing. With a condenser speaker directly behind the screen the sound comes from the screen itself.

TREND OF RADIO DEVELOPMENT

A Statement by ALFRED H. GREBE
President, A. H. Grebe and Co.

The trend of technical development in radio is more readily appreciated if a brief review of the past is given.

We have seen the beginning of broadcasting with its few stations of low power and poor transmission qualities requiring sensitive but not necessarily selective or high quality receiving sets.

The great novelty of the situation supported the development of the art safely through this period of miserable performance into the era of excellent transmission which began not earlier than three years ago.

Since that time only has it been really worth while to have a radio receiver which reproduced all tones to great perfection for they simply were not sent out at first from the boadcasting studios.

With perfected broadcasting a reality, a great impetus was given to the refinement of design of audio amplifier and speaker. These advances were correlated to the requirements of the radio amplifier which had to be more selective to meet the increasing number of channels occupied by powerful stations. Unfortunately, the development of selectivity in radio amplifiers has until recently been retarded.

Not so much because of the inability to build selective receivers, but because of the fundamental opposition of a selectivity to perfection in quality, and the fact that with the tubes available until recently a receiver was invariably four to six times as selective at 600 kilometers as at 1400 kilometers. The fundamental deficiency in radio tubes of the 26 and 27 types definitely limited further practical progress toward selectivity—plus high quality in radio amplifiers.

Now this barrier has been swept away by the screen grid tube which lends itself most admirably to the design of radio amplifiers having large overall sensitivity and power yet with a decided improvement in selectivity and still more remarkable ability to preserve the true tone qualities as they are forwarded from the antenna to the audio amplifier system.

We may expect to see the general development of filter circuits, in combination with screen grid tubes and associated coupling circuits having practically "flat" radio characteristics, thus bringing the radio amplifier up to the high level of quality, already achieved in the audio and speaker systems.

Battery sets were generally of a higher quality than the first A.C. sets which were accepted only because of the elimination of battery nuisance. The A.C. set did not attain a position of relatively greater excellence until the dynamic speaker was introduced.

The difference in the past and present steps of development is resolved into this proposition.

Whereas in the past, radical changes in tubes have affected the fundamental design of radio sets and have been accomplished by a sacrifice of some important achievement in the immediately preceding receiving set models, today, tube improvements have brought with them the ability to carry forward the general state of the art as represented in earlier designs as well as the full advantages of the particular improvement in the tube itself.

An Advance in Chicago's Radio History

The Chicago Daily News Formally Opens New Studios on Top of Daily News Plaza

By C. A. DARLING
Editor

THE night of September 17, 1929, marked another step forward in the history of radio broadcasting in Chicago and in the country when station WMAQ, owned and operated by The Chicago Daily News, formally dedicated the group of ultramodern studios on the 25th and 26th floors of the Daily News Plaza. The thousands that attended the dedication and reception were literally astounded to see the extent to which radio broadcasting has progressed in the short period of less than eight years.

In March of 1922, when there were but few radio stations in the country and only one other in Chicago, WGU, owned by The Chicago Daily News and the Fair Store began broadcasting from a home-made 250-watt station. A few weeks after the station began operating The Daily News and the Fair Store, desiring to get into the fore in the broadcasting field placed an order with the Western Electric company for the latest type of 500-watt station and the new station was placed in service early in the fall of 1922. At the same time the call letters were changed to WMAQ which designation it has been kept since that assignment. In the summer of 1923 The Daily News bought the part interest in the station held by the Fair Store and moved the station to the roof of the Hotel LaSalle with studios fitted up on the eighteenth floor.

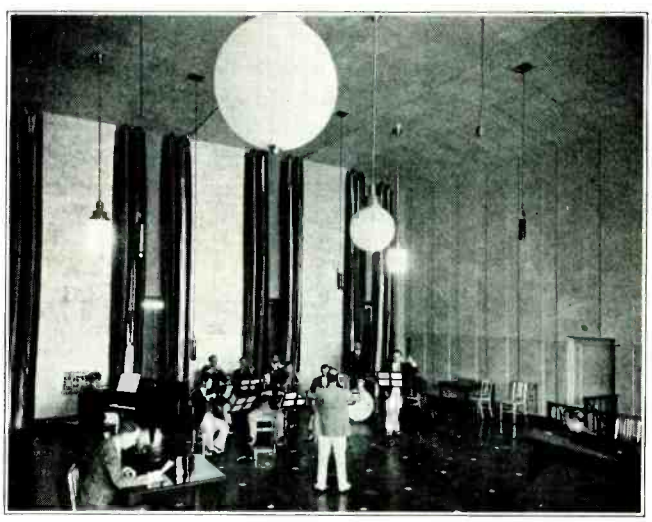
The next step taken by The Daily News was the purchase of a 1000-watt transmitter to replace the 500-watt plant. The new transmitter was installed and placed in operation in the fall of 1924 and the dedication was marked by the fact that for the first time the radio audience listened to a concert broadcast by the Chicago Symphony Orchestra.

In February of 1927 the management of WQJ, which had been sharing the wave length with WMAQ, was taken over by The Daily News, and when the Federal Radio Commission on September 1, 1928, refused to extend the license of WQJ, both stations were operated by The Daily News on a twenty-four hour basis. About the time that WQJ came under the jurisdiction of The Daily News an application was filed for an increase in power and for permission to place the station outside the city. With the permission granted the site near Elmhurst was selected and on June 1, 1928, WMAQ began operating from its fourth station, three of which had been the latest type of Western Electric equipment available at the time of placing the order.

All of which brings us up to the sixth milestone in the history of WMAQ when on the completion of the new Daily News Plaza, the first building to use the air rights over the railroad tracks of Chicago, the seven studios located on the two upper floors of the building were officially put into service. The first use of the studios was on Sunday, August 18, at which time the operators made the switch over from the studios in the Hotel LaSalle over night.

The studios themselves cannot be described by mere words. Elevators go as high as the 24th floor and on passing between two black marble pillars the visitor steps in a corridor at the north end of which is a gold and black staircase topped with an illuminated sign "WMAQ". At the top of the wide stairs the visitor arrives at the studio office presided over by a hostess who greets visitors and takes care of telephone calls from the radio audience.

Seventeen rooms are directly connected to the studio layout. Of these, seven are actual studios or acoustically treated rooms that can be utilized as studios at any time upon instant notice. The remaining ten rooms include the control room, battery room, work room for the operators, store rooms for studio equipment, music files, reception hall, and office space for the force of operators and studio attendants.



Joseph Galliechio directing W. M. A. Q. Staff Orchestra in main studio

Studio "A", is one of the most magnificent broadcasting studios in the world. It is forty feet in width, forty-six feet in length and the height of two floors decorated with an array of blue and silver muroc extending up the walls and across the ceiling from a height of six feet above the floor. There are twenty-one microphone outlets in the studio. Six of them are the ceiling type which may be lowered or raised to suit the requirements. Black and Silver drapes twenty feet long hang at each window and across the window there are accordion pleated shades of a deep blue color. A black rubber tiling with blue insets covers the floor.

The light fixtures are large glass globes supported by heavy silver columns. The globes depict the way in which radio encompasses the earth and were especially manufactured for WMAQ.

There are two concert grand pianos in the studio and the orchestra chairs are made of aluminum with a silver

fabric seat. Arm chairs are also made of aluminum with the silvered upholstering. The doors and interior are fitted with a double thickness of plate glass as is the window overlooking the studio from the 26th floor and the window between studios "A" and "B".

Each of the other studios is finished in a different color and is carefully treated acoustically. In order that they may be equipped for radio development a special studio has been arranged for television. That is located on the 26th floor which is reached from the 25th floor by another wide gold and black stairway.

A reception room for visitors located on the 26th floor where the spectators can gaze through a long plate glass window into studio "A" is heavily carpeted and acoustically treated and equipped with divans and chairs where the visitors may rest while listening to the program furnished to them through a reproducer connected with the monitoring board.

All this is in addition to the space on the 24th floor devoted to the management of the station, the arrangement of the programs, and the dissemination of news of radio in all parts of the world. Miss Judith Waller, director of the station, is one of a few women who have risen high in the field of broadcasting. Miss Hazel Huntley, whose hobby is collecting brass and iron dogs, is program director and supervises the renditions that determines whether or not an aspiring artist has the necessary qualifications to warrant a place on the program.

In addition there is the program production department where programs are outlined and special programs for commercial sale are provided by the staff of continuity writers. The department devoted to the boys and girls, Topsy Turvy Time, has a room in which four young women toil each day to answer requests of the younger generation.

K. A. Hathaway in his Daily News Laboratory

Wm. S. Hedges, a pioneer in radio editorial work, with his corps of assistants occupies a spacious office near that of Miss Waller. Radio editor of The Chicago Daily News, president of the National Association of Broadcasters, and secretary of Press Wireless, Inc. are listed among his titles. Across the hall from the office of the radio editor is the radio laboratory over which K. A. Hathaway, radio technical advisor of The Chicago Daily News and special associate editor of RADIO INDUSTRIES presides. The laboratory is so equipped that products of manufacturers can be thoroughly tested, investigations made, and experimental work conducted. Plans are being formulated for using the new specially designed Bellanca airplane for conducting extensive tests on aircraft radio in addition to the regular line of experimental research in the interest of the entire radio industry.

The Chicago Daily News holds an enviable position in the radio field. It is one of the leading broadcasters and is supported by the whole hearted cooperation of a competent editorial staff whose interest in the radio industry is attested by the fact that for two years the technical representative, K. A. Hathaway, has been delegated to travel through the eastern manufacturing district to obtain first hand information relative to the activities of the industry. He holds the distinction of being the best known radio writer in the country and numbers among his friends and acquaintances personnel of the largest government and commercial laboratories of the country.

TO COMPILE STATISTICS

Estimates as to the number of receiving sets that will be manufactured in 1929 show a wide fluctuation. They range from a low of 3,500,000 to a maximum of 8,000,000. Actual sales, however, are estimated at 2,500,000 to 4,000,000. Accurate figures, so far, have not been obtainable in either case.

The same uncertainty exists as to the actual 1928 figures on production and sales of receivers. Estimates of last year's record of sales range from 2,500,000 to 3,500,000. Here, again, the actual numbers are beclouded by a large variety of wild guesses.

To secure accurate and authentic figures as to sales and production in both 1928 and 1929 the Radio Manufacturers' Association will make a comprehensive survey of production and sales of radio receivers for the past two years.

This statistical review will be undertaken jointly by the Merchandising Committee of which Major Herbert H. Frost is Chairman, and by the Statistics Committee of which George C. Furness is Chairman.

Accurate industrial statistics have long been recognized as invaluable guides for manufacturers in gauging their production and in knowing the actual number of products in use in American homes. That the radio industry and public have lacked authentic information of this type up to date has been due to the comparative youth of the radio industry and the drastic upheavals that have occurred periodically during the period of "incubation."

With the industry now established, however, on a firm foundation, the Radio Manufacturers' Association is planning a number of services which have been impossible to accomplish in the past. The preparation of authentic radio industry statistics is one of these new services.

Radio and the Stock Market

Recent Crash of Prices Should Not Be Felt Greatly by Radio Industry

By Financial Editor

WHAT did it mean to the radio industry when the hysterical wave of liquidation on the New York stock exchange, Oct. 24, 1929, smashed security prices downward in the wildest day of selling ever seen in the history of the United States? The bare facts have long since been recited in every possible form for the benefit of an excited public. The huge trading, amounting to 12,880,900 shares of stock in one day on the New York exchange, to say nothing of the equally wild transactions on a dozen smaller trading floors, set a new record for volume of business, as well as in the breadth of the slump. More than a billion dollars worth of securities changed hands on the big exchange that day. During the hottest of the fray, when the bears were fighting for mastery over the bulls and the public was fighting, with equal frenzy, to unload stocks and get out of the struggle, the rate of trading was 3,000,000 shares an hour.

Besides the main battle on the floor of the New York stock exchange, there were smaller struggles that were epic in themselves. The New York curb saw trading of 6,337,400 shares, a volume in itself almost up to earlier records of the big board, while even the Chicago stock exchange witnessed a turnover of 1,220,000 in the frenzy of liquidation. The worst of the break lasted two days, but volume remained heavy for the rest of the week, as investors changed their holdings to meet new conditions and speculators tried sharp-shooting at issues which had resisted pressure.

Three factors stemmed a route which, had it continued longer, might have had the most serious consequences for the entire country. One influence was the buying. The bears themselves, who having brought about a decline by dumping stocks on the market, were eager to obtain further ammunition by re-purchasing the very issues which they had sold at higher levels. Second to this, although bulking still greater in the public mind, was a banking conference at the offices of J. P. Morgan & Co. in New York, which resulted in plans to stem the selling wave. Third was actual buying for investment on the part of many thousands of people of moderate means all over the country. Whether such investment was altogether wise or not, it certainly was wiser than buying at the top. When the dust settled, the stock market, while still subject to other, and minor, reactions, had settled down to a fairly even gait. So much for the event. What about its meaning?

First among the effects of any violent break in the stock market is its bearing on the ability of various industries to raise new capital as needed. In this respect, the radio group have been little damaged, and such difficulty in raising capital as may be experienced, besides being minimized, comes at a time when it is rather an asset than a liability to those concerns which are already established. Radio Corporation of America, in sliding down from 114¾ to 44½, and finally stabilizing around the middle 50s, has not harmed the rest of the industry. Kolster, at 12 instead of 78¾, Grigsby at 40 instead of 69¾, would find it more difficult to raise capital through stock sales, but with reasonable conservatism they should be able to finance themselves out of earnings to some extent, as the automobile industry did so much of the time in its years of early progress.

As an offset to low stock prices, there is the very evident improvement in the bond market, an improvement which seems destined to continue for some time as interest rates drift lower. For the public to plunge back into speculative excesses after such an experience as that just concluded, would be to argue that people could not learn from experience. If interest in stocks does not become excessive as immediate fear dies out, there will be plenty of money left for other credit purposes. Under such conditions, with the federal reserve lowering rates in order to keep in line instead of raising them in apprehension, we should have, while not low money rates, rates of interest that are decidedly reasonable in comparison with those in effect recently.

If time money returns to 5 per cent, and good bonds can be sold on a basis to yield, say 5½ per cent to maturity, the radio industry may be able to finance expansion of plants, when or as needed, on an even more satisfactory basis than through the stock market. Such a change is not predicted, but the probable trend is very strongly in that direction. In fact, a better bond market has been held back only because of the lack of confidence of the public in many of the bond issues which have been floated. A return of such confidence is almost inevitable, as sterling worth reaches its reward, and with public confidence the rate on long term bonds ought to be less costly to the average company than the rate on temporary short term accommodation.

But, besides the need to finance the radio industry, there is the need for financing radio purchases. After all, the basis of the sales volume of the manufacturer is the prosperity of the individual customer. And this prosperity has been hard hit during the market break.

In the downswing of the last few months, it was a rare stock that did not lose more than 10 per cent of its value, while many suffered far greater declines. Of course, the only actual losses, in cash, came to margin traders who were sold out in the market. But even those whose stocks were laid away in safe deposit boxes had a smaller potential fortune than they had before. If the total value of stocks is estimated at around $80,000,000,000, which is not an unreasonable figure, the paper loss in the last break must have been at least $10,000,000,000 and perhaps as much as $14,000,000,000.

In other years and other ages, such a loss would have set everybody in America to going around in old clothes and half-soled shoes. Factories would have closed for lack of customers, leading to reduced wages and in turn cutting down the available income. But the present era

is vastly different from those which have gone before. Modern machinery, modern invention, even modern methods of distributing merchandise, have increased the wealth-producing power of the United States to an unbelievable extent. In the area immediately surrounding Chicago, there are four big concerns which have been adopting improved methods steadily during the last quarter-century. They are United States Steel, Western Electric, International Harvester and Standard Oil of Indiana. The goods produced by these organizations, if handled by the methods of a generation ago, would involve an excess cost of $135,000,000 a year.

This country, to-day, has an income which must be close to $90,000,000,000 a year. Financial houses, in estimating the ability of the public to absorb new issues, place our saving power at $14,000,000,000 a year. Merchandising experts, in calculating the spread of chain stores or installment selling, usually calculate retail sales in the United States somewhere between $40,000,000,000 and $60,000,000,000 a year. Yet statistical experts, combining the physical wealth of the country with its financial resources, arrive at a total wealth of some $500,000,000,000 at the most a figure on which our expanding earnings will shortly be bringing in a return of some 20 per cent.

Clearly then in proportion to national income, a good deal of the property of every kind in this country must be decidedly undervalued. If this is true, and the fact that merchandise prices are fairly low and inventories not excessive tends to give it weight, the tremendous drop in the stock market is only a sort of superficial ripple on the surface. Less than one-fifth of the wealth of the country is represented by stocks, if this computation is correct, and if stocks drop and money becomes available for other purposes, many forms of property may see an advance in values comparable to the stock boom just concluded.

Another influence which tends to prevent hard times is that many of the losses in the market represented little more than paper profits. The owners of stocks had not been spending profits; on the contrary, they had been using their savings to buy more stocks, and being turned away from the stock market, may well have more money to spend for other purposes. All in all, we have seen the puncture of a growing balloon which was so huge that it was unbalancing the entire financial system of the country. Stocks will rise again, after a time, but in the meantime, there is no reason for expecting anything more than a temporary check to profitable business which our general national prosperity justifies.

RADIO IN EDUCATION

With the beginning of the Fall school term the radio loud-speaker has taken its place beside the blackboard as an aid to teaching. According to Quinton Adams, Vice-President of the Radio-Victor Corporation of America, twenty schools in various parts of the country have begun the new term equipped with centralized radio apparatus for the distribution of educational programs to the classrooms and between sixty and seventy other schools are planning similar installations. Every school year brings an extension of education by radio.

ALEXANDERSON PATENTS UPHELD

A radiogram was received from London today stating that a decision had been handed down by the Privy Council, the highest appellate tribunal in the British Empire, upholding the Alexanderson tuned radio frequency patent as against the Schloemilch and von Brönk patent.

The case went to the Privy Council in London on appeal from the decision of the Supreme Court in Canada. In the Canadian litigation, the Alexanderson patent was sustained by the lower court. This decision was reversed by the Supreme Court of Canada after which jurisdiction of the controversy was taken by the Privy Council.

The two patents had already been considered by two Federal Courts of the United States both of which had decided in favor of the Alexanderson patent.

The validity of the Alexanderson patent was the subject of testimony offered before the Senate Interstate Commerce Committee last May during its hearings on the Couzens bill for the creation of a Federal Communications Commission.

Colonel J. I. McMullen, in charge of patent work in the office of the Judge Advocate General of the War Department, was the witness on this occasion.

He testified that the American litigation involving the two patents had been conducted "in a sort of left handed way, and the Alexanderson patent was given priority over the Schloemilch and von Brönk patent."

Colonel McMullen said he did not think that the government had intervened in the case and that it was his opinion that in this litigation nobody represented the von Brönk patent.

The government, the witness explained, had seized the Schloemilch and von Brönk patent immediately succeeding the armistice.

In a letter written to members of the Senate Interstate Commerce Committee, following this hearing, Colonel Manton Davis, vice president and general attorney of the Radio Corporation, pointed out that the United States District Court for the eastern district of New Jersey had been the scene of a vigorously contested suit involving the questions of priority between the two patents.

Colonel Davis's letter brought out the fact that in this suit the United States Department of Justice had filed a brief on behalf of the von Brönk patent as a friend of the court, thus contradicting the testimony of Colonel McMullen that the government made no effort to establish the von Brönk as against the Alexanderson patent. The New Jersey case was decided in the summer of 1926 in favor of the Alexanderson invention.

A similar case, which was also brought to a conclusion in favor of the Alexanderson patent in the United States District Court for the southern district of New York the following year, was cited by Colonel Davis in this letter to members of the senate committee.

The Radio Corporation attorney brought out that this suit was defended by one of the great American radio manufacturers in an effort to defeat the Alexanderson patent.

Referring to the decision of the Privy Council, Colonel Davis stated this morning:

"The decision just handed down in London is a complete and final answer to strong propaganda which has been asserting that the R.C.A. licenses to radio set manufacturers were not supported by substantial and basic radio patents."

Tailor-made Sound Reproducing Systems for Theatres

Most Every Theatre, Hall or Auditorium Presents an Individual Acoustical Problem

By LUDWIG ARNSON, V. P.
Radio Receptor Company

BACK in the early days of radio reception, when adventurous radio fans were forsaking the crystal for the vacuum-tube detector, selection was a compartively simple matter. There was no such thing as a 201-A, 245 or 224 vacuum tube. The proud purchaser would simply say, "Give me a vacuum tube," and after six or seven dollars had changed hands, would walk out with that Aladdin's Lamp representing the acme of radio perfection. And the writer fears this condition or frame of mind exists even today in the matter of talking movie theatre equipment.

The average moving picture theatre owner seems to believe that it is simply a matter of "Send me up a sound outfit", and his troubles are over. Far from it—they are just beginning.

It is an actual fact that of all the theatres, auditoriums and other public places in existence, only about 20 per cent are really ready for the immediate installation of a sound-reproducing system without adjustments of any sort. The remaining 80 per cent hold in store just about every acoustic problem imaginable. And each one of these problems requires special treatment of its own. In other words, just as much care is necessary to "tailor" the installation to fit the theatre, as is required to tailor the goods to fit the "stylish stout."

We were recently called upon to assist a figurative "stylish stout" in upper New York State, whose requirements were delicate in the extreme. This particular theatre was afflicted with dead spots or areas, not necessarily far from the sound source, where practically nothing could be heard. Farther back in the theatre, reception was excellent, as it was to the front and sides. The trouble was diagnosed in this case as conflicting sound waves. A train of sound waves coming directly from the stage, encountered another train of waves deflected straight down from the ceiling. Where the two met they counteracted or neutralized each other to such an extent that practically nothing could be distinguished. The remedy in this case was found in the medium of distribution, that is to say, in the use of directional speakers. The usual cone speakers were discarded and a number of specially designed horns were substituted. These horns, equipped with the best obtainable reproducer units, were placed at different angles and their relative positions varied until the ideal degree of reproduction was achieved. In this way we actually made the sound waves behave, directing them the way we wanted, to overcome the natural defects of the theatre. The results of this tailoring are readily apparent today in the quality of reproduction enjoyed in this theatre—a quality that would lead one to believe that the theatre had been built just for this purpose.

Another effect encountered in some theatres is not so much a problem as an advantage, although it may cost the owner just as much in the long run. We know, and the informed manager knows, approximately what quality of apparatus is necessary for a given space to be covered. It sometimes happens that the manager, without consulting the installation specialist, orders what would seem to be the necessary equipment, and finds to his disgust that his reproduction is too powerful. The reason is that some theatres are so acoustically perfect that only 50 per cent of the energy is necessary to fill them as would be required for a theatre of the same size that was not acoustically sound. The aforementioned manager finds that the size of his installation far exceeds the demands of the theatre, and he is consequently obliged to operate at greatly reduced power. This means that he has spent twice as much as was necessary on the original installation, and is probably wasting 50 per cent of his power bill in unnecessary upkeep. A little tailoring here would have saved a good deal of cloth.

It should not be deduced from this that theatre owners are "boneheads". Far from it. There still remain, unfortunately, certain elemental factors that cannot be overcome with ease, for instance, what may appear to be a lack of synchronism between screen subject and sound; that is to say, the ear may subsconsciously detect a fraction of a second difference between the movement of the actor's lips and the reception of his voice. This is not a technical defect but a perfectly natural law that governs the difference between the speed of light and the speed of sound. Now light is practically instantaneous, so that the man sitting in the farthermost row of one of our great theatres, actually sees the image on the screen at the exact instant that it appears on this screen, while the sound, coming the entire length of the theatre, strikes his ear a fraction of a second later. The natural reaction to this is to wonder why loud-speakers could not be placed in all the different parts of the theatre. However, a careful analysis of this suggestion will make the drawbacks self-explanatory. A cure of this kind would be worse than the original ill, due just to this very time lag. The spectator in the far row would hear the sound at exactly the same time that he would see the image, it is true, but, a fraction of a second later he would hear this same sound coming up from one of the speakers located in the front of the house. The result would be a fuzzy or blurred sound to every one in the house, as the spectator down front would also hear the response from the speaker located at the back of the house, as well as the speaker nearby.

Some of these minor details are really beyond the control of the theatre owner.

AMONG THE LEADERS

Wm. P. Mackle, Manager of the St. Louis Radio Show, reports attendance of 124,345 for this year's show.

* *

The right to use high vacuum in its audions has been granted the De Forest Radio Company by the Court of Appeals after a suit for patent infringement was instituted by the General Electric Company.

* *

C. R. Leutz, Inc. have moved their plant from Long Island City to Altoona, Penn.

* *

Alfred H. Morton, Commercial Manager of R.C.A. Communications, Inc. has been made European Manager of R.C.A. with offices in Paris.

* *

The DOX Dornier giant trans-Atlantic air liner will be Freed Radio equipped according to announcement.

* *

Each week, over the air, Westinghouse will dedicate its program to an individual industry for the purpose of building good will among the various industries in which its products are utilized.

* *

Jack Dalton, eastern representative for Crosley, visited the plant at Cincinnati last month.

* *

With this issue *Radio Industries* adds the various allied divisions of radio.

* *

Otto N. Frankfort, Vice President in Charge of Sales of the All-American Mohawk Corporation is personally directing a sales contest which includes 18,000 Lyric dealers salesmen and which ends December 14.

* *

A. Atwater Kent won the praises of many bed ridden patients last month when he donated several radio sets to hospitals.

* *

From Crosley-Amrad salesman to announcer for the National Broadcasting Company is a step just taken by Henry W. Butterworth of Philadelphia.

* *

85% of all radio sets are sold to women according to A. A. Schneiderhahn, Atwater Kent distributor in Iowa.

* *

Television, Sound Projection, Radio Communications and Aeronautical Radio application will be included in the future editorial columns of *Radio Industries.*

* *

W. D. Powers is the new merchandise manager of CeCo Manufacturing Company, Inc.

* *

Ray Thomas, Atwater Kent distributor of Los Angeles, reached recent distributors convention in Philadelphia via air in 48 hours.

* *

Talkies, and music from films, will be common in the American home within the year according to A. J. Carter, President of Carter Radio Company.

Charging infringement of its patent which broadly covers the method of manufacturing paper condensers, Dubilier Condenser Corporation have instituted action against the Aerovox Manufacturing Corporation.

* *

As *Radio Industries* sees it, the time will come when a railway engine will be started and its operations fully controlled by radio.

* *

Radio Industries will continue to be edited exclusively for the manufacturer.

* *

A. D. Strathy, sales manager for the Cable Radio Tube Corp., announces the appointment of C. M. McIntosh as west coast manager.

* *

George M. Cook has been named head of the newly created public relations department of the Grigsby-Grunow Company.

* *

Westark Radio Stores, Inc. now operate 48 retail stores throughout the country and plan to double this number within the next few months.

* *

Harry C. Holmes, well known radio tube sales manager, has resigned his position as director of sales of the De Forest Radio Company.

* *

J. M. Troxel of Fansteel Products Company, Inc. is returning from an European business trip this month.

* *

The subscription price of *Radio Industries* is $3.00 annually but those with a bent for economy can save a dollar by subscribing for two years at $5.00.

* *

Paul Stauffer, well known in the copper wire industry, has been made Eastern Manager for the Inca Manufacturing Corporation with headquarters at Newark, N. J.

* *

Byron B. Minium, Chief Radio Engineer of Stewart-Warner, has resigned to accept a similar position with the Baldwin Piano Company at Cincinnati.

* *

H. E. Capehart, President of the Capehart Corporation of Fort Wayne, reported a sale of 10,000 units during the first day of the Chicago Radio Show.

* *

R. A. Connor for many years associated with Mr. George A. Jacobs, has joined the sales and engineering staff of the Inca Manufacturing Corporation with headquarters at Fort Wayne.

* *

Powel Crosley, Jr. believes that there is a market for six million screen grid battery receivers in the United States.

* *

Taylor C. White has been named Seattle Branch Manager for the Edison Distributing Corporation.

* *

The Radio Wholesalers Association has recently accepted the following as members: Geo. H. Wahn Company, Boston, Mass. Electric Equipment Co., Youngstown, Ohio., J. V. Kane Company, Philadelphia, Pa.

NEWS OF THE INDUSTRY

Our readers are interested in live news of the industry

BROOKS WITH TEMPLE

Mr. W. A. Brooks who for the last seven years has been connected with the Timken Roller Bearing Co., Canton, Ohio, as assistant secretary-treasurer, has just been appointed assistant to Alfred Marchev, president and general manager of the Temple Corporation, local radio manufacturing concern, and in that capacity will take over part of the heavy work and responsibility now on Mr. Marchev's shoulders.

Mr. Brooks is a graduate of the University of Pennsylvania. In addition to his work with the Timken Co., Mr. Brooks was connected for several years with a Detroit automobile company, as secretary-treasurer and with the E. I. Du Pont de Nemours Co., Wilmington, Delaware and Philadelphia.

■

RADIO ACCOUNT TO HAZARD AGENCY

The Shortwave & Television Laboratory, Inc., Boston, radio receivers and television apparatus, has appointed the Hazard Advertising Corporation, New York, to direct its advertising account.

■

ELECTRICAL EQUIPMENT ACCOUNT TO R. D. WYLY

Hardwick, Hindle, Inc., Newark, N. J., electrical and radio equipment, has appointed R. D. Wyly, Inc., Washington, D. C., advertising agency, to direct the advertising of its resistors. Business papers and direct mail will be used.

WITH GENERAL MOTORS RADIO

Edward B. Newill, of Forest Hills, has resigned as manager of the Control Engineering Department of the Westinghouse Electric and Manufacturing Company to become affiliated in an executive capacity with the radio manufacturing company being formed jointly by the General Motors Corporation and the Radio Corporation of America. Mr. Newill entered upon his new position October 16, under the title of assistant to the president of Delco Products Company, with temporary headquarters at Dayton, Ohio. When organization of the new radio company is consummated, Mr. Newill will be assigned executive duties in connection with either engineering or manufacturing.

Mr. Newill graduated with the class of 1915 from Georgia School of Technology. He enrolled in the Westinghouse graduate student course, and has been employed by that company continuously since.

■

NEW RADIO COMPANY APPOINTS CHAS. DALLAS REACH

The Radio Products Corporation, has been formed through a merger of the Vacuum Tube Products Company, Hoboken, N. J., and the Schulz Machine Company, Newark, N. J. Its headquarters will be at Newark.

The new company has appointed Chas. Dallas Reach, Newark advertising agency, to direct its advertising account. Business papers and direct mail will be used.

MADE SALES MANAGER

Harold J. Wrape, president, Trav-Ler Manufacturing Corporation, has announced the appointment of F. J. Bullivant as sales manager of the company. Mr. Bullivant in assuming his new duties will retain active charge of the sales department of the B-L Electric Manufacturing Company, builders of rectifying devices. The majority interest in this latter company is also held by Mr. Wrape.

The new sales head of the Trav-Ler organization has been actively identified with the radio industry for the past eight years, joining the B-L and Trav-Ler organizations after being for eight years with the Valley Electric Company of this city. Mr. Bullivant was chief engineer for the Valley company.

Prior to his connection with the Valley company he was with the Wagner Electric Company also of St. Louis, holding positions in both the sales and engineering departments.

■

SILVER IN ACCIDENT

McMurdo Silver, president of Silver-Marshall, Inc. of Chicago, manufacturers of Silver radios and prominent in the parts business, was seriously injured in an automobile accident recently.

Mr. Silver was driving to the home of his mother in Geneva, one of the western suburbs, when the accident occurred. Reports indicate he was forced off the road in an attempt to avoid a serious collision. His machine turned over, and Mr. Silver received a skull fracture. He was taken to a hospital where at first his life was despaired of, but his youthful vitality brought about a quick come-back.

EDISON OUT-STANDING DISPLAY AT RADIO SHOWS

The four golden-haired attendants who greeted visitors to the Edison Radio Displays at the New York and Chicago Radio Shows. Gold trimmings were the keynote of the whole display in commemoration of Mr. Edison's contributions to science and civilization during the past fifty years.

WESTINGHOUSE ELECTS VICE PRESIDENT

At a recent directors' meeting, J. S. Tritle, in charge of manufacturing operations of the Westinghouse Electric & Manufacturing Company, was made a vice-president. A native of Nevada and a Yale graduate, Tritle has been an outstanding figure in the electrical industry since 1893. After managing the Kansas City and St. Louis district sales offces for a number of years, in 1922 he was made manager of the merchandising department, supervising the sales of that department's products, including, primarily, household electrical appliances. In 1925 he assumed full charge of the engineering and manufacturing as well as sales work of the merchandising division, with headquarters at Mansfield, Ohio.

On May 1, 1929, when Vice President H. P. Davis was assigned to devote his entire time to the rapidly-growing activities of the company in the radio field, J. S. Tritle assumed responsibility and authority for manufacturing operations of the entire company.

Mr. Tritle was born in Virginia City, Nevada, in 1872. He received his early schooling in New Haven, Conn., to which his parents had removed in his early youth. From preparatory school Mr. Tritle entered Yale University from which he was graduated in 1893 with a degree in science.

■

HENRY C. BROWN DIES

Widely known in advertising circles and a former executive of the Victor Talking Machine Company, Henry C. Brown of Merion, Pa., died of heart disease in the Bryn Mawr Hospital on October 16. He was 66 years of age.

For many years Mr. Brown headed the advertising activities of Victor and was the originator of that company's house organ "The Voice of Victor". In 1924 he resigned his position and organized the Henry C. Brown Advertising Company.

ADDS REFRIGERATION

Ayers-Lyon Corporation of Boston, radio and electrical sales representatives in the New England territory, have just added the Copeland line of refrigeration. It is anticipated that this will serve as a profitable adjunct to lines already carried by radio and electrical dealers contacted by the Ayers-Lyon organization.

■

FATHER OF RADIO HONORED

After due consideration, the Aurelian Honor Society of the Sheffield Scientific School (Yale), has offered an election to honorary membership to Dr. Lee DeForest, the inventor of the audion or present-day vacuum tube, and the acknowledged father of radio. The offer has been accepted, and Dr. DeForest will accordingly attend the initiation exercises on November 12th, at New Haven, Conn.

An alumnus of the Sheffield Scientific School, from which he graduated with the degree of B. S. in 1896, followed by his Ph.D. in 1899 and D.Sc. in 1926 from Yale, Dr. DeForest will be quite at home in the Aurelian Honor Society of his alma mater.

■

ELECTRAD ELECTS

In recognition of their conscientious services to Electrad, Inc., the Board of Directors have elected Henry G. Richter, Vice-President in charge of Engineering and Edward Metzger, Vice-President and General Manager in charge of Credits, General Office and Factory Supervision. This information was contained in a letter just received from Arthur Moss, President of the firm.

■

CROSLEY TO CRUISE

Powel Crosley, Jr., radio manufacturer and sportsman, expects to find recreation during November and December by cruising down the Ohio and Mississippi rivers on the Moonbeam, his new 46-foot Matthews power cruiser. The boat eventually will be taken to Sarasota, Fla., where Mr. Crosley's winter residence is located.

■

BRECK ADVANCED

Announcement is made by the Kolster Radio Corporation that L. T. Breck, who has been sales manager of the organization for the past year, has been elected Vice-President in charge of the Merchandising Division to succeed Major Herbert H. Frost, who recently resigned. Mr. Breck will assume his new duties at once.

■

STEINITE ADDS TO FORCE

A payroll numbering 3,000 employees now is the Steinite Radio Company's contribution to the Fort Wayne, Indiana, manufacturing wealth.

The factory force has been increased by the addition of 500 weekly for the last three weeks, according to an announcement by Lester Abelson, general production manager.

CITY REWARDED

A debt of gratitude to the citizens of Jackson, Michigan, has just been announced by Capt. William Sparks, President of The Sparks-Withington Company with the establishment of a trust fund of 87,000 shares of industrial stock and the inclusion with it of 450 acres of property on the outskirts of Jackson. In making the presentation, Capt. Sparks announced that the endowment enterprise, to be known as the William and Matilda Sparks Foundation, was given to the city of Jackson as a token of his appreciation toward the citizens and business men who made his success possible.

With the 450 acres of land, a detailed plan of beautification and improvement has been worked out by Captain and Mrs.

Sparks, in cooperation with landscape architects. A magnificent observation tower on a prominent hilltop will be the central feature. A formal amphitheatre will provide a classic setting for pageants, outdoor drama and similar spectacles. There will be an 18-hole championship length golf course. The entire tract will be traversed by an elaborate system of lagoons, pools and cascades.

■

E. L. HADLEY WITH GRIGSBY-GRUNOW

Earl L. Hadley, formerly advertising manager of the Cable Company, Chicago piano manufacturer, has joined the sales promotion department of the Grigsby-Grunow Company, Chicago, manufacturer of Majestic radios.

■

AUTOMOBILE RADIO CORPORATION ELECTS G. A. RICHARDS

G. A. Richards, formerly representative of the manufacturers' sales department of the Firestone Tire & Rubber Company, at Detroit, has been elected vice-president of the Automobile Radio Corporation, in charge of manufacturers' sale of the Transitone auto radio, headquartering at Detroit.

BUSINESS TOPICS

75% of All Radio Sets and Equipment Used Throughout the World is Made in the U. S.

GENERAL MOTORS RADIO CORP. ORGANIZED

To introduce radio as optional equipment on motor cars will be one of the first jobs for the General Motors Radio Corporation, organized several weeks ago by General Motors Corporation, in conjunction with the Radio Corporation of America, General Electric Company and Westinghouse Electric & Manufacturing Company. In a joint announcement by Alfred P. Sloan, Jr., president of General Motors, and David Sarnoff, executive vice-president of Radio, tentative plans were announced for the entrance of the motor company into the radio business in a "large way."

The corporation is headed by John Thomas Smith, vice-president and general counsel of General Motors, chairman, and R. J. Emmert, for a number of years an executive in the starting, lighting and ignition branches of General Motors, at Dayton, president.

"A new corporation, to be called General Motors Radio Corporation, has been organized with a capital stock of $10,000,000 preferred and 1,000,000 common shares of no par value," the statement said. "The Radio group is to contribute $4,900,000 in cash and to grant licenses under all their patents covering radio sound and picture receiving and reproducing sets for use in homes and automotive vehicles. General Motors is to subscribe $5,100,000 in cash and to assume the management.

Not only do we believe that there is a great opportunity for the development of the radio business as an adjunct to the automobile, but the radio field in general is one that is closely related to the automobile and electric appliance business in which the General Motors is engaged.

"The Radio Corporation will continue independently, as heretofore, both as to the manufacture and distribution of its products, and the General Motors Radio Corporation will develop its business along separate lines."

Speaking for the General Motors Corporation, Mr. Sloan said:

"New Cadillac and LaSalle cars have been designed for radio installation and thousands of installations have already been contracted for by dealers. As quickly as possible the same facilities will be available for other makes of General Motors cars."

Headquarters are expected to be at Dayton.

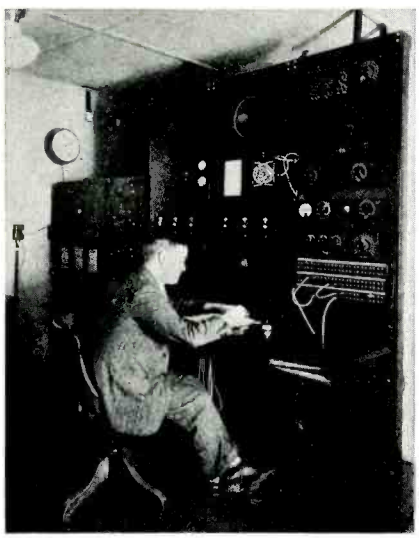
■

KDKA SHORT WAVE STATION

The listening post of station KDKA would be a dyed-in-the-wool radio fan's idea of Heaven. There, seated before three of the finest short wave receiving sets that engineers of the Westinghouse Electric and Manufacturing Company are able to build, he could listen to the high frequency stations of the world.

Holland, England, Australia, Java and other widely separated spots of the globe would all be within the reach of his delicately-tuned receivers. A polygot program would be heard. He would need to be a talented linguist to understand all he heard.

The present short wave receiving station of the Westinghouse Company is located on the William Penn Highway a short distance



Harold Roess, operator of the short wave receiving station of KDKA, is seated before the three sets which form the nucleus of the "listening post". On the left is a standard set. Directly before Mr. Roess are the two sets built specially for the station. The microphone can be used during experimental operations.

out of Pittsburgh and several miles from the KDKA transmitter in East Pittsburgh. It was established in 1928, although Westinghouse had done much short wave receiving work before that time. The small building that houses the sets, battery equipment and other necessary apparatus was erected in the fall of 1928 and checking of foreign stations began in October.

All the world has heard of some of the exploits engineered through this little station. Big Ben, the famous Westminister clock, has sent its deep tones to America via the short wave station and the KDKA transmitter. Holland, Germany and Australia have sent programs to the station which have been repeated for American listeners.

As the accompanying photograph shows, the KDKA listening post is equipped with three receiving sets. Two of them were built especially for the station. The other is of a type manufactured for the Government. The two special sets are so arranged that they can be hooked together and their incoming signals combines. At the same time the two are connected to different antenna sets. In this way, when the signal is fading on one set it may be full strength on the other. This makes possible more even reception.

Each set operates its own dynamic speaker. When the two sets which are used jointly have been tuned in satisfactorily their output is switched to a single speaker.

In addition to having three receiving sets the station has three separate antenna sets. Two are directional; that is, they will receive signals coming from only one direction. The other is a vertical non-directional antenna, of a type evolved by the Westinghouse Company in the early days of short wave work.

The two directional antenna sets are huge networks of wire suspended from wooden poles. The larger is 300 feet long by 80 feet wide and is hung 60 feet above the ground; the smaller is 150 feet long and 50 feet wide and is 20 feet above the ground. They are pointed toward England, Germany, Holland and Italy in a Great Circle route. In other words, the direction is Northeast across Newfoundland.

So well do these sets carry out the intentions of their designers that they will not receive signals efficiently from Canada despite the nearness of stations there. Signals from Commander Richard E. Byrd's camp in the Antarctic are received through the vertical antenna.

■

REMOTE CONTROL FOR LIGHTING AIRWAYS

To Wm. Earle Stilwell, Jr. a Cincinnati inventor, may go the credit of solving a problem that has long puzzled students of aeronautical lighting—that of controlling airport lights—landing lights—beacon lights and emergency lights from a plane in flight.

Mr. Stillwel's device operates simply thru a radio transmitter—the aviator can easily turn lights off or on as he passes them in flight or in flooding the field when he is landing. The principle of the invention is also simple in operation making it foolproof. Each airport is on a designated low wave length and a properly coded log book with the wave lengths of each airport is all that is necessary to insure safety in cross country night flying.

LESQUIER FLIES TO MINNEAPOLIS

During a recent tour of inspection upon which he made first hand contacts with distributors and dealers and gained special information for Bosch Radio Better Business Bulletin No. 7 on the subject of credit, Mr. Edmund O. Lesquier, General Credit Manager of the American Bosch Magneto Corporation, in company with Herbert Shoemaker, Chicago Sales Manager, boarded one of the huge tri-motored airplanes at Chicago and flew to Minneapolis.

Mr. Lesquier has just completed a tour touching St. Louis, Kansas City, Minneapolis, St. Paul, Milwaukee, Chicago, Detroit, Cleveland, Pittsburgh and Buffalo.

■

NAILING A RUMOR

A. Atwater Kent, president of the Atwater Kent Manufacturing Company, recently issued the following statement:—

"Varied rumors would seem afloat that I am contemplating a merger with one, or another or several radio manufacturing concerns.

"Once and for all, I wish to state that there is absolutely no basis whatsoever for these reports. I have conducted my own business for more than twenty-five years and I contemplate no change in my policy.

"I have a fine organization. I enjoy managing my factory and nothing has occurred that would lead me even to consider joining forces with any other company."

(A story concerning the possible merging of Atwater Kent, Grigsby-Grunow and Crosley appeared in the daily press on October 10th.)

■

FENNER TO SOUTH AMERICA

Mr. Herbert E. Fenner, General Service Manager of the American Bosch Magneto Corporation at Springfield, Massachusetts, has sailed from New York to make an extended tour of inspection of all the principal cities, and many smaller centers, in the countries of South America.

COMPILING NUMBER WIRED HOUSES

According to figures issued by the Department of Commerce, there are approximately 28,000,000 homes in the United States, of which some 18,500,000 are wired for electricity.

These have been broken down into the number of wired homes in each State, but so far, no accurate knowledge is available of the number of wired homes by counties.

To insure the public the fullest possible benefits of the most modern A. C. radio receivers, the Merchandising Department of the Radio Manufacturers Association is embarking upon an investigation to ascertain the number of wired homes in each county in every State in the Union.

This information, it is expected, will prove of immense value not only to radio set manufacturers in the distribution of the latest electric radio receivers, but also to local municipal authorities, who themselves, do not know accurately the number of homes wired for electricity in their respective territories.

Up to the present, it has been possible to obtain only the number of wired homes State by State. The latest estimates of these figures, computed by the R. M. A. Merchandising Division, are as follows:

State	No. of Wired Homes
Alabama	137,000
Arizona	36,500
Arkansas	111,000
California	1,400,000
Colorado	175,000
Connecticut	346,500
Delaware	28,500
District of Columbia	107,000
Florida	139,000
Georgia	136,500
Idaho	67,000
Illinois	1,535,000
Indiana	540,000
Iowa	339,500
Kansas	283,500
Kentucky	186,000
Louisiana	106,500
Maine	131,500
Maryland	251,000
Massachusetts	898,500
Michigan	896,000
Minnesota	389,500
Mississippi	53,000
Missouri	565,000
Montana	68,500
Nebraska	178,000
Nevada	14,000
New Hampshire	97,000
New Jersey	810,000
New Mexico	23,500
New York	2,829,000
North Carolina	172,500
North Dakota	51,000
Ohio	1,280,000
Oklahoma	178,500
Oregon	193,000
Pennsylvania	1,480,000
Rhode Island	141,500
South Carolina	97,000
South Dakota	55,500
Tennessee	169,500
Texas	495,000
Utah	106,500
Vermont	61,000
Virginia	176,000
Washington	355,000
West Virginia	128,000
Wisconsin	471,500
Wyoming	31,500
Total Wired Homes in U. S. (Approx.)	18,500,000

Some idea of the magnitude of the survey to be undertaken may be obtained when it is realized that there are over 3,075 counties in the forty-eight states.

The results of the survey, when completed, will be made available to the trade and public, according to Major Herbert H. Frost, Chairman of the R. M. A. Merchandising Committee, under whose direction the survey will be made.

■

DEFOREST ACQUIRES JENKINS TELEVISION SHARES

Following a meeting of the Board of the DeForest Radio Company, James W. Garside, President, announced that the No Par Capital Stock of the company had been increased 345,680 shares through the exchange of DeForest Common Stock for that of Jenkins Television. The exchange was on the basis of one No Par Common share of DeForest Radio for each 1¾ No Par Common shares of Jenkins Television. The offer of exchange expired Friday, Oct. 18, 1929.

With 984,652 shares of DeForest previously outstanding and the additional 345,680 shares through the exchange, the total stock of DeForest Radio authorized to be outstanding is now 1,330,332 shares. Application for listing the additional shares has been made to the New York Curb and the Los Angeles Stock Exchange.

Mr. Garside also announced the election of Kelly Graham, President of the First National Bank of Jersey City, to the Board of the DeForest Company.

■

CHURCH INSTALLATION

Announcement comes from Ludwig Arnson, Vice-President of the Radio Receptor Company of New York City, that a complete Powerizer installation has just been completed in the First Christian Science Church of Binghampton, N. Y. The sound pickup installation includes three microphones, namely, one located near the organ, one near the choir, and one in the pulpit. The amplifying system includes a mixing panel, a microphone amplifier and a PXP 250 Powerizer power amplifier, the entire assembly being mounted on a single rack. Sound distribution is attained through six dynamic speakers located throughout the church.

LETTERS FROM OUR READERS

A REQUEST

Would you kindly send me a sample copy of your radio monthly; also yearly subscription rate and oblige.

Yours truly,
H. G. JOHNSON,
50 Alfred St., Allendale,
10-1-29 Ontario, Can.

■

OUR REPLY

***RADIO MANUFACTURERS' MONTHLY* circulates only to manufacturers and rated jobbers.**

Under separate cover we are sending you a copy of our current number, and enclose herewith a subscription card. If you are a manufacturing executive, radio engineer or jobber please fill out the card and we will start your subscription with the next issue.

Cordially yours,
RADIO MANUFACTURERS' MONTHLY,
10-3-29 Circulation Dept.

■

TO MR. HATHAWAY

The writer has read with a great deal of interest your article in the October issue of your good magazine, in which you discuss the rapid growth of the radio for the automobile.

Our company has been shipping both regular and special antenna for some time to be used in automobiles and the "specially prepared paper" containing the wires is our F. R. C. antenna wire fabric like the enclosed sample. The wire fabric itself as well as various radio appliances made therefrom is covered by our U. S. Patent number 1685875.

While I am not seeking any free publicity I do think that in justice to our part in the development of this fast growing industry, that credit should be given where credit is due.

Our structure is not only ideal for automobile use as regards efficiency, but also constitutes the most useful wire arrangement yet developed and also is very economical both in first cost and in installation. We appreciate the alertness of your magazine in taking cognizance of this new field and would request that you forward us one half dozen copies of this issue and charge us for same.

Yours truly,
THE FISHWICK RADIO COMPANY
10-16-29 By A. B. Fishwick

■

TECHNIDYNE ANNOUNCES

It may be of interest to your readers to know that the Technidyne Corporation has sold to the Ajax Electrothermic Corporation of Ajax Park, Trenton, New Jersey an exclusive license to the use of the Thomas A. Banning, Jr. Patent No. 1,667,715 and the Lester L. Jones Patent No. 1,608,560, covering coil systems, for use in the field of high frequency induction furnaces.

Under this agreement Technidyne Corporation has acquired the exclusive right to use or to license in the radio art, under the Edwin F. Northrup Patent No. 1,378,187 and another application of Edwin F. Northrup.

Yours very truly,
TECHNIDYNE CORPORATION
10-19-29 Joseph Jones
Treasurer

■

WANTS DIRECTORY

We wish to thank you for your letter of October 8th informing us that you have added the name of this department to your mailing list to receive copies of the *MONTHLY*. This is a courtesy we very much appreciate, and upon looking over the copy received, we are indeed glad to have it on file for the interest of our readers.

We are interested in knowing whether you publish a radio trade directory and should like to know more about it, in the event you do—information as to the price, date, etc.,?

Thanking you again for your very courteous attention, we are,

Very truly yours,
10-15-29 L. A. Eales
Head, Technology Department
BRIDGEPORT PUBLIC LIBRARY

Reply: Radio Manufacturers' Association publish a directory of manufacturer members of the industry. The Chicago office is 32 W. Randolph Street and in New York the address is 11 W. 42nd Street. A complete catalog and directory of nationally advertised speaker and receiving set manufacturers was just recently published by the General Contract Purchase Corporation who are located at 420 Lexington Ave., New York City. This publication includes complete addresses, prices and specifications.

■

TO MR. HARPER

I enjoyed your article WANTED—RADIO MEN appearing in the October issue of the RADIO MANUFACTURERS' MONTHLY, and I realize how hard it is to get seriousminded young men who will give real honest and hard effort toward thoroughly training themselves to render the service in the interest of both the manufacturer and the owner.

It is a problem which I think should not be left entirely to the manufacturer, the dealer, the educational institution, or to any one party, but I believe it can best be solved by all concerns working together through some form of trained organization which has had experience and can profit by past efforts.

I was particularly delighted to see following your article the one on the RMA RADIO SERVICE PLANS, of which Mr. Fenner is to take an active part.

I think in the past it has been the feeling that any interest our Institute or any correspondence school should take in cooperating with the industry was purely from a selfish motive in order to enroll students and not for the important service of rendering helpful results.

I wrote Mr. Flanagan some weeks ago to the effect that I was not interested in it for a personal gain to National Radio Institute, but I felt that all of the well-established correspondence schools should work together with the manufacturers, dealers, etc., to the formation of a uniform and acceptable service course and to either render it as a special course or as a part of their regular course in better preparing men for this work.

It becomes a very difficult task for the manufacturer of a Radio set to supply technical information for some fifteen or twenty different schools, and these different schools to use this technical information in various ways that might not serve the manufacturer and dealer according to his specific needs.

One central training committee, one from each school, which could even include some of the leading residence schools, could exchange ideas and work up a general service course that would embody the serious reflection of all, and be much more worthy of study and the getting of results.

I am having a complete set of our regular text books, along with our supplementary lessons and service sheets covering the entire instruction matter now used in our regular course prepared for Mr. Fenner, and it will be sent directly to you for your examination, and then to be passed on to Mr. Fenner to use in whatever way he sees fit in connection with his work.

I want you and Mr. Fenner both to know that National Radio Institute is only too glad to cooperate in any way in this work, even to the extent that the Institute should not be considered at all in the selling of these courses.

I have reservation made at the Hotel Stevens for attending the Radio Show next week, and if opportunity occurs, I shall be very glad to talk with you further regarding this matter if time permits on your part.

Very truly yours,
10-17-29 J. E. Smith
President
NATIONAL RADIO INSTITUTE

COPIES SENT

In the past it has been the policy of some of the trade journals to bind such descriptive or technical information as is printed from time to time in their magazines which are of value to the engineering organizations of the varied industries and I am wondering if your publication has anything along these lines.

The writer would be very much interested in having all such data as contained in the different magazines for the past twelve months and if such is not available in that form, we would like to have the complete editions from July, 1928 up to and including July, 1929, and we will cut and bind them for our own use, keeping them posted and up-to-date as received in the future.

You can consider this letter as an order for these copies for which you will bill us and when shipping them, please address them to the attention of the writer.

Thanking you, we are

Yours very truly,

THE CAPEHART CORPORATION

10-11-29 E. E. Collison

Vice Pres. & Chief Engineer

■

GLAD TO DO IT

I was very much interested in your story on the new musical instrument which you call the Theremin. As a matter of interest, we are planning to run a short note in the next issue of our House Organ. I wonder if you will be good enough to send me a photograph of the view shown on page 315 or similar photograph for illustrating the article. Of course, we will give your magazine full credit.

Yours very truly,

JOSEPH T. RYERSON & SON Inc.

10-11-29 Keith J. Evans

Advertising Manager.

■

1400 BROADWAY, NEW YORK CITY

In the October number of the RADIO MANUFACTURERS' MONTHLY there appeared an article under the heading "Service Men Organize", relative to the organization of The Radio Service Managers Association in New York; John S. Dunham, President.

We wish to obtain the mailing address of this Association, and will appreciate it very much if you will give it to us.

Yours very truly,

COMPO MFG. COMPANY,

10-23-29 Lillian C. Martin

■

POWER TRANSFORMERS

Will you kindly send us a list of the manufacturers who are making power transformers for the radio trade.

Thanking you for your attention, we remain

Yours very truly,

AMPERITE Corporation,

M. N. Liebowitz,

10-1-29 Pres.

NEW RADIO SOCKET

Cinch Manufacturing Corporation, one of the foremost manufacturers of fasteners for automobiles and other fields where fasteners are used extensively has produced a new and distinctive fastener.

It is based on that old and popular snap fastener principle.

Its many advantages were clearly defined in a half page advertisement in this publication in the October issue. In this advertisement, however, a correction should be made in the spelling of two words in order to avoid any misunderstanding. Bakelite is used throughout. In the advertisement it was referred to as polished "bakelight". In point four of the five descriptive advantages of this socket, the accessibility for soldering is featured although it appeared in the advertisement to read "soldering excessibility."

This socket is made in five different types and is used as standard equipment by fourteen of the largest manufacturers of the Middle West. Production is already sold up well in advance.

■

TEN-FOLD INCREASE IN METALLIZED FILAMENT SINCE 1927

During 1927, approximately 700,000 feet or 133 miles of metallized resistance filament was employed by licensees of the International Resistance Company, in the United States and Europe, according to the statement of Francis R. Ehle, its President. This quantity of metallized filament was quite aside from the amount used by the company itself in the production of its own Durham resistors.

"During 1929," states Mr. Ehle, "we anticipate an actual sale to our licensees in the United States, England and Germany, of some 2,500,000 feet, or about 470 miles of metallized filament. Our own Durham metallized resistor requirements will call for something like 1,000,000 feet of filament, or sufficient to make up some 5,000,000 resistors.

"The enormous increase is due largely to the tremendous expansion of the radio industry, and also to our more recent contacts with the talking picture, electrical sound recording, photo-electric cell work, aviation, and general electrical activities, all of which call for precise resistors. We have been obliged to expand our production facilities considerably in order to cope with this great demand. Although our products are essentially laboratory products, we have succeeded in making them confirm with mass production methods. At the same time, due to the standardization of mass production methods, stardardizing in a higher quality product.

"We anticipate an even greater demand towards the end of the year and in 1930. The metallized type resistor has become a standard in radio and many other fields requiring precise resistance at a moderate cost, with every assurance of long and reliable performance."

EXPANDS CREDIT SERVICE

Many hundreds of thousands of dollars are being saved annually to national radio manufacturers, frauds are unearthed and collection of accounts insured by cooperative service of the Radio Manufacturers Association according to Leslie F. Muter of Chicago, Chairman of the Credit Committee of the Radio Manufacturers Association.

The Association's credit and collection service, Mr. Muter announced, is to be expanded further in an effort to reduce still more the credit losses of national radio manufacturers who are members of the national association. These losses amount to several million dollars annually, according to information compiled by Chairman Muter and his Committee.

■

VICTOR ADDS HOLLYWOOD PLANT

The requirements of talking pictures have necessitated the doubling by the Victor Talking Machine Co. of its manufacturing facilities at Hollywood, Cailf., at a cost of $75,000.

The Victor company has awarded the Austin Co. of California the contract for design and construction of a duplicate of and an extension to the present plant of the Victor company at Hollywood, which was designed and constructed by the Austin Co. of California a year ago. The new building is to be completed about the middle of December.

According to C. H. Hall, Pacific Coast manager of the Victor Company, the new building will be used exclusively for the manufacture of records for Hollywood "talkies".

■

EDUCATING THE SET OWNER

"YOUR radio set is the best in the world—but there may be disturbances in the loud-speaker . . . The less your customer knows, the more your set is blamed . . . Let us educate the owner of your set by including our four-page leaflet on interference, its causes and its cures . . . A reading of this leaflet will take the blame off your set."

The foregoing is, in substance, the message that the Dubilier Condenser Corporation is sending out to sales managers all over the country, in an effort to educate the public in differentiating between a faulty set and some local source of inductive interference. The idea is simply to have dealers leave this booklet with the customer, along with the manufacturer's data on the set. If there is no interference, no harm is done; whereas, if there is interference, the owner will have a pretty good idea of its nature and how to go about eliminating it, instead of blaming it in some way on the radio set. Other parts manufacturers could well afford to adopt similar measures.

ASSOCIATION NEWS

Radio Manufacturers' Directors Consider Important Problems

Future broadcasting and radio industry events were considered by the Board of Directors of the Radio Manufacturers Association, meeting October 23rd at the Congress Hotel, in Chicago, coincident with the annual Radio Show at the Chicago Coliseum, which is sponsored by the association.

It was decided definitely by the Board of Directors that the great annual convention and trade show of the radio manufacturers' industry will be held next year at Atlantic City, during the week of June 2nd. Atlantic City won over Chicago, where the annual radio events have been held during the past three years, and other cities. The association Board of Directors ratified unanimously the recommendations of its show committee headed by Mr. J. B. Hawley of St. Charles and Chicago, Illinois, to hold next years' industry gathering at the seashore resort.

The Radio Manufacturers' Board of Directors also decided to cooperate with national broadcasting interests, including the National Association of Broadcasters and the trade chain organizations, The National Broadcasting Company and the Columbia Broadcasting System, in connection with retention on the air of national events such as baseball and boxing contests which, it is reported some private sports promoters are disposed to withhold from broadcasting. The facts regarding the plans for continuing the broadcasting of such events will be ascertained by a committee of the Radio Manufacturers Association, in consultation with officers of the national broadcasting interests. Mr. B. G. Erskine of Emporium, Pa., Chairman of the Radio Manufacturers Association Broadcasting Committee, heads the committee which will confer with the broadcasting industry.

Many other industry problems, including the complex patent situation; state and local radio legislation and merchandising problems also were considered by the Board of Directors of the manufacturers. Many of these problems are being worked on jointly with the national organization of radio jobbers and dealers, the Federated Radio Trade Association and the Radio Wholesalers Association, whose presidents respectively, Michael Ert of Milwaukee, Wisconsin, and Peter Sampson of Chicago, Illinois and their officers were guests today at a joint luncheon with the directors of the Radio Manufacturers Association.

Mr. H. B. Richmond of Cambridge, Massachusetts, President of the Radio Manufacturers Association, was prevented by illness from attending the sessions of the Board at Chicago, and in his absence Capt. Wm. Sparks of Jackson, Michigan, Vice-President of the organization presided, assisted by Mr. Morris Metcalf, of Springfield, Massachusetts, also a Vice-President. The manufacturers' organization now has almost 300 members, according to a report by Mr. N. P. Bloom, of Louisville, Ky., Chairman of the Membership Committee and is active in many fields in behalf of all branches of the radio industry and also the radio public.

The legislative information service of the association, according to a report made to the Board of Directors by Mr. C. C. Colby of Canton, Mass., Chairman of the Legislative Committee, now has been organized in 28 states and the organization nationally will be completed by January 1, 1930. This service provides for exchange of information regarding new legislation proposed in any municipality or state legislature affecting the radio public and industry. Effective steps are planned to conserve these interests in connection with local legislation, in cooperation with the national organizations of jobbers and dealers throughout the country.

■

BIRTH RECALLED

Chicago is the birthplace of the radio industry and was again the national radio capital of the country last month when the national radio show held sway at the Coliseum during the week of October 21st.

The R. M. A.—the Radio Manufacturers Association—was born in Chicago about six years ago and is incorporated under the laws of Illinois. Pioneers in this industry organization, now preeminent in the

EGLASTON RECEIVES RADIO MANUFACTURERS' GOLF TROPHY

The Dudlo golf trophy was presented, during the Chicago Radio Show, to Robert L. Eglaston, National Transformer Mfg. Co., its winner for the 1929 season, by G. Clayton Irwin, Jr., general manager of the show.

The event was witnessed by (left to right) R. W. Camfield, Jr., O. M. Holen, M. F. Flanagan, Leslie F. Muter, J. M. Sharpe, G. Clayton Irwin, Jr., Lloyd Back, Robert L. Eglaston, C. P. Smith, Harry Simpson, H. E. Leander, and P. D. Rensenhouse.

The Dudlo trophy was provided by the Dudlo Mfg. Co., division of General Cable Co., and is to be an annual award.

field of radio manufacture, were Chicagoans, and Chicago was and still is one of the greatest, if not the largest, centers of radio manufacture.

The Coliseum show and that at New York are made possible by members of the Radio Manufacturers Association. Both mammoth radio expositions are sponsored by the Association, which includes every large and important manufacturer of all radio products in this country. Most of the R. M. A. members will be represented at the Coliseum show exhibiting the last word in modern radio.

A large number of prominent Chicago manufacturers are among the officers and directors of the Radio Manufacturers Association. Among these are A. J. Carter, one of the founders of the R. M. A.; Henry C. Forster, now Vice-President of the Association; Towner K. Webster, Jr., Treasurer, and John C. Tully, past Treasurer; B. J. Grigsby, Leslie F. Muter, A. J. Messick, R. T. Pierson and Jess B. Hawley of Chicago and St. Charles, Ill. The Executive Secretary of the R. M. A., Mr. M. F. Flanagan, maintains offices at 32 West Randolph Street.

All of the R. M. A. founders were Chicagoans. The first President, subsequently reelected twice, was Major H. H. Frost, now of New York. The first Board of Directors, all now residents of Chicago, comprised A. J. Carter, Phil C. Lenz, J. McWilliam Stone, E. N. Rauland, A. A. Howard, and Frank Reichmann.

The R. M. A. works in close cooperation with the National Association of Broadcasters and the national organizations of radio jobbers and dealers, the Federated Radio Trade Association and the Radio Wholesalers Association, whose headquarters, like those of the R. M. A. also are in Chicago.

For the current year the President of the Radio Manufacturers Association is Mr. H. B. Richmond of Cambridge, Mass.

A wide variety of service is given continually by the R. M. A. to the radio public and also to all branches of the industry, as well as to its many members. The R. M. A. has been accorded recognition and cooperation by Congress and its branches, the Federal Radio Commission, the United States Chamber of Commerce, the Federal War, Navy and Commerce Departments, the Institute of Radio Engineers, the National Underwriters Laboratories, and similar national organizations with whom many enterprises of national scope are undertaken. With the R. M. A. of Great Britain, the R. M. A. of Canada, and also other foreign radio interests, the R. M. A. also works in close cooperation.

Headquarters are maintained by the R. M. A. both in Chicago and New York, for trade promotion, merchandising, publicity, traffic, credit exchange, exchange of patent information, and many other services through active committees.

NRTA ELECTS

The Northwest Radio Trade Association, at its regular fall meeting, elected J. W. A. Henderson as President for the ensuing year. Mr. Henderson has been very active in the association and its work for the past few years and is Minneapolis branch manager for the Edison Distributing Corporation, subsidiary of Thomas A. Edison, Inc.

H. H. Cory was re-elected Executive Secretary and Treasurer and will continue to direct also the annual show sponsored at Minneapolis by the association. It is reported that the show this year drew the largest attendance since the show was inaugurated eight years ago.

CHANGES NAME

At a meeting of the Board of Directors held Wednesday, October 23rd, at the Congress Hotel in Chicago, the Board of Directors of the Federated Radio Trade Association changed the name to the National Federation of Radio Associations. This is in order that the name will be more truly representative of that portion of the industry the association represents.

■

NFRA MEET

Future broadcasting, use of radio in schools and other problems of great importance to the radio industry were considered by the Board of Directors of the National Federation of Radio Associations meeting at the Congress Hotel in Chicago, October 23rd.

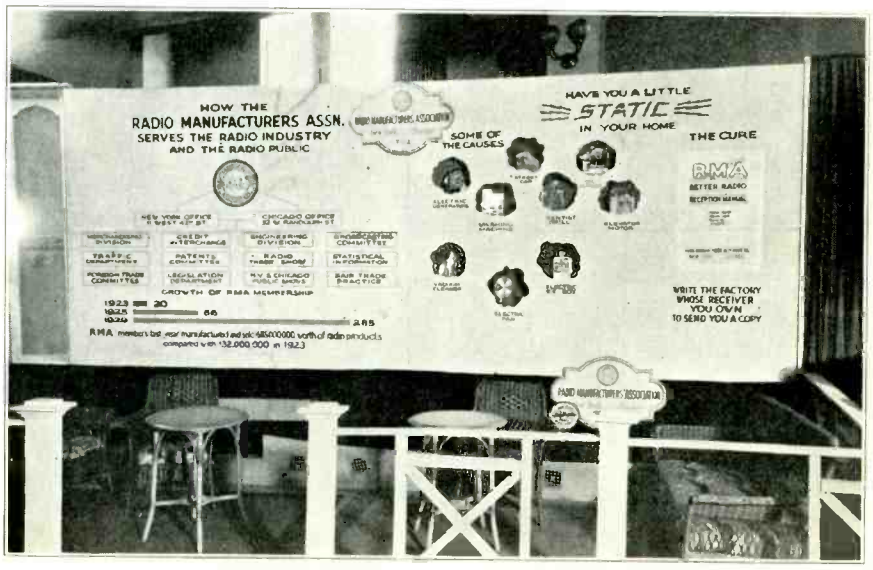
The Board of Directors decided to cooperate with the National Association of Broadcasters and the Radio Manufacturers Association in their program of cooperation with the national broadcasting interests in retaining the broadcasting of national sporting events such as baseball and boxing contests. It has been reported that some private sports promotors are disposed to withhold broadcasting these events which are of such great interest to the listening public.

The Board also voted to cooperate in increasing the use of radio in schools so that the younger generation may have an opportunity to receive the latest and best in radio music and industry events.

President Michael Ert of Milwaukee presided at the Board meetings.

THOUSANDS VISIT R. M. A. BOOTH AT SHOWS

Both the Radio World's Fair at Madison Square Garden, New York City, the week of September 23rd, and the Chicago Radio Show at the Coliseum the week of October 21st, included an institutional display by the R. M. A. Half of the display was devoted to sales promotion for the R. M. A. "Better Radio Reception Manual;" and the other half outlined some of the services which the R. M. A. provides for its members and, indirectly, for the radio listening public.



Approximately 600 copies of the Manual were sold at the New York show in spite of the fact that the display and booth attendants urged show visitors to write to their manufacturer for a free copy.

CHICAGO RADIO LEADERS END GOLF SEASON—KNOW THEM?

NEMA ELECTS

Following the recent annual meeting held at Washington, the National Electrical Manufacturers Association announces the election of Clarence L. Collens of Cleveland as president, and the appointment of A. W. Berresford as Managing Director, succeeding Alfred E. Waller, resigned.

Mr. Collens, who is president of the Reliance Electric and Engineering Company, has now served the electrical manufacturing industry as the head of every association of which he has been a member, including the Electric Power Club, Electrical Manufacturers' Council and the Electrical Manufacturers' Club. Mr. Collens served as Vice President of the Policies Division of NEMA since the Association's organization three years ago.

Mr. Berresford, the new Managing Director of NEMA, is President of the American Engineering Council and has been prominently identified with the electrical manufacturing industry for many years. He is past president of the A.M.E.S., the Electrical Manufacturers Club and the A.I.E.E. Mr. Berresford was formerly vice president and general manager of the Cutler-Hammer Manufacturing Company and vice president of what is now the Kelvinator Corporation.

Five vice presidents were also elected for 1929-30. They are S. L. Nicholson, Westinghouse Electric & Manufacturing Company, New York; C. H. Strawbridge, Goodman Manufacturing Company, Chicago; W. E. Sprackling, Anaconda Wire & Cable Company, New York; D. R. Bullen, General Electric Company, Schenectady, N. Y.; Louis B. F. Raycroft, Electric Storage Battery Company, Philadelphia.

■

MERGERS AND MERCHANDISE

A Statement by Pres. H. B. Richmond

Radio is keeping pace with other industries in the number of mergers taking place. But there are mergers and mergers. When a group of companies is consolidated with the sole purpose of financial expansion so that their well-watered stock may be offered to an unsuspecting public, then such a merger is a disgrace, not only to the men behind it, but to the whole industry. It is the rotton apple that spoils the whole barrel.

But there are constructive consolidations. Late this summer tube requirement statistics indicated that there was a contemplated production of receivers ten times that of last year. Discounting these figures on a three-to-one basis, and by checking leading manufacturers' production schedules, it has been found that the actual contemplated production was about three times that of last year. Even in a rapidly growing industry such as radio, this is somewhat optimistic to say the least.

Production schedules are now being cut to agree more nearly with actual requirements. But what is the result? Advertising and other appropriations made on the basis of a larger production now consume a greater percentage of the sale price than was allotted them, with the resultant reduction in profits. Is it, therefore, to be wondered at that several radio groups are talking consolidation?

Merchandising, advertising, patents, engineering—all are favored in radio by large production units. From necessity we shall witness several consolidations in the radio industry. Past radio consolidations have not been outstandingly successful as a group. Why? In nearly every case the consolidation has not been one of elimination of duplicate effort. Only when radio consolidations are made that bring about lower manufacturing and merchandising costs may they be looked upon as a credit to the industry.

MAJOR FROST ANNOUNCES FIELD SURVEY

The first nationwide field investigation of trade conditions in every section of the country will be undertaken by the Radio Manufacturers' Association, announces Major Herbert H. Frost, Chairman of the Merchandising Division of the RMA.

Trade conditions and practices in all parts of the country will be studied with particular reference to radio, Major Frost declared.

The basic principle underlying the survey is the fact that the buying habits of the people in one section of the United States are totally different from the buying habits of the residents of another section. Thinking and customs vary and sales appeals that are effective in New England, for instance, lack power in the Middle West.

This unusual merchandising study of the United States will be undertaken by William Alley, Merchandising Manager of the RMA, and is expected to consume the better part of a year before the trip is completed.

Mr. Alley's itinerary will take him into every State, from the East Coast to the West Coast and from Canada to Mexico. He will work in cooperation with RMA members and their distributing and retail organizations all over the United States, so that an authentic first hand picture of merchandising conditions and customs section by section throughout the country may be secured.

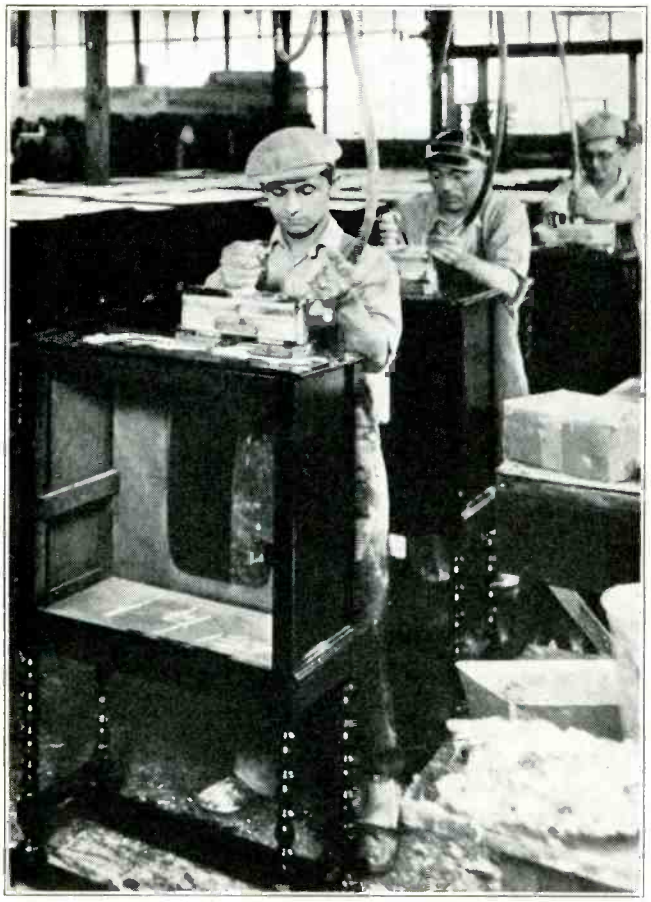
■

ROTATING MEETINGS

At the last meeting of the Board of Directors of the Radio Wholesalers Association it was voted that after the first of the year, the Board of Directors meetings of the Association would be rotated in different Metropolitan centers throughout the country.

CABINET CRAFTSMEN

The city of Auburn, Indiana, has long been noted for its woodworking craftsmen. Long before the inception of the automobile, Auburn boasted of its skilled wagon and buggy workman. Made up largely of German-American stock, these master craftsmen have handed



down this natural bent for doing-things-with-wood to the present generation. Here it was, that cabinets for Victrolas were made for many years.

Just recently the Steinite Radio Company acquired one of the leading Auburn woodworking plants. New, modern machinery was added. Now, cabinets housing every Steinite set are produced under the skillful hands of these pioneer craftsmen whose lives are devoted solely to that of the woodworking art.

Interior view of the Steinite cabinet plant showing various woodworking pieces ready for assembly.

ENGINEERING *PERSONALITIES*

Mr. R. M. Arnold has become associated with the United Air Cleaner Company in the capacity of Chief Engineer.

* *

Mr. George Holly is engaged in acoustical research with the Stewart Warner Radio Company.

* *

The Radio Engineers Club of Chicago held its opening fall meeting on October 10. A dinner was given which was followed by various technical discussions. Mr. Harold Oleson, president, presided.

* *

Mr. H. F. Waring is in charge of the transmission laboratories of the Universal Wireless Communication Company.

* *

Mr. D. E. Replogle has joined the engineering staff of the Jenkins Television Corporation.

* *

The firm of Jenkins and Adair, engineers of Chicago, have moved into larger quarters at 3300 Belmont Ave.

* *

Drs. A. H. Taylor and Ross Gunn are retained as consulting engineers by the Universal Wireless Communication Company.

* *

Mr. W. H. Hutter of the Webster Electric Company is concerned with the design of special audio amplifying equipment for radio and sound projection.

* *

Mr. Ray Kell is now in charge of television research for the General Electric Company at Schenectady.

* *

Mr. N. E. Wunderlich has recently published a paper entitled "Modern Production Testing of Audio Transformers and Audio Amplifiers."

* *

Mr. K. S. Weaver of the Westinghouse Lamp Company recently presented a paper entitled "The Production Testing of Vacuum Tubes" before the Chicago section of the Institute of Radio Engineers.

* *

Mr. Walter Evans, formally with R. C. A. Photophone Incorporated is now in Pittsburgh with the Westinghouse Electric and Manufacturing Company.

* *

Glenn Browning, David Grimes, and R. C. Enderwood have been added to the engineering staff of Temple, Inc. Browning will be connected with the research department investigating the trend of the industry, Grimes will serve in one of the many laboratories of the Temple factory, and Enderwood will be located in the production department.

* *

D. E. Replogle was unable to remain throughout the entire radio show in Chicago but did manage to spend a little more than a day in the city during which time he investigated television from the Chicago standpoint and conferred with several of the leading personages connected with television development in the midwest area.

* *

R. L. Caldwell chief engineer of Kennedy, took time during the radio show to call upon our associate editor, K. A. Hathaway, at his laboratory in the new Daily News building.

* *

Henry G. Richter who has for the past several years been known as the chief engineer of Electrad, Inc., has recently been appointed vice president in charge of engineering of that organization.

* *

Sylvan Harris, at one time with Stewart-Warner, has joined the Fada engineering staff.

MEN WHO HAVE MADE RADIO

GEORGE A. JACOBS

President
INCA MANUFACTURING CORP.

THERE is no more absorbing career in the radio and copper wire industry than that of George A. Jacobs, president of the Inca Manufacturing Corporation, recently founded by Mr. Jacobs and his associates at Fort Wayne, Indiana. The story of Mr. Jacobs' success as a manufacturer of wire products and windings for the radio, automotive and electrical fields, constitutes one of the most brilliant chapters in the development of the industry during the past quarter of a century.

The establishment of the Inca Manufacturing Corporation, with home offices and large manufacturing plant at Fort Wayne, Indiana, marks the foundation of the second large industry by Mr. Jacobs. He resigned as president of the Dudlo Manufacturing Company, and as vice-president and member of the executive committee of the General Cable Corporation, to found the Inca Company.

Mr. Jacobs definitely prepared for the success he later achieved in life by liberal education in the technical field. Born at Dudley, Mass., Aug. 29, 1877, he was educated in the public schools there. He prepared for his career as an electrical engineer by attending Worcester, (Mass.) Polytechnical Institute, from which he was graduated in 1900. There followed a year as manager of the Middlebury Light & Power Company and in 1901 Mr. Jacobs left to become a member of the large force of young engineers then needed by the Fort Wayne Electric Company, later the General Electric Company, at Fort Wayne, Indiana. It was while in the environment of the General Electric activities that Mr. Jacobs became deeply interested in methods and means of insulating the copper wire so essential in many electrical devices.

In order to pursue this line of investigation further, he left the Fort Wayne works in 1905 to take charge of insulating materials in the Sherwin-Williams Company at Cleveland, Ohio. He served as manager of the Insulating Department, in charge of both manufacturing and sales. It was during this time that he developed his ideas of enamel as insulating material for wire and worked out designs for machinery for the whole process of manufacture. He did this work largely in his spare time. The kitchen of his modest Cleveland apartment became the nursery of the future industries he was to head. Here with the cooperation of Mrs. Jacobs (nee Miss Ethel Mossman, Fort Wayne) whom he married in October, 1907, he set up his first factory in miniature, a tower of 6-inch pipe, 7 or 8 feet in height. Gas from the kitchen range provided the fuel, and electricity from the kitchen light plug, the power. Here the process machinery and enamel were tested and proved commercially possible and plausible. Mr. Jacobs soon severed his connection with the Sherwin-Williams Company in order to devote all his time to manufacturing and establishing his factory at Cleveland. The increasing use of the automobile brought about rapidly increasing demand for the products manufactured by him and in 1912 the factory was removed to Fort Wayne and the development of the plant gradually increased under a program of expansion that never stopped. The factory became the largest of its kind in the world.

In establishing the Inca Manufacturing Corporation, Mr. Jacobs and his associates have sought to provide in better fashion than ever before, the products so greatly

GEORGE A. JACOBS

in demand because of the phenomenal growth of radio industry as well as because of the increased use of electrical apparatus in every department of the world's activities. The Inca Manufacturing Corporation manufactures bare, enameled and insulated wire for the electrical, radio and automotive industries.

Although the Inca Manufacturing Corporation was not formed until mid-summer of the present year, the first unit of the great manufacturing plant at Fort Wayne has been practically completed and actual production will begin within a few days. It is contemplated to establish a branch factory unit at Los Angeles, California, at a later date.

Mr. Jacobs chose the name "Inca" for his new company as unique and picturesquely emblematic of the

copper industry. The ruling class of South American Indians in Peru at the time of the Spanish conquest in the 16th century were called Incas. Here copper was abundant and the Incas skilfully made many valuable and practical products from the metal. The name, beautiful and rich in poetry and romance, is inseparably bound with copper and its products.

Mr. Jacobs is distinguished as a manufacturer giving employment to many hundreds and contributing to the prosperity of his city and his country by providing products essential to the development and progress of the country's outstanding industries. He is no less distinguished as a private citizen, contributing generously, though unobstrusively and without thought of credit, to the welfare of his community. Serving as a director of business institutions, his advice is constantly sought. Many of the local civic and social clubs receive the benefit of his membership and his counsel. He maintains a lively interest in the American Institute of Electrical Engineers. The advancement of the profession of electrical engineering is ever close to his heart.

His interest is human as well as scientific and young engineers never fail to find in him a consultant whose interest is warm and friendly and whose advice is sound.

EXTENDING HORIZON OF RADIO

(*Continued from page* 364)

course, but plenty good enough considering the novelty appeal. Television ultimately will be incorporated with the sound receiver, but that is at least 5 years hence.

How about work on a photographic type of phonographic—the same style of recording and reproduction as the talking picture? It is our candid belief that while the usual disk is a good merchandising proposition, it is on the way out. We believe that within a decade, most of the home musical reproduction will be from photographic records on film, with an entire evening's entertainment on a large reel. With a bit of ingenuity, it should be possible to develop a simple and practical recorder, whereby the family group could register the voices of different members and friends, make singing records, and so on.

There is much talk these days about the centralized radio installation, or radio in every part of the house. And why not? Years ago, the fancy parlor stove, with its shining black sides and nickel trim, with wonderful scrolls and knobs and spires of late Victorian Period of fancy tastes, had to clear out of the home when the hot air furnace came along. Instead of a handsome stove in the living room, with the family huddled around in coldest weather because other parts of the house were freezingly uncomfortable, there came the unseen but hard-working furnace in the basement, piping warm air to every part of the house. Results rather than appearances won the day. Later came the steam and the hot-water types, but there were simply refinements of the idea of centralized heating.

Centralized radio must come—and soon. We shall shortly have a radio set in a given part of the house, with extension wiring and extra loud-speakers to all parts of the house. Perhaps at first the centralized radio system will be simply an extension of the standard living room

set, in its handsome cabinet, with suitable connections for the wiring to other parts of the house. The average radio set of today furnishes sufficient output to operate several extra loud-speakers. In fact, there is a big field here for the radio manufacturer in the way of wiring materials, outlets, volume controls, tone controls, remote tuning controls, and so on. Our present radio system is simply a step towards ultimate radio enjoyment, just as the ornate parlor stove was a step towards real comfort.

Remote control will provide many opportunities for radio manufacturers, by way of including the feature in their sets and also by way of accessories for use with existing sets.

And if we must go outside the field of radio itself, there are many opportunities. The radio manufacturer who has primary production facilities, such as punch presses, automatic screw machines, moulding equipment and so on, because he makes most of his details, is in an excellent position to fill in with other products. Recently, several radio manufacturers have looked into the matter of electric and gas refrigerators. One large manufacturer who has set a mark in the way of a production of 5,000 complete cabinet sets of high grade each working day, has obviously too big a production to keep going at top blast day in and day out throughout the year. This manufacturer aims to produce an electric refrigerator for $100.00 or less. And we predict that he will do so, for that is no greater achievement than his splendid radio sets at the prices he has been asking.

We know of one or more radio manufacturers who have turned to aeronautical instruments as a side line. This is a good bet, for such instruments involve the same precise workmanship as radio assemblies. Furthermore, it is a growing market.

Electric clocks are also attracting the attention of some radio manufacturers, for it is positive that every home with an electric light wiring will ultimately have an electric clock to keep active time without winding. Such a line is ideal as a side line, for there is no obsolescence and the radio manufacturer could make up a large stock during off seasons, while turning to his radio production when necessary.

There are many delicate devices required in the conduct of modern office work—devices calling for no mean degree of ingenuity in design and great care in production. Here the radio manufacturer can again find a profitable side line, for office appliances sell all year round and the rate of obsolescence is so slow that a large stock can be piled up during active production. There is also an opportunity to make many appliances for the modern factory, such as testing equipment, counters, automatic recorders and so on.

How many are giving real thought to the photo-electric cell? Very few. Yet here is a device which positively intrigues the imagination of the skilled radio engineer. No end of things can be done with this interesting device, both by way of entertainment and actual industry. We hear many yarns of how these devices are used to sort cigars according to their color, to grade asparagus tips, to count packages flashing by on a belt or chute, and so on. Surely there are many devices to be designed for industry, and no one is better fitted than the radio manufacturer.

All of which may cause some of our readers to say: Well, we're in the radio business. What's all this got to do with solving our problems!

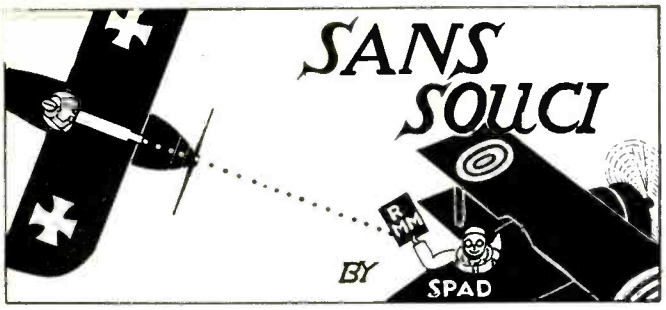
To which we hasten to reply that while we are anxious to see the radio business pushed to the utmost, the fact remains, nevertheless, that there is a constant threat of overproduction in the radio industry. Year after year sees a large proportion of the production dumped at ridiculous prices. For instance, as these lines are being written, there are dynamic loud-speakers being sold for as low as $4.85. Imagine that! There are loud-speakers originally designed to sell at $75.00, which means that the production cost must have been around $15.00, being dumped at $8.50. Obviously, the radio industry is still in its babyhood. We certainly never see $1200 automobiles being dumped at $150—no sir, not until they have clocked off some 25,000 miles of hard wear, after having fetched the list price.

It certainly would be far more sensible and economical to have a round-table gathering of radio set manufacturers, so as to determine just what is a safe production schedule for the forthcoming season. The radio trade association should be charged with the task of surveying the market and advising the radio industry as to the probable demand. Then the members of that association so advising them, should have sense enough to decide their respective production on a safe and sane basis. There should be none of the boastful attitude of producing enough sets to surpass every competitor. Each manufacturer should determine upon a reasonable proportion of the probable total, so as to avoid the ruinous practice of dumping.

While we have dwelt mainly with radio sets, the same holds true of vacuum tube manufacturers. We are appalled to find, almost daily, a newcomer into the vacuum tube industry. And each manufacturer is exerting every effort to produce as many tubes as his capital permits. The result is an inevitable over-production, despite the frequent assurances that there will be a shortage this fall. Of course there may be a shortage of first quality tubes; that is quite possible, and even probable, for the frantic production schedules often do not permit of conscientious testing and rejecting practices.

Let's extend our radio horizon! Let's practice the live and let live policy! Let's do some of the research and engineering developments ourselves, individually, rather than wait for George to do it. The trouble with sitting on George's doorstep to see what is new, and then to hasten to copy what George does, is that George is getting patents on many of his ideas and hard jobs, which may block us from copying quite as freely as possible. Furthermore, it does pay to be original. So let's get busy on the side line, as an inducement to avoid over-production.

Join your Association! As a member, then, give your Association and its officers your earnest support. Big things, legislative and otherwise, are accomplished with good association work in any industry or its branches.



Radio Diet Prepared by Dieticians of the Monthly.

First Day

Breakfast: 1 cup Boyers Coil Dope.
Lunch: 1 cup Boyers Coil Dope.
½ Eby Binding Post.
1 Durham Resistor.
Dinner: 1 cup Boyers Coil Dope.
1 Wright-De Coster Speaker.
1 Dongan Transformer.
1 foot of Kester Solder.

Second Day

Breakfast: ½ cup Boyers Coil Dope.
1 small piece of Formica.
Lunch: 1 Oxford Speaker, (without field coil).
1 Centralab Volume Control. (logarithmic curve).
1 227 Cathode Heater dipped in Boyers Coil Dope.
Dinner: 1 cup of Iced Boyers Coil Dope.
½ Kyelectron.
6 DeForest 424 Audions.

Third Day

Breakfast: 1 Cinch Socket in Boyers Coil Dope.
1 Eby Binding Post.
Lunch: 2 Cinch Sockets.
6 Eby Binding Posts.
1 Holed-Tite Tube Pad soaked in Aluminum Spray Paint.
Dinner: 2 Burtex Cones with Cadinium Sauce.
1 glass Boyers Coil Dope.
1 Field Coil by Dudlo.
6 issues of Radio Manufacturers' Monthly.

Note: Above diet to be repeated until 18th day. At end of third day if dieter experiences discomfort 6 glasses of Magnesium Sulphate taken after each meal will give relief. If this fails, those who have access to a Von Lepel Bombarder will find a more satisfactory relief in the following: swallow 1 Eby Screen-Grid Tube Shield filled with Trinitrotoluene. After well digested apply Von Lepel Bombarder over abdomen until relief comes. This treatment is to be used at end of each third day only. This special feature of the diet is especially recommended. Many dieters have found that the first three days they gain considerable weight but with this special treatment, using the Von Lepel Bombarder, a great reduction of weight is immediately noticed.

We will be very pleased to publish any word from our readers who have taken this diet. If you are a dieter please bear in mind that the entire industry is anxiously waiting to hear of your results.

* *

At last the vacuum tube antenna has been invented. This comes as a great relief after so many years of patient waiting. Needless to say, the new aerial amplifies the received signal, increases the selectivity, eliminates static, improves the tone quality 500% and prevents the usual accidents so frequent in cleaning old type roof aerials.

* *

Radio loud speakers have been installed in the plant of the Chair City Upholstery Company of Garden City, Mass., to determine if music can lighten the routine of factory labor.

If music doesn't do it they might try letting the boys sit down in the upholstered chairs.

The CeCo Manufacturing Company of Providence installed radios and found that the men work slower while hearing classical music, but faster when they listened to jazz.

Some efficiency slicker should come along with a phonograph and a recording of "Pony Boy."

If the noisy machinery interferes with radio reception, the union should demand that the employer tune out the machinery.—*Ted Cook in Chicago Herald-Examiner.*

EDUCATION SYSTEMS

(*Continued from page* 366)

Employees who have been working at common labor often desire training. Many have been upgraded in this way.

Employment cost for machine operators is definitely reduced by having the applicant for such position go through the training room. Many who are unsuited to the kind of work which they claim to be able to do are thus prevented from spoiling and wasting material in the Manufacturing Division.

Careful supervision is given the learners in the training room and an excellent safety record is maintained there. Employees who have received such training are generally good safety boosters, they are enthusiastic, they appreciate their opportunities and they are loyal.

There are no "exercises" to do in the training room but all work is production work and the learners immediately have to produce work accurately and in accordance with specifications. They are encouraged to speed up their work as rapidly as their progress will permit.

The training in the machine room is supplemented by a brief course in blueprint reading, simple mathematics and machine shop lectures on the handling of tools.

Emergency Drafting

The demand for draftsmen is often so great that we have found it necessary to train a group of carefully selected young men to become draftsmen quickly. A one year course has been arranged and 25 to 30 young men who are high school graduates and who may have had one of two years machine shop or drafting room experience are selected to take up the course. They are placed in a classroom eight hours per day where they first learn the elements of drafting. As soon as they are able to do a fair grade of tracing and detailed drawing, such work is provided by the various Drafting Sections. It is carried on in the classroom under careful supervision by the instructor. The regular drafting training is supplemented by definite courses in mathematics, mechanisms, mechanics, electricity and other subjects directly relating to drafting. A number of visits to machine shops, foundries and pattern shops are made and lectures are given the students on practical shop problems and methods.

Students are paid special and rather high rates while learning. They are able at the end of one year to go into the drafting division quite well equipped to carry on the regular work.

This method of training draftsmen is supplementary to our regular three year apprentice course and is used only when excessive demands make it necessary.

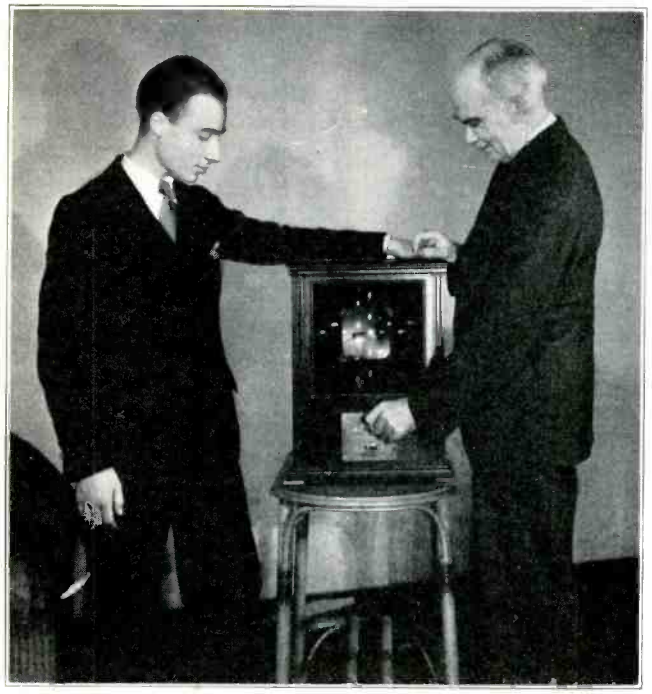
WORLD RADIO FIGURES

The total value of the radio set installations in the world is estimated at $1,843,750,000 by the Department of Commerce. The value of broadcasting stations in operation is placed at $22,682,222. The report states there are 21,629,107 receiving sets in the world; the United States having 10,250,000. Europe, aside from Russia and Turkey, has 9,139,824 sets.

The figures indicate there is one receiving set for every 12½ persons in the United States, one for every 53 in Europe and one for every 88 in the world.

TELEVISOR AWARDED

In the picture are shown Dr. Lee DeForest presenting Ingram



Bander, of New York, winner of the recent Jenkins Television Prize Essay Contest, with one of the first commercial models of the Jenkins Televisors.

MAKING STRONG GRIDS FOR WELL-BEHAVED TUBES

If the filament or heater represents the heart, and the plate current represents the blood circulation, certainly the grid represents the mind or controlling member of the usual vacuum tube. It is essential, therefore, that the grid should be correctly proportioned and positioned if it is to control tube action in the intended manner.

The usual vacuum tube grids are made by notching the parallel support wires and then winding the grid wire proper so that each turn is held in the corresponding nicks. While this method serves well enough for the larger grids, it is somewhat cumbersome for the finer grids employed in the A.C. and D.C. screen-grid tubes. The closer spacing of turns proves troublesome, and there is always danger of having the wire squirm or work loose in the nicks.

The engineering staff of the DeForest Radio Company, under the direction of Lee DeForest, long ago worked out the spotwelded grid, in which each turn is spot welded to the support wires, forming a welded or solid grid structure. The spot welding, as demonstrated at the Radio Show, is accomplished in an ingenious grid-winding machine which not only spot welds each turn but automatically spaces the turns and even spaces between successive grids, dropping complete grids into a tray for immediate use, as contrasted with the usual method of continuous winding in which girl operators must unwind part of the grid turns and trim the wire to form a finished grid. The wire employed is the expensive molybdenum or "molly", so that the saving effected in the DeForest grid winding machine is appreciable when dealing with tens of thousands of grids per day, quite aside from precisely uniform grids.

RECRUITING RADIO'S RETAILERS

(*Continued from page* 372)

versified location under all sorts of conditions in every section of the country. They are, therefore, doubtless entitled to considerably more credence than the usual survey and analysis of this kind. While these figures were largely concerned with the dealers' volume in 1927 and while figures for the radio business have been undergoing change at a dizzy rate, the portion of these findings we are at present concerned with have doubtless remained accurate to the required degree.

The point is that this survey showed 62 per cent of the well rated furniture dealers in the United States selling radio. This, for example, is probably a fairly steadfast figure. If there has been any marked change, and the figure was available, it would probably be found that a greater rather than a lesser percentage of the nation's well established furniture stores are now retailing radio.

The same survey showed that of the several thousand merchandising power companies, only 28 per cent were selling radio sets at the close of 1927. The all electric set has, of course, produced a marked change in this percentage, which has probably been multiplied by three or even more since then.

And here is a type of outlet every manufacturer should seriously consider. Perhaps it is because the reasons for legitimate power company interest are so obvious that they haven't appeared to make more of an impression upon the radio industry.

The primary interest of the power company merchandiser is additional load on the lines of the company, More and more, the utilities are coming to realize that they are entitled to and, in the interests of the entire electrical industry, should demand a legitimate merchandising profit. But even so, the utility thus has an additional end in view—increased load—which is a more powerful stimulant to aggressive merchandising effort than is re-sale profit to the independent dealer whose sole interest is in the merchandising end.

Not that radio of itself is such a tremendous load builder although the A-C set is a factor in power company consideration from this standpoint. Radio also keeps people up longer of nights and, the longer they are up, the more current they consume in providing themselves illumination.

The utilities have what many an independent store lacks in one respect or another—adequate capital, competent management and the urgent desire to build load. They should prove to be one of the very most desirable types of retail outlets for the radio manufacturer who can get started with them on the proper basis.

Another class of dealers who have a particularly urgent reason for wanting to sell radio are the hardware merchants although many of these hardware retailers—unlike the utility men—don't realize it. The survey of hardware dealers' electrical and radio lines, referred to just above, indicated that more than half——53 per cent to be exact—of the country's more than 11,000 leading hardware merchants were selling radio in 1927. We imagine that figure will be a surprise to many a reader of these lines. And though we can't back up such an assertion with figures, we fancy that this percentage has

increased in the last year and a half and that it is due to show a still greater increase.

Probably more than any other class of store, the hardware establishment today positively needs a greater percentage of women shoppers. In this connection it is interesting to study the results of a recent nation-wide survey completed some time back by the General Research Corporation. Two thousand hardware dealers in every corner of the country were personally interviewed to learn what percentage of their store visitors were women. Of the 2,000 dealers, 1,229 reported that less than 50 per cent of their customers were women. In 397 stores, less than 20 per cent of the shoppers were women; 739 reported less than 30 per cent; and 1022, or more than half the dealers interviewed, stated that women made up less than 40 per cent of their customer total. Thus only 771 dealers out of 2,000 enjoy the obvious advantages of a group patronage composed of women by more than half. Only 39 per cent of all the hardware men interviewed have more than half their shoppers among the women of their trading areas.

Line these figures up against the generally accredited figure for the total amount of buying at retail which is done by women. It is popularly held to be *at least* 85 per cent. Hardware dealers are feeling chain store competition. No other type of dealer is undergoing such radical changes in his stock and in his ideas. There is no room to cite all the proofs here but it is an established and easily provable fact that hardware dealers are awake to the necessity of getting more and more women in to the store and of getting the women to look upon the hardware store as their store just as they already do the department store and the furniture store in much larger degree. That is why many a hardware store, particularly in the neighborhood shopping districts of metropolitan centers, is taking on more and more the aspects of a house furnishing store with glassware, gift departments and so on as regulation merchandise and departments.

Bringing home this necessity to the hardware retailer is just about the finest entering wedge if you want to get him started with radio or want to get the hardware man, already launched in radio, to give it the effort it merits. Radio *does* bring women to a hardware store.

The hardware dealer is also much more accustomed to selling merchandise which requires servicing than numerous other types of dealers, looked upon as logical outlets for the radio manufacturer, such as the department and furniture stores. We know of a hardware dealer who realized the possibilities for him in radio and electrical goods. Though his radio volume was not large enough to justify the employment of a full-time service man, he put on a capable chap and set him to work installing convenience outlets at a fixed price in his spare time. Thus he solved his radio service problem and enlarged the scope and sales of his electrical goods department at one and the same time. Hardware men, by virtue of experience, have much more patience with and do a better job of handling a product requiring servicing than the department store buyer type or the furniture man. Think of this a moment and you will realize the very obvious truth in it.

What about these department stores anyway? Well, if you ask us, it's so largely a question of the individual

store that there's hardly an answer to be given in the general sense. Many a department store has added radio because it felt it had to and this isn't a happy arrangement. A radio set is a strange animal demanding a totally new type of handling to many a department store merchandiser. If you are familiar with department store lines and methods, this isn't hard to understand. Margins in the radio business; the servicing necessities; direct selling—these are a few outstanding reasons why many a department store hasn't displayed its normal quality of merchandising skill when it comes to radio. As always, however, there are the exceptions to the rule and if you can get a department store dealer, and can help him, and he wants to sell radio, and you can maintain the proper relationship, and not offend jobbers and other good dealers by starting him in business, there's no law against it and individual circumstances must govern, of course.

Another type of radio outlet which is at present the subject of much speculation is the electrical contractor-dealer. Personally, we've never held with some that the contractor is the universal panacea for electrical and radio manufacturers with merchandising difficulties. The contracting and merchandising functions are widely removed from one another. There is no reason why a man, because he is successful at contracting should automatically be a success at merchandising. There are, quite often, good reasons why the successful contractor will fail dismally at retailing. Furthermore, the state of the electrical contracting business has and continues to be such that the average contractor who gets on in the contracting end of his business has everything one man wants to do staring him constantly in the face.

Here again, there are the exceptions. Considered from its electrical aspects and purely from its servicing aspects, radio is right up the contractor-dealer's street. It was natural that people in search of radio should go to the electrical stores in the earlier days of the business—and many of them still do. Sixty-two per cent of the more than 8,500 best rated contractors in the country were reported to be selling radio in 1927. What this figure should be for 1929, no one seems to have attempted to figure out.

And in looking over the results of the indicated survey, here is another interesting incidental. Fifty-eight per cent of the hardware dealers reported upon were selling radio accessories as against only 56 per cent of the contractor-dealers. Would you have thought it such?

There is another type of store which may grow out of the radio business in the future and do a large share of the industry's retailing. This is a specialty shop handling radio and some other line or lines which will probably be seasonal with the high point at some period of the year when the radio business is not at its capacity stride. Electric refrigeration is already proving to be the answer in more than a few instances. Here is another line with merchandising problems paralleling those of radio at many points and offering employment for the same type of salesman and service men and with a logical peak at the other end of the calendar from radio.

Electrical health appliances seem a likely double for this type of specialty store together with various other major electrical appliances. There is also the home movie camera. There is the electric phonograph. There

is the promise of television, which bids fair to be a proposition entirely separate from radio so far as domestic reception is concerned, and the threatened imminence of talking movies for the home.

None of these last are yet commercial realities but they point a trend nevertheless—a new type of store, replacing the old music store, and merchandising home entertainment is perhaps in prospect. What were once music stores, although they still keep a rack of sheet music in the window and house a record cabinet, have in a multitude of instances come most nearly being that thing we hear about and are seldom able to locate—radio shops in the actual sense of the word.

The time may come when radio retailing will not have a major aspect of servicing but there is no indication of it at present if we honestly face the facts. There's nothing to be gained by passing the buck to the tube manufacturers and trying to skip out from under. That's too much like the proverbial tactics of the ostrich and won't make money for anybody, including the manufacturer.

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Radio is a big job for the retailer and whenever you find a dealer doing a good job with radio, making money at it, and happy about it, you will invariably find that he looks upon it as such, that he is giving it everything he has in management, high grade employes, merchandising judgment and so on.

Making money at radio retailing is no sinecure. Plenty of dealers are doing it but a radio department can't be operated on a notions counter basis. And the manufacturer and wholesaler can play a big part in many a dealer's success and mark the difference for the dealer between success and mediocrity—and even failure—if they will.

FIELD WITHOUT FENCES

(*Continued from page 370*)

Taking all the facts of the situation we believe that the future will see the inclusion of a radio service staff in the personnel of each and every air port of consequence. In addition to this larger transports will require operators who will be sufficiently familiar with their apparatus to properly take care of it. In some cases many lives and the success of a venture will depend on the operator's ability to send and receive dependably, information relative to weather conditions, the location of the plane and the proximity of landing facilities.

We believe that this phase of radio service will prove of utmost importance and that it should be given its proper attention by everyone interested in radio service work. At the same time the possibilities of air transport transmitters and receivers should not be overlooked by the manufacturer.

NEW VICTOR CABINET

A new set by Victor "Model R-52" has just been announced. It is housed in a brand new and decidedly striking cabinet. Matched butt walnut veneers are used in the inlaid medallions of the doors. Finest American walnut gives a rich and lustrous surface to the

body of the cabinet and the bandings are of selected clear walnut. Inside, panels of bird's-eye maple are worked into the design and walnut again appears as the dominating color and texture. The hardware is of antique design. The opening in front of the speaker is curtained with rich Bengalese damask, the color of etched gold.

HELPING DEALERS SELL

As a selling aid to their thousands of dealers throughout the country, Steinite Radio Company has prepared a new Dealer Profit Packet which contains a quantity of diversified display material for creating effective window displays.

The packet contains a 3 x 8 foot muslin banner in vivid red and black announcing the new Steinite Super Screen-Grid Radio and the price of $118. This is for the dealer to hang ouside his store. A three-piece painted display in brilliant colors and containing a human interest appeal, is supplied for window use, together with six 6″ x 24″ colored window streamers, four large colored price cards to be hung inside the window, and four price cards with easel backs for use on top of the sets.

"Since this is essentially a colorful age," said Oscar Getz, vice president of the company, "all of our dealer display material has been designed in as highly colorful manner as possible, so as to produce a direct 'eye appeal' in the dealer's window. An attractive show window is one of the cheapest and best forms of advertising which a dealer can use."

In addition to the above mentioned material, the Dealer Profit Packet also contains folders for the dealer's prospects and a Steinite electric sign of metal with the name Steinite shining out in brilliant red, and the words "Super Screen-Grid Radio" below in green. This is effective for either day or night use, inside the store or out.

DIRECTORY PUBLISHED

Filling a highly important statistical gap in the radio production and distribution system, the General Contract Purchase Corporation recently announced that the new 1929-30 Winter Edition of the General Radio Catalog, the only reference handbook of its kind, was off the press and available to the industry.

A ready reference of accurate and detailed information concerning practically every receiving set and speaker on the market, the new handbook is the outgrowth of an early reference guide which was issued a year ago.

Practically all radio set and speaker manufacturers cooperated in the production of this 125 page manual which provides a complete reservoir of date of indispensable value to the entire radio industry.

Information compiled in the book includes the names and addresses of radio set and speaker manufacturers and their branch offices; names of company officials and branch managers; all recent consolidations and mergers; trade association memberships; company representatives in trade associations; patents and patent licenses held; broadcasting carried on by manufacturers; types of sets and speakers manufactured; cabinet styles; types of all tubes or rectifiers used in each set or speaker and list prices of sets and speakers.

The new Winter Edition has been prepared in regular bound pocket-size, catalog form. Complete information may be had by addressing the Book Dept. *Radio Industries.*

HEADS NATIONAL UNION

A young man, just past thirty, is the newly announced president of the National Union Radio Corporation, the huge $16,000,000 radio tube combine, today one of the three largest radio tube companies in the world, which has in the past few months taken its place as a dominant figure in the radio field.

The young man is Mr. Nathan Chirelstein, modes, dynamic, typical of the brilliant and energetic young men who have grown up in the past few years with the fast-stepping radio industry. Fighting against early odds, Chirelstein studied at night to enter the bar. When many older heads were turned away from the then struggling radio industry Nathan Chirelstein saw in it possibilities which appealed to his natural inclinations. Radio tubes engaged his active interest. He studied them, deliberated upon their future prospects, and then with characteristic action marshalled a capital of less than $500 and with his brother, Harry Chirelstein, embarked in 1922 on his radio career.

In less than three years Chirelstein's Radio Tube Corporation had become the outstanding Sonatron Tube Company, which in recent years forged steadily to the front. It was this concern which formed the nucleus for the National Union Radio Corporation, which merged with Sonatron, the Magnatron, Marathon and Televocal businesses. The executive ability which made Sonatron a figure of importance was given a larger scope with the election of Mr. Chirelstein as president of the National Union, now one of the three largest tube companies in the world.

Chirelstein has little to say of his own rise, but talks enthusiastically of the tube business in general and of the future of his company which already contemplates the addition of several other tube manufacturers.

"Few people realize," he declared recently, "that the

tube business in this country actually has outstripped, for instance, the light globe and bulb business in sales. But it's a fact. More than $110,000,000 in tubes were sold last year. I confidently predict that the sales this year will double that amount.

"The National Union Radio Corporation is making 35,000 tubes a day, and planning on production of 100,000 tubes by January 1. When one realizes that in addition to radios, the industry supplies tubes also for such electrical devices as the talkies; phonographs; long distance and multiplex telephones; television; automatic counting and color matching systems; radio compasses; public address systems; smoke and light detectors; and burglar and fire alarms systems, one can begin to catch the vision of what will be very soon one of the greatest of industries."

AMPLION SOUND INSTALLATION

A very interesting installation of sound equipment manufactured by the Amplion Corporation of America, has been completed recently at the Mayfair Theatre in Newark, New Jersey. This is a motion picture house, seating 1200 persons.

Two new-type Amplion turntables are utilized,—one for each projector. Each turntable is driven by its respective projector motor, through a chain drive.

The amplifier is a double channel, type 2F2A Amplion product. Each channel consists of a separate three stage amplifier, employing two 226 tubes, one 227 tube, two 250 tubes in push-pull and two 271 half-wave rectifiers. Van Horne tubes are used throughout.

The double channel amplifier is arranged so that either channel can be put into operation by merely throwing a switch. Hence, if any small trouble should develop in one of the channels, the outer one is always ready as emergency equipment.

Each amplifier is provided with one of the new Amplion constant impedance faders. These regulate the volume of the sound without altering the frequency characteristic of the phonograph pick-up or the input transformer to which it is connected.

With the exception of the loud speakers, all equipment is installed in the operator's room. A small monitor speaker, hung on the wall of this room, enables the operator to check up on the operation of the complete equipment.

Two ten foot exponential air column horns are used, in conjunction with two type AA-102 Amplion Giant dynamic units. These are placed directly behind the screen on the stage. They are tilted slightly downwards, since the acoustics of the theatre require this. This is an example of an important advantage of the horn type speaker over the cone type. The latter is non-directional and in general is unsuited for talking picture work.

Both speakers are used at once, although either one may be used separately in an emergency. Even one speaker will furnish more than sufficient volume to reach the back of the theatre. The speakers are connected to the amplifier by wiring run in conduit.

Acoustical experts have pronounced the Mayfair Theatre sound installation to be perfect in every respect. Sound can be heard distinctly in any part of the house with perfect reproduction.

SECURE FREIGHT REDUCTIONS

Freight rate reductions on Radio products aggregating more than $1,000,000 annually have been secured from the carriers by the Radio Manufacturers Association Traffic Department.

The new radio rate schedule, effecting a saving of approximately 10% in annual freight bills of the radio manufacturers on Radio Receiving Sets, Combinations, and Loud Speakers, will go into effect about January 1, 1930.

In addition the carriers have granted requests to the Radio Manufacturers Association for rate reductions to the Pacific Coast which became effective September 15, 1929, affecting carload shipments from Buffalo and points West, with an estimated saving per car of about $200.00, or a total to the industry of $500,000 annually.

After more than a year's negotiations with the Joint Classification Committee, representing all of the principal Trunk Line carriers, the Traffic Department of the Radio Manufacturers Association, which includes every prominent manufacturer of all radio products secured the freight reductions sought. Also represented in the rate reduction applications were the national organizations of radio jobbers and dealers, the Federated Radio Trades Association and the Radio Wholesalers Association.

The rate reduction of approximately 10% applies on console receiving sets. In some cases the freight reductions however amount to as much as 24% on table models.

The new reduced schedules will virtually revise present radio rates which were fixed when radio receiving sets were not the sturdy product of today and were shipped in make-shift containers of various fragile materials. Many hearings have been given the Traffic Department of the Radio Manufacturers Association, headed by Mr. W. J. M. Lahl of Chicago, by the Joint Classification Committee, in the campaign to secure reduced rates which would be fair both to the carriers and to the radio manufacturers. This has been pursued during the past year and a half, first by Capt. Wm. Sparks of Jackson, Michigan, former Chairman of the Traffic Committee of the Radio Manufacturers Association, and recently by Mr. B. J. Grigsby of Chicago, the present Chairman.

Illustrative of how manufacturers will greatly benefit by the new reduced rates, carloads of Radio Receiving Sets, Consoles, from New York to Chicago are now charged at approximately $249. Under the new rate the carload charge will be about $224. Savings between other points are estimated to run approximately as follows:

From Chicago to	Present Rate	New Rate
Cincinnati	$137.00	$124.00
Buffalo	165.00	150.00
St. Louis	135.00	120.00
Minneapolis	150.00	135.00
Denver	440.00	395.00
Dallas	418.00	377.00

On mixed carloads and table receiving sets, the new rates are expected to effect approximate savings:

From Chicago to	Present Rate	New Rate	Percentage
New York	$298.00	$226.00	24%
Cincinnati	165.00	130.00	21%

Buffalo	200.00	157.00	21%
St. Louis	160.00	127.00	21%
Minneapolis	182.00	146.00	20%
Denver	529.00	400.00	24%
Dallas	502.00	412.00	18%

The details of the new schedules agreed upon between the Carriers and the Radio Manufacturers Association effective about January 1, 1930 follow.

The present ratings will be revised and new descriptions will be as follows:

Radio receiving sets, console type, minimum weight 18,000 pounds, second class rating, as against the present minimum of 20,000 pounds.

On box or table type of receiving sets the minimum weight will be 24,000 pounds, at third class, instead of the present minimum of 20,000 pounds at second class. In addition to the above changes mixed carloads will be provided for which will include radio receiving sets, console or box type, combined talking machines and radio sets, talking machines electrically amplified or otherwise, talking machine records or record blanks at minimum weight of 24,000 pounds at third class rating. This supersedes the present 20,000 pound minimum class, on radio receiving sets.

The Radio Manufacturers Association Traffic Committee which negotiated with the carriers for the substantial freight reductions granted comprises the following:

B. J. Grigsby, Chairman, Chicago, Illinois.
W. J. M. Lahl, Manager Traffic Department, Chicago, Illinois
Wm. Hildebrand, Vice-Chairman, Eastern Division, Orange, N. J.
E. W. McMasters, Philadelphia, Pa.
J. F. Moriarty, New York City, N. Y.
D. Levy, Newark, N. J.
J. B. Swan, Jr., Philadelphia, Pa.
N. H. Lawton, New York City, N. Y.
L. R. Ahern, New York City, N. Y.
G. H. Newman, Chicago, Illinois.
P. E. Anderson, Chicago, Illinois.
J. J. Lynch, Jackson, Michigan
H. J. Weber, Huntington, Indiana
Geo. J. Burke, Chicago, Illinois
L. P. Siddons, Chicago, Illinois
B. R. Joel, New York City, N. Y.
H. Thompson, New York City, N. Y.
Chas. T. Peters, Cincinnati, Ohio
A. C. Stone, Chicago, Illinois
A. J. Bovier, Chicago, Illinois.

PROVIDES FOR RADIO LAW STUDY

Three fellowships of $1,500 each have been inaugurated this Fall at the Columbia University Law School by the Radio Corporation of America to provide graduates means for an additional year of study of the intricacies of Federal laws, especially of those pertaining to radio problems. The awards have been offered for one year only as an experiment. General James G. Harbord, President of the Radio Corporation, explained that the phenomenal growth of radio had brought forward new legal problems and created a need for intensive study in many branches of the law.

WHITE REPORTS ON EUROPEAN TRIP

That the proposed increase in tariff schedules now being considered by Congress would result in the loss of export business for American manufacturers of radio through retaliation on the part of European countries is the opinion of Thomas A. White, general sales manager, Jensen Radio Manufacturing company, who spent eight weeks in England and Continental Europe.

"At the present time," said Mr. White, "the import duties on American made radio merchandise are very favorable. If, however, our tariff schedules are increased to a point where European business feels it is being deliberately shut out of this country there will be a general retaliation on the part of European governments. This is my firm conviction after talking with representatives of a number of established manufacturers and distributors of radio apparatus in London, Paris, Leipsig, Berlin, Amsterdam and other leading manufacturing centers.

"The recognized progress in the United States of the radio industry causes the European manufacturer to look to this country for their improvements. This circumstance", continued the Jensen sales chief, "provides a natural market for the sales of American made radio apparatus in Europe unless the proposed tariff revisions effect it too adversely.

"It is not my impression that the radio industry in Europe is so far behind our own in the stage of its progress as it may appear, for the depressed financial condition of the European people has prevented the industry from absorbing the cost of constant developments and improvements even though they were desired. The European manufacturer and European people fully appreciate the natural advantages of radio broadcasting and reception such as we have in the United States. As the financial condition is bettered, which is being done rapidly, the market will quickly demand the best broadcasting and the finest receiving apparatus it is possible to provide.

"Short wave broadcasting," according to Mr. White, "is likely to arrive in Europe on a big scale even before it does in the United States. That incidentally may prove a boon to our own industry because it might easily mean the reception in America's homes of Europe's finest orchestras, artists and lecturers by means of short wave trans-atlantic broadcasting and re-broadcasting through our own stations."

The European market for loudspeakers of American manufacture is especially bright for, as Mr. White pointed out, the people of these countries have a deep appreciation of fine tone quality. Electro-dynamic speakers are just coming into vogue and few radio sets and phonographs have incorporated speakers of this type until this season. Now, however, the market for speakers of this type is advancing rapidly. While Mr. White was in Europe he successfully negotiated with three manufacturers for the European production of Jensen Electro-dynamic speakers.

In central Europe Jensen speakers will be manufactured by Dr. Dietz and Ritter of Leipsig, Germany, one of the most successful designers and builders of transformers and radio parts on the Continent.

The British market will be served by the Celestion company of London, an old and established manufacturer of magnetic speakers.

A branch of the English Celestion company, the Constable-Celestion company of Paris, will supply the Latin countries.

These manufacturers are to assemble Jensen Electrodynamic speakers under a royalty arrangement from parts supplied from the company's plant in Chicago. Under the agreements made these companies have exclusive right to the use of all of Peter L. Jensen's designs and patents.

"The three manufacturers," said Mr. White, "will start with an initial production of three thousand speakers a month and from my observations of European conditions we expect this output to increase rapidly."

SET UNIFORMITY

Insistence on uniformity in the quality of its products is one of the fundamental manufacturing principles of National Carbon Company, according to an official of that company. Each Eveready Radio Receiver must be like every other Eveready Radio Receiver in the same series.

Many manufacturers of radio sets are not convinced that uniform sets can be turned out in large quantities. They contend that a radio set is "different"; that there is something mysterious about it which makes it determine for itself how it shall perform. They say that the one satisfactory way for the manufacturer to control quality is by the expensive and little-used method of scrapping all finished receivers which do not measure up to standard. National Carbon takes an opposite stand.

Back of National Carbon's contention lies an amazingly complete organization, one which has taken many years to build. Some of the various divisions and departments, each of which is playing its part in making all Eveready sets of uniform quality, are:

A Research Laboratory to investigate, invent and prove the merit of radio ideas.

A Product Engineering Department to shape the theoretical ideas of the Research Laboratory into practical form, and to design the tools, jigs, and fixtures for quantity production of uniform, duplicate, interchangeable parts.

An Inspection Department to buy raw materials specified by the Specifications Department in quantities and at such time as prices are most advantageous.

A Works Laboratory to test purchased materials to insure their coming up to specifications before going into production.

A factory equipped with the latest precision machines for quantity production of parts with accuracy, and the unvarying assembly of parts with speed and precision.

A Product Development Division to keep in touch with the trade and with the trend of radio, to enable the other divisions to concentrate on the development of ideas known to be needed and wanted by the public, and to prevent wasting time on the development of ideas which, while interesting, would not make a wide appeal.

All these divisions and departments co-ordinated into a smooth-running, harmonious organization, under the direction of executives who are collectively familiar with every phase of the radio business.

With such a complete organization, control of quality follows as a natural consequence.

BROADCAST RESPONSIBILITY

By ERNEST KAUER, *President,*
CeCo Manufacturing Company

Radio is an immensely competitive industry and there is no sign that it portends otherwise. In all its various divisions there are many organizations in competition with one another; dozens of tube manufacturers, dozens of furniture manufacturers, dozens of set manufacturers, hundreds of broadcasters. I see no indication that any monopolistic organization in any of the trade divisions is on the way.

As far as it goes, that is a normal, happy and desirable state of affairs. I am confident the public gets more for its money because of this competition. Engineering, production and merchandising is more efficient when it has to compete within its own boundaries.

There is, however, a cloud on the horizon, and that concerns broadcasting. If the radio industry were in the hands of a monopoly, the broadcasting problem could more easily be remedied. This, the most important feature in the whole radio set-up, has gotten wholly out of control of the radio industry. Whereas, in the beginning of radio broadcast, at the opening of the present decade, broadcasting was dominated by the radio industry, today the industry's influence in this major activity is minor.

I believe in the commercialization of broadcasting. It should pay its own way. But I do not believe in the selfish commercial uses to which so much of the broadcasting time is at present being put. There is too much direct salesmanship and not enough consideration for the radio listener.

If this selfishness is inherent in the present system where the average broadcast sponser is more intent on selling soap, tobacco, oil or shoes than he is in the best interests of the radio public, then the solution is to make the radio industry economically responsible for broadcasting's cost.

A goodly number of radio manufacturers are represented by radio periods. Every such program sponsored by radio firms is a credit to the industry as well as a delight to the public; such hours as those furnished by Atwater Kent, Philco, CeCo, RCA, Stromberg-Carlson, Edison, Eveready, Kolster, Victor, General Electric. But there are not nearly enough of them. Every successful radio manufacturer owes a duty to the industry which allowed his success and that duty can best be met by being in the broadcast picture. At the moment I can think of no furniture manufacturer who has sponsored a radio period, though radio has been more than generous to the furniture field.

The radio industry cannot escape the responsibility for the public's response to broadcasting. It lies within the power of the institutions which compose the industry to make broadcasting what it ought to be. The manufacturing division can well afford to purchase all the time available on the larger networks; the retailing division can well afford to purchase all the time available on local stations. Or if not all, at least the major portion of the time. Controlling it thus will insure the desired appreciation of the radio public.

RAISE ADVERTISING STANDARDS

Constant efforts and much progress are being made to raise the standards of radio advertising, according to Mr. Morris Metcalf of Springfield, Chairman of the Fair Trades Practice Committee of the Radio Manufacturers Association, the national organization of all prominent makers of radio products. In cooperation with Better Business Bureaus and other organizations, Mr. Metcalf, outlining the goal of the Radio Manufacturers Association for the best ethics in radio advertising, believes that real progress is being made not only in this endeavor, but in bettering general trade practices in the selling of radio and also in adjustments of disputes between members and other interests.

"It is estimated that between $20,000,000 and $25,000,000 is spent annually by radio manufacturers in advertising channels," said Mr. Metcalf. "In the hectic and unstable days of the industry in its early years advertising excesses crept in, as in other new industries. This condition has largely become changed. There is room for improvement, of course, and it is the constant effort of the Fair Trade Practice Committee of the Radio Manufacturers Association to insure the highest standards of truth and fair dealing with the public, as well as ethical practices between members engaged in the manufacture and selling of radio products.

"The attitude of business executives toward trade associations is interesting, in so far as it indicates their belief in the advantages and benefits which their respective concerns derive from such association. Some otherwise good business men regard a trade association merely as a means of exchanging conversation and views, and apparently for banqeuting and visiting, and lend their support more because they do not want to be left out or because their competitors are members.

"It seems to me that even a superficial study of the aims and accomplishments of existing trade associations should convince the most skeptical of their immense value to their members, and the industry as a whole, to say nothing of their importance as a means of expressing, nationally, for political or commercial ends, the views of their respective industries. If the standard of commercial integrity in this country is higher today than it was twenty years ago, it is due in a large measure, I am sure, to the efforts of well-managed trade associations.

"The sincere personal acquaintances and friendships that result through association work tend to eliminate a good deal of sharp practice, false statements, and unfair competition among the members.

"The Fair Trade Practice Committee of the Radio Manufacturers Association endeavors to right such business wrongs, as are contrary to the ethics of good business practice, as may be brought to its attention. In cooperation with Better Business Bureaus and other organizations, it attempts to eliminate false and misleading statements in advertising, and to prevent as far as possible the deception of the public in radio matters.

"The Association, of course, has no power over its members in this respect, but in many cases deceptive statements in advertising are the results of thoughtlessness and enthusiasm rather than intent, and frequently it is only necessary to bring such matters to the attention of the executives of a company to obtain correction.

"The radio industry is peculiar in many ways, and because it deals with a newly-discovered force and highly technical apparatus, the public knows very little about it and is easily misled and confused regarding radio merchandise. Therefore, there is more than the usual need for frankness and fairness in our dealings with the public, and I am glad to say that, in the main, members of the Radio Manufacturers Association practice this policy."

FROST HEADS NEW MERGER

Major Herbert H. Frost, one of the outstanding leaders in the radio industry, has been elected president of the Utah Radio Products Company of Chicago, and in that capacity will direct the destinies of the new group to be formed by a merger of the Utah company and several other well known radio parts manufacturers.

Two of the companies to be acquired by exchange of stock are the Carter Radio Company of Chicago and the H. H. Eby Company, Inc., of Philadelphia. Other units are to be acquired at a later date.

All units in the merger plan are to maintain their separate identities and managements, Major Frost stated. The Utah company will act as the holding company for the consolidation.

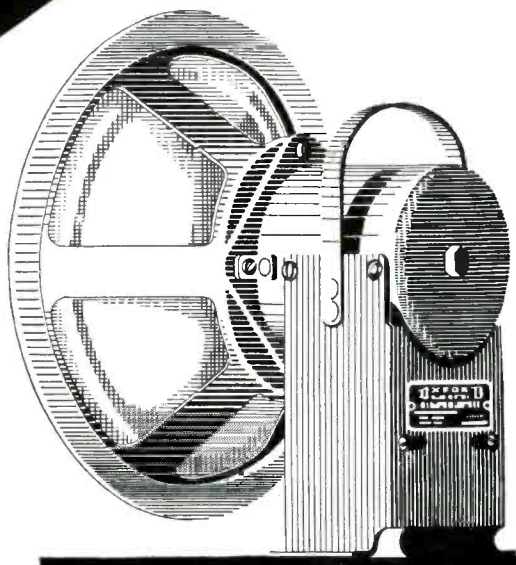
Major Frost, who was three times president of the Radio Manufacturers' Association, and recently resigned as vice president and general manager of the Kolster Radio Corporation of Newark, N. J., prophesied an unusually strong radio parts organization as the result of the merger. On October 28, a special meeting of Utah stockholders was held in Chicago to act on the recommendation for an increase in the company's stock from 250,000 shares of no par value to 1,000,000 shares of par value, and to increase the board of directors from seven to fifteen. The new stock issue will be used to acquire the other units.

Major Frost issued the following statement: "I feel that I have been highly honored and am not unmindful of the responsibilities as well as the opportunities made through this merger.

"The units making up the combination have been very successful during the past five years and have established an enviable position in their respective fields. They have specialized on certain parts and accessories and the combined sales reflect a very substantial position for the new company. This sales volume has also reflected excellent earnings due to the high degree of efficiency injected into each unit by its management. The new company will continue the present management of each unit and these executives will make up the Board of Directors of the new corporation.

"Radio receiving set manufacturers have found it difficult in the past to secure sufficient quantities of properly designed units for use in constructing radio receivers. The present plans of the new company call for the immediate reallocation of manufacturing facilities and products in order that eastern manufacturers may be supplied from an eastern plant and western manufacturers from a western plant. This gives the set manufacturer a good margin of safety as in case one plant is temporarily shut down due to fires, strikes, etc., the other plant is able to supply the same identical product, designed by the same engineers.

SPEAKER by OXFORD



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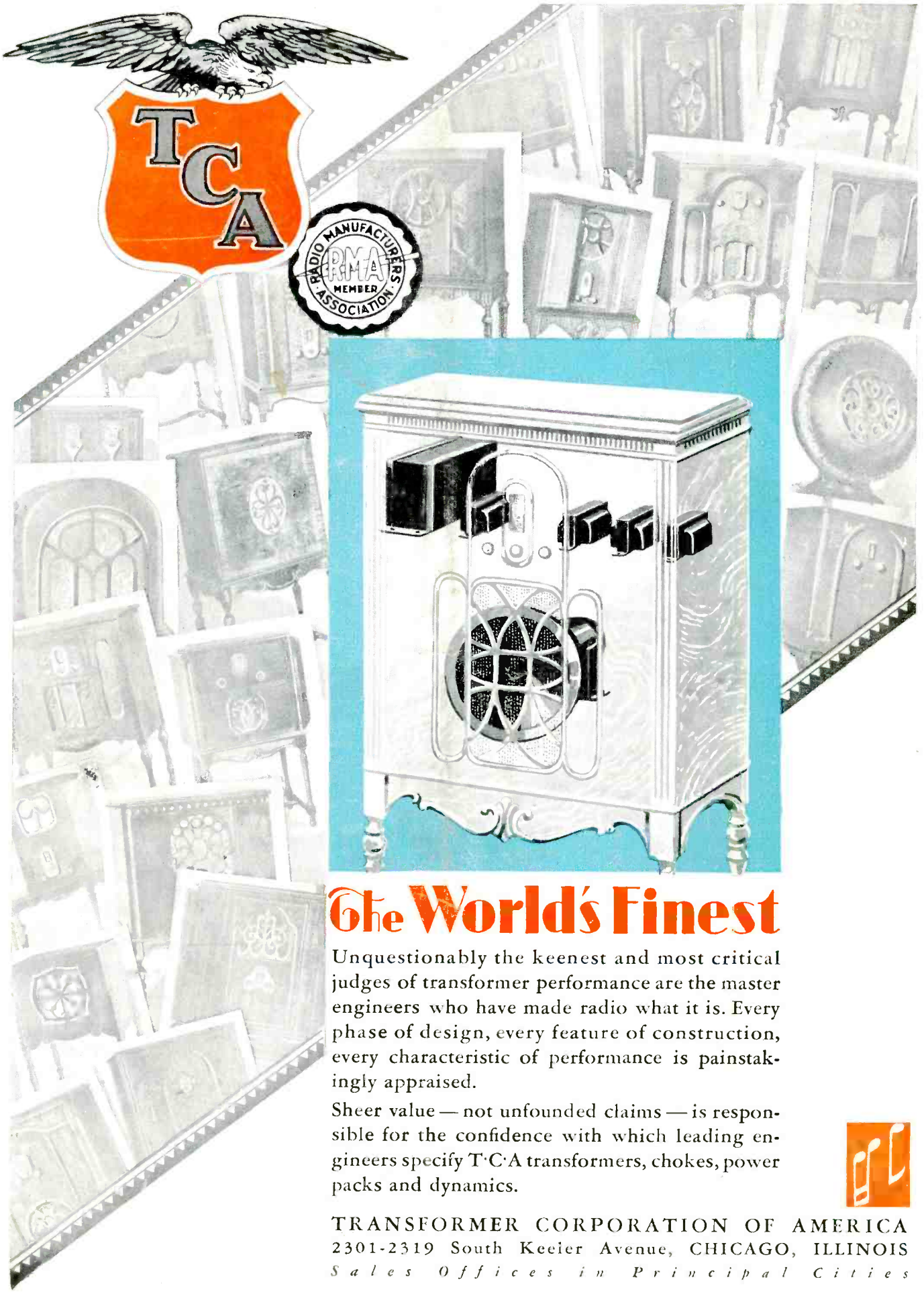

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