

PROGRAMS NEWS

HOOK - UPS COMMENT

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Laying Out Scanning Disc Requires Great Accuracy

If Holes Are "Off," Dark or Light Streaks Will Mar Reproduction of Image.—Directions Given for Construction of 24 and 48-Hole Combination

BY CHARLES NEWTON KRAUS (President, Brown University Radio Club.)

Having described in our last article the functions of the neon tube, we now turn our attention to the scanning disc, another important item in television transmission and reception.

The scanning disc, as has been pointed out in the preceding article, is revolved by a motor. In order to bring the picture "in phase," the disc must be revolving in perfect synchronism with the disc of the broadcasting station.

Some television transmitting stations now on the air use 24-hole discs. Others use 48-hole discs. In consequence, the writer has a combination disc, perforated with two spirals, one of 24 holes and the other of 48 holes.

When reception from a station with a 24-hole disc is desired, the neon tube is placed so that its glowing plate, or electrode, is immediately behind the 24-hole spiral. This means bringing the neon tube toward the center of the disc, which is shown in the accompanying illustration. Hole No. 1 is even with the top of the glowing plate and hole No. 24 is even with the bottom.

The disc is then placed in operation. As it gathers speed the holes have the effect of merging in front of the glowing electrode of the neon tube. Intervening spaces disappear, just as do the spokes of an automobile wheel revolving at high speed.

Soon the spectator sees the 1 1/2-inch glowing plate in its entirety. And, if the disc is revolving in perfect union with the transmitting disc, he sees the image that is being transmitted. How clear and sharp and distinguishable it is depends, for one thing, upon the accuracy with which the spiral of 24 holes is laid out.

This is true of the 48-hole spiral, shown near the circumference of the disc pictured in the accompanying illustration. When 48-hole reception is desired, the neon tube is placed so its glowing plate is directly back of the 48-hole spiral. Hole No. 1a is even with the top of the plate. Hole No. 48a is even with the bottom.

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On display at Kingston, Fair  
Main Radio and Jewelry Co.  
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be divided by 24. The quotient is 1/4 of an inch, or the proper diameter of each of the 24 holes.

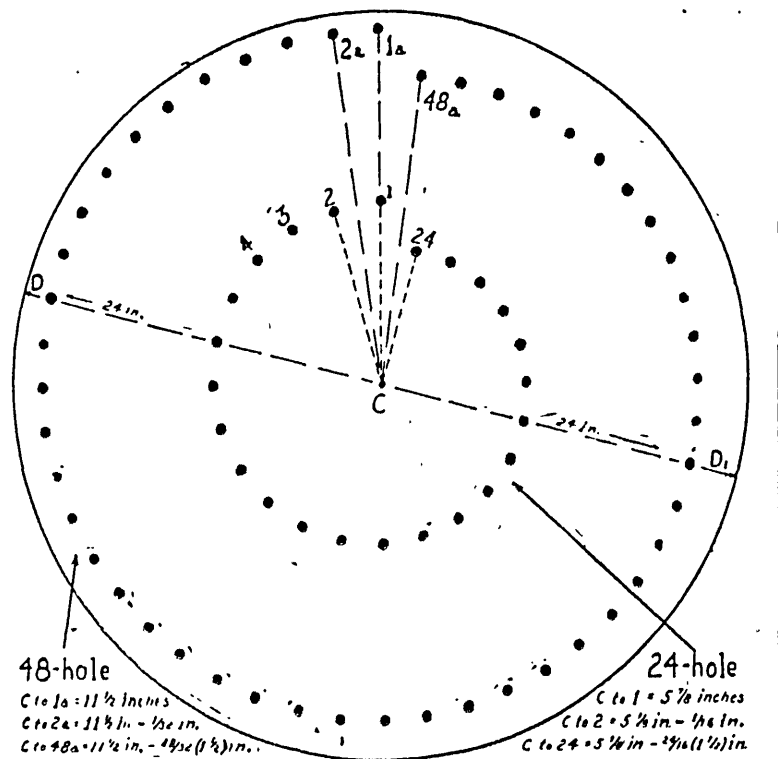
The same procedure is followed in the laying out of the 48-hole spiral, except that 48 radial, cutting the circumference of the disc into 48 equal arcs, must be provided. This is easily accomplished by continuing the spiral necessary in the laying out of the smaller spiral to the circumference, and bisecting the 24 equal arcs they form by means of compass or dividers.

Hole No. 1a is exactly 1 1/2 inches from the center of the disc. Hole No. 2a, immediately to the left, is 1 1/2 inches from the center, or 1/32 of an inch nearer the center than Hole No. 1a.

Determining Hole Size.  
Each succeeding hole is 1/32 of an inch nearer the center than the preceding one. Hole No. 48a, therefore, is 1/2 inch, or 1 1/2 inches, nearer the center than Hole No. 1a. This 1 1/2 inches, as was the case in the 24-hole spiral, provides exactly the right space through which to scan the neon tube plate when the disc is revolving.

The size of each of the 48 holes is computed in the same manner as the size of a 24-hole spiral, by dividing 48 into 1 1/2 inches. The quotient in this case is 1/32 of an inch, which is the proper diameter.

After laying out the holes, the builder of the disc should punch each hole



With 24 and 48-Hole Spirals. In This Illustration, Sizes of Holes Greatly Exaggerated: Exact Sizes Are Set Forth in Accompanying Article.

mark accurately with a prick punch. Then he should drill the holes of each spiral with the proper size drill, keeping the aluminum disc on a smooth, flat surface during the operation, so there will be no ragged edges on the side from which the drill emerges.

On the scanning side of the disc, which is the side away from the neon tube (this is the side shown in the accompanying illustration), the holes should be countersunk as deeply as possible without altering the original size of the hole as it appears on the back of the disc. This permits more light from the neon tube to get through and improve reproduction of pictures. Countersinking in this case is a difficult task, and should be accomplished with great care. Countersinking is not absolutely necessary.

How to Mount Disc.  
After the holes have been marked out and drilled, then is the time to drill the center hole, which fits over the motor shaft. A bushing should be utilized. There are several types of bushings, but one with a screw thread is desirable. The bushing and hole in the center of the disc should fit tightly over the shaft of the motor to be used.

The writer uses a motor with a 1/2-inch shaft. It is a particularly quiet and easy variable speed motor, capable of revolving up to 1800 r. p. m.

More detail in connection with the motor and requirements, together with operation and speed control, will be discussed in a later article. Also will be discussed the use of aquiro holes, rather than round holes, in the scanning disc.

Radio Editor, Sunday Journal:  
Please state the difference between the dynamic and the ordinary loud-speaker.

Radio Editor, Sunday Journal:  
I have seen an advertisement of a unit which replaces the vibrator or bulb in an ordinary charger. It cost around \$45.00. Is this a practical change to make on a charger and would it be cheaper than buying a regular trickle charger?

Radio Editor, Sunday Journal:  
Kindly explain what is meant by the term "neon lamp" used in connection with television.

Radio Editor, Sunday Journal:  
The neon lamp was described in detail in the Sunday Journal of Sept. 9. It is a glass bulb containing two metal plates, or electrodes, their surfaces parallel and very close together. The bulb is evacuated and then neon gas is introduced. This will pass current electricity, causing the gas to glow brightly. The slightest variation in the strength of the current causes an immediate change in the brightness of the lamp. Thus, the lamp is a most rapid device for producing the quick changes

Today's Programs in Brief

- 6:00—Band, WEAP, 402; WGR, 303; WTWO, 517; WGY, 380; WPT, 405; WBSH, 366; WTIC, 535; WTCB, 255; WTCM, 225; WTCN, 243; WTVR, 544; WKBA, 316; WBAI, 286; WHAM, 280; WBZ, 333.
- 7:00—Music, WEAP, 402; WGR, 303; WTCB, 255; WTCM, 225; WTCN, 243; WTVR, 544; WKBA, 316; WBAI, 286; WHAM, 280; WBZ, 333.
- 7:15—Church, WPT, 405; WTWO, 517; WGY, 380; WPT, 405; WBSH, 366; WTIC, 535; WTCB, 255; WTCM, 225; WTCN, 243; WTVR, 544; WKBA, 316; WBAI, 286; WHAM, 280; WBZ, 333.
- 7:30—Church, WPT, 405; WTWO, 517; WGY, 380; WPT, 405; WBSH, 366; WTIC, 535; WTCB, 255; WTCM, 225; WTCN, 243; WTVR, 544; WKBA, 316; WBAI, 286; WHAM, 280; WBZ, 333.

RADIO PROGRAMS

- WJAR—1:30 p. m. —Peerless half hour of harmony, 2 p. m. —Summer radio church, 3 p. m. —Musical Minutes, 4 p. m. —Weymouth Post, American Legion, 5 p. m. —The Home of the Republic, 6 p. m. —Weymouth Post, American Legion, 7 p. m. —The Home of the Republic, 8 p. m. —Our Government, 9 p. m. —The Home of the Republic, 10 p. m. —The Home of the Republic, 11 p. m. —The Home of the Republic, 12 p. m. —The Home of the Republic.
- WFCI—6:30 p. m. —International Bible Study, 7:00 p. m. —The Home of the Republic, 8:00 p. m. —The Home of the Republic, 9:00 p. m. —The Home of the Republic, 10:00 p. m. —The Home of the Republic, 11:00 p. m. —The Home of the Republic, 12:00 p. m. —The Home of the Republic.
- WJAR—11:30 p. m. —The Home of the Republic, 12:00 p. m. —The Home of the Republic, 1:00 p. m. —The Home of the Republic, 2:00 p. m. —The Home of the Republic, 3:00 p. m. —The Home of the Republic, 4:00 p. m. —The Home of the Republic, 5:00 p. m. —The Home of the Republic, 6:00 p. m. —The Home of the Republic, 7:00 p. m. —The Home of the Republic, 8:00 p. m. —The Home of the Republic, 9:00 p. m. —The Home of the Republic, 10:00 p. m. —The Home of the Republic, 11:00 p. m. —The Home of the Republic, 12:00 p. m. —The Home of the Republic.

MOVIE FOLK WORRIED

Radio Pictures Cause Will Hays to Appeal to U. S. It has been reported in Washington that because of the rapid development made in the laboratory experiments of broadcasting of motion pictures into the homes, that Will H. Hays, President of the Motion Picture Producers and Distributors, had become apprehensive over the situation and had asked that the Federal Radio Commission go slow in assigning frequencies for this purpose.

Some confusion was caused by the further report that he was sending the "Governor of Maine" as his personal representative in the matter, observers of the commission wondering what that particular official could have to do with such a request. When Will Hays was subsequently approached, he was silent with regard to the television phase of it, but said: "The Secretary of our association is Carl Milliken, who was formerly the Governor of Maine. He was in Washington a few days ago and made some

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The Walter W. Massie Radio Sales and Service Bureau

16 Windsor Rd., Edgewood Telephone Broad 0507 MASSIE SERVICE "THE BIG 1/2" We sell, service and repair all standard makes of radio apparatus.

You Would Pay Nearly \$250 for the Radio Alone... BUT LOOK! MODEL 7-11

This All Electric Radiola 18 IN HANDSOME CABINET BUILT IN RADIO 100-A CONE SPEAKER WITH ORTHOPHONIC VICTROLA COMBINED ONLY \$250 ALTOGETHER

Beautiful NEW-A.C. TUBE Stromberg-Carlson

THE same glorious tone, the same sensitivity, the same selectivity for which all Stromberg-Carlson Receivers are famous. UNITED MUSIC CO. 233 Weybosset Street



RADIO PROGRAMS

Continued from Page Seven
Hunt, soprano—National Broadcasting Company feature.
10:00 p. m.—Mickey Strike Orchestra—National Broadcasting Company feature.

12:30 p. m.—Weather Report.
1:00 p. m.—Providence Journal and Evening Bulletin news flashes.
1:05 p. m.—Official Market Report of Providence Bureau of Markets, Rhode Island State Department of Agriculture.

9:15 p. m.—Same as WEAP.
9:45 p. m.—Correct time.
WHAM—ROCHESTER—250
11:30 a. m.—Church services.

7:00 p. m.—Same as WJAR.
7:30 p. m.—Same as WJAR.
8:00 p. m.—Same as WJAR.
8:15 p. m.—Baseball scores.

The Dial's Diary By the Trouble-Shooter

I wonder how many radiolists realize how much trouble I give them when I'm trying to solve some one fellow's worries. My guess is that very few people ever suspect that their troubles may be someone trying to solve some other trouble in the neighborhood.

SPEAKER LOCATION

This Has Important Effect on Quality of Reproduction
The quality of a loud speaker is partly due to the proper location. Loud speakers, as a rule, have poor acoustical properties. Speech or music emanating from the walls of the room at various angles and reflected back a fraction of a second later, not tardy enough to be noticed, but important enough to destroy the natural reproduction of the music or speech.

4th Floor THE RHODE ISLAND SHOPPING MECCA 4th Floor BOSTON STORE CALLENDER MAUSLAN & TROUP COMPANY

Announcing the new ZENITH "34" The Sensation of the Radio Show
EVEN Zenith, always a center of interest at the radio shows, has never known such enthusiasm as was awakened by the New Zenith Sets at the trade show this year.

10:30 a. m.—Hints for home-makers by Cynthia Sage program.
2:00 p. m.—Studio program.
6:00 p. m.—The family hour.

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OUR AUTO NUMBER FRAMES WILL BEAUTIFY YOUR CAR Made of heavy bronze, nickel plated 2-834

AND NOW! B. & H. Supply Co., Inc. Puts On Their Own RADIO SHOW Thursday—Friday and Saturday Evenings of this week we will have on exhibition at our showrooms, 116 Mathewson Street, Providence, the newest and finest display of radio sets that has ever been shown in Rhode Island.





Radio, as we know it, is not the first "wireless" means of communication. "Wireless" in a form unknown to broadcasting companies, has existed in Africa since the Stone Age.

of communication. In every Nigerian village where one of the sacred drums reposes before the chief's house, two men are seated listening. Sooner or later their trained ears pick up faint tap-tappings from the forest.

chain are obliged to wear tuxedos while on duty in the New York studios. The "tuxedos" are supplied by the company, and each announcer must have two suits.

GOVERNMENT MEN TALK TELEVISION

Terrell, Robinson, Caldwell, Pickard Air Their Views

Nothing Can Forestall Practical Application of Science Within Next Few Years, Belief of One. Sykes Discusses Legal Aspects Certain to Arise

ment of the art, rather than upon a real need for the service." Legal Phases Discussed.

Judge E. O. Sykes, vice-chairman of the commission, has some interesting thoughts on the legal side of television.

slight flaws may spell a poor condenser, which, while it may get by the "flash test," will soon break down in actual use.

Separate Rheostats. If a receiver is built employing radio frequency the filament of each radio frequency tube should be controlled by separate rheostats.

quires a grid return to the A plus. The amplifiers require an A minus connection. When one rheostat is used to control all three tubes the grid base is controlled by the position of the arm on the rheostat.

In Quest of D.X. Employ phones to locate distant stations. Once the stations are located, they can usually be given increased strength, sufficient to operate the loud-speaker, by manipulating the volume and tuning controls.

strength, sufficient to operate the loud-speaker, by manipulating the volume and tuning controls. Many distant stations too feeble to actuate the loud-speaker can be heard with the phones.

LAW BOOKS FOR SALE Massachusetts, New York, C. G. A. and United States Reports; First and Second Decennial Ed. Am. Digest; also other sets and text books. Call Gaspee 5037.

At the Bend in the Road The Installment Plan Folks buy a lot of things on the so-called installment plan. Most of those things naturally wear out.

RADIO AIDS POLICE One City Already Uses System to Talk With Officers Commercial use of short waves is reaching a new level of utility.

With increased activities in the television field, Government radio experts, and especially members of the Federal Radio Commission, have evidenced the greatest interest in the subject.

Suppose the broadcaster in Texas, instead of seeing the shooting affair through the window, had seen it on his radio by means of television.

The Paper Condenser. The paper condenser literally is nothing more than two strips of tin-foil separated by several thicknesses of paper.

Week-End Motor Tours Gorgeous Autumn Foliage PERSONALLY CONDUCTED TOURS To Mohawk Trail—Housatonic Valley—White Mt.—Bennington—Vt.—Cape Cod Canal—Picturesque Provincetown and Plymouth.

Be Paint-Thrifty! DRESSING up your home in the Fall with Paint and Varnish is a natural expression of self respect and the human desire to surround one's life with beauty and comfort.

Commander Byrd Chooses MAYTAGS for South Pole Expedition ONE of the many distinguished honors that have come to the Maytag Aluminum Washer is the selection of Maytags for the Byrd South Pole Expedition.

Pickard Enthusiastic. Commissioner Sam Pickard, of Kansas, says that "after witnessing several television demonstrations, I am inclined to believe that nothing can forestall the practical application of this marvelous invention within the next few years."

Harold A. LaFount, radio commissioner from Utah, is another member of the Commission who has expressed much interest in television.

I am greatly interested in television, he said. "The different methods employed to produce the same result afford a most interesting study."

Successful experiments and demonstrations, continued Mr. LaFount, "prove conclusively the feasibility of the methods in use at this time. However, perfection is not yet in sight. In my opinion, it will require a few more years of hard work, study and experimenting before the goal will be reached, and before it will have any material value."

Week-End Motor Tours Gorgeous Autumn Foliage PERSONALLY CONDUCTED TOURS To Mohawk Trail—Housatonic Valley—White Mt.—Bennington—Vt.—Cape Cod Canal—Picturesque Provincetown and Plymouth.

Commander Byrd Chooses MAYTAGS for South Pole Expedition A Fitting Tribute to the New Maytag on its First Anniversary The noteworthy tribute of being selected for the Byrd Expedition comes to the New Maytag as it is celebrating its first anniversary—the end of the most remarkable year in Maytag history—a year in which the number of Maytags in use passed the million mark.

Commissioner Sam Pickard, of Kansas, says that "after witnessing several television demonstrations, I am inclined to believe that nothing can forestall the practical application of this marvelous invention within the next few years."

for first aid Absorbine Jr. apply full strength cooling soothing antiseptic



Take a Little Walk Along "Real Estate Street" If all the properties of any kind that are for sale or rent in this city were gathered together on one street—we'd advise you to take a stroll out that way.

Maytag Aluminum Washer



### HOW TO GO ABOUT "TUNING UP" RADIO

Like Automobile, Receiver Can Be Given Additional "Pep"

**A and B Batteries or Power Unit Should Be Tested to See They Are in Pink of Condition.—New Tubes Should Be Substituted for Worn Ones**

Your radio set, like your automobile, can be "tuned up" once in a while for greater enjoyment. And here is how you should go about this "tuning up" or "pepping up" process:

First of all—let's look at the batteries. If the set still happens to be operating on batteries, we should examine the A battery. If of the dry-cell type, we should measure the voltage of each cell, which should be 1.1 volts at the very least, and preferably much higher. When dry cells become weak through long use, they become noisy as well as low in voltage.

In the case of the storage battery, we should make sure that the cells are in good condition. The voltage should read not less than 1.9 for a fully-charged cell, and 2.2 for a fully-charged cell. If the voltage drops below 1.8 and does not pull up even after a charge, that cell is about through. If the battery is still in fair condition, the cell may be rebuilt. Otherwise, a new battery is in order. Of course, the battery should be kept filled with distilled water.

The next step is to look at the B batteries. These should be discarded when they reach 30 volts, although some authorities suggest going as low as 37. The fact remains that run down B batteries are noisy.

In the case of radio power units, one should be sure that they are kept in the pink of condition. Rectifier tubes should be replaced at least once a year. Water should be placed in wet units to make up for evaporation.

The tubes should be tested. In the absence of an emission metre the best stunt is to purchase a new tube of each type employed in the receiver and then compare the old tubes with the new tubes, replacing those which are "low." The old tubes can probably be reactivated for additional service. If of the thoriated tungsten filament variety, it is also a good stunt, occasionally, to disconnect the minus B wire, and then burn the filaments at a slightly increased voltage for an hour or so, as a mild form of reactivation. This often helps out quite a bit.

The antenna and ground should be looked over for improvement. Is the antenna as long as it might be? Is it free of surrounding objects, such as foliage of trees, walls, steel structures, etc.? How about the ground? Is it clean? Is it made to a really good "ground"? Antenna wire of the bare variety becomes corroded in due course, which causes high resistance for the radio-frequency currents. An enameled antenna wire is preferable in all cases.

### Vagrant Waves of Interest to Fans

Be sure to apply the proper C voltage or grid bias on power tubes, not only for good tone quality and minimum plate voltage, but also to insure long tube life.

Don't use oil to lubricate condenser bearings. Easy operation is a matter of bearing adjustment only.

Mexico has about 20 radio stations. More women than men buy radio sets in retail stores of New York city.

The radio vote in the presidential campaign is coming to be known as the silent vote.

Roumania's first broadcasting station is to be erected this year at Bucharest. The transmitter will broadcast on any wave length between 200 and 545 metres. The station will have a power of 12 kilowatts.

Aviation experts in France are at work perfecting better radio apparatus for use on airplanes. A new outfit weighing 85 pounds is being tried out by the Government's aeronautic service.

A closet hook of the flapping wing style is a convenient rest for the soldering iron.

Good transformers, with proper tubes and ample power, will give not only equal, but better, tone quality, and with far more power in addition.

When the elements of the tube are not firmly held in place, it becomes microphonic. This condition is due to vibration. The noises can be prevented by sponge rubber mountings, anti-howl caps and other devices.

With the aid of receiving sets, fishermen in Nova Scotia keep in daily contact with the civilized world. In the past, these fishermen were forced to spend many weeks each year on the fishing banks, their only communication with the world being the occasional speaking of a passenger vessel or the arrival of a vessel from home.

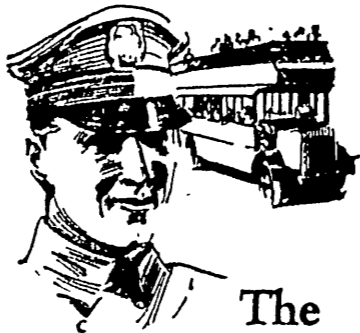
**Why Poor Tone Quality.** A run-down C battery is one of the main causes of poor tone quality in a receiver. When in search of trouble, the battery should be tested before anything else is inspected.

**Bolts Paralyze Tubes.** Heavy charges induced in the antenna by near-by lightning bolts are likely to paralyze the tubes, which will never be the same after such an experience, even if they are reactivated.

**Life of Tubes** The average life of a vacuum tube is about 1000 hours. Tubes will give just so many hours of service, no matter whether they are used five hours a day or two hours a day.

**Plug in Power Last** In setting up electric sets for operation, be careful to plug in the power

last and see that the low amperage fuse is in place in the power unit before lighting the tubes.



### The Bus Driver

Buses have to operate on schedule and we make sure of dependable service by using Champion Spark Plugs.

Champion is the better spark plug because it has an exclusive sili-manite insulator specially treated to withstand the much higher temperatures of the modern high-compression engine. Also a new patented solid copper gasket-seal that remains absolutely gas-tight under high compression. Special analysis electrodes which assure a fixed spark-gap under all driving conditions.

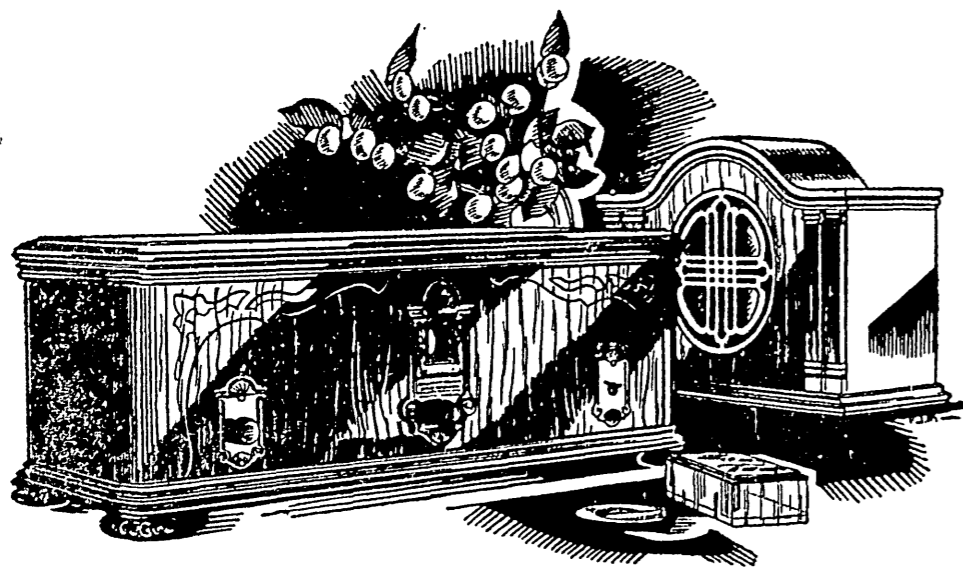


**CHAMPION Spark Plugs**  
Toledo, Ohio  
Dependable for Every Engine

**THE Brunswick RADIO**  
On Sale in Our Talking Machine Store Third Floor  
**THE OUTLET Company**

## in MUSIC... in Radio

More to choose from on Brunswick than any other manufacturer offers!



**BRUNSWICK** this year offers Radio built to the same high musical standards as the Brunswick Panatrop. Just as the Brunswick Panatrop by its marvelously natural tone, set a new standard in recorded music, so Brunswick Radio changes all present conceptions of how beautiful broadcast music can be. Tone is natural beyond comparison. Bass and high notes are in their exact natural relation. Cabinets are of the fine design and workmanship for which Brunswick is noted. Instruments have the latest convenience features: light socket operation, simplified tuning, etc.

Before you buy anything in either 'radio or record-music' this year, see and hear Brunswick's new achievements. Prices from \$25 to \$995.

**Brunswick**  
Panatropes • Radio • Records • Panatrop-Radiolas

THE BRUNSWICK-BALKE-COLLENDER CO., Chicago • New York  
BOSTON BRANCH—314-316 Stuart Street  
Phone LIBERTY 5737—5738—5739—5794

FULL LINE OF  
BRUNSWICK RADIOS AND VICTROLAS  
**PRUEFER PIANO CO.** 559 WESTMINSTER ST., Cathedral Sq.

Above—Brunswick Super-heterodyne, Model 5N0. This 9-tube set embodies the latest technical developments in the entire radio field. Used in conjunction with the electro-magnetic type Brunswick Speaker shown above, it gives you a quality of tone that will amaze you by its beauty. Complete light socket operation. One dial tuning. Price \$175, less tubes. Brunswick Model "A" Speaker \$35.



Free! "What's New in Music and Radio" This booklet tells you, write for your copy today. Address Dept. 459, 623 S. Wabash Ave., Chicago.

# At \$1185

## THE NEW

# STUDEBAKER Dictator

## includes ball bearing spring shackles

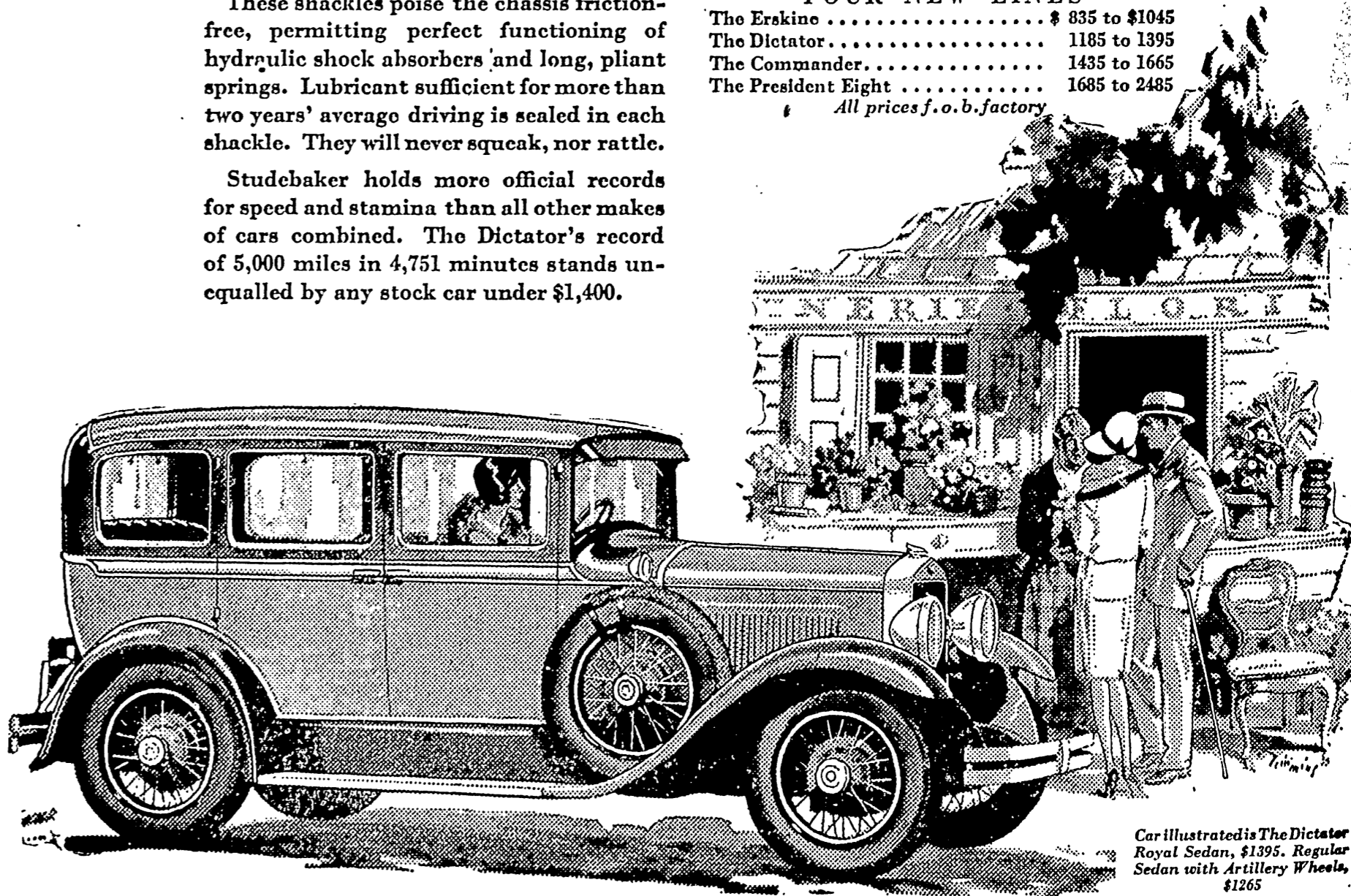
**R**IDING comfort, such as Studebaker alone can offer, is yours in full measure in the smart, new Studebaker Dictator at \$1185. For not only The President Eight and The Commander, but also Dictator models are equipped with Studebaker's exclusive ball bearing spring shackles.

These shackles poise the chassis friction-free, permitting perfect functioning of hydraulic shock absorbers and long, pliant springs. Lubricant sufficient for more than two years' average driving is sealed in each shackle. They will never squeak, nor rattle.

Studebaker holds more official records for speed and stamina than all other makes of cars combined. The Dictator's record of 5,000 miles in 4,751 minutes stands unequalled by any stock car under \$1,400.

New styles, new lines, new colors, new comfort—at a price possible only because of Studebaker's One-Profit manufacture. And behind it, 76 years of building quality transportation. Come—drive a Dictator—you'll want to own one if you do.

STUDEBAKER'S FOUR NEW LINES	
The Erskine .....	\$ 835 to \$1045
The Dictator .....	1185 to 1395
The Commander .....	1435 to 1665
The President Eight .....	1685 to 2485
All prices f.o.b. factory	



Car illustrated is The Dictator Royal Sedan, \$1395. Regular Sedan with Artillery Wheels, \$1265

## H. W. TYAS COMPANY

Distributors

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