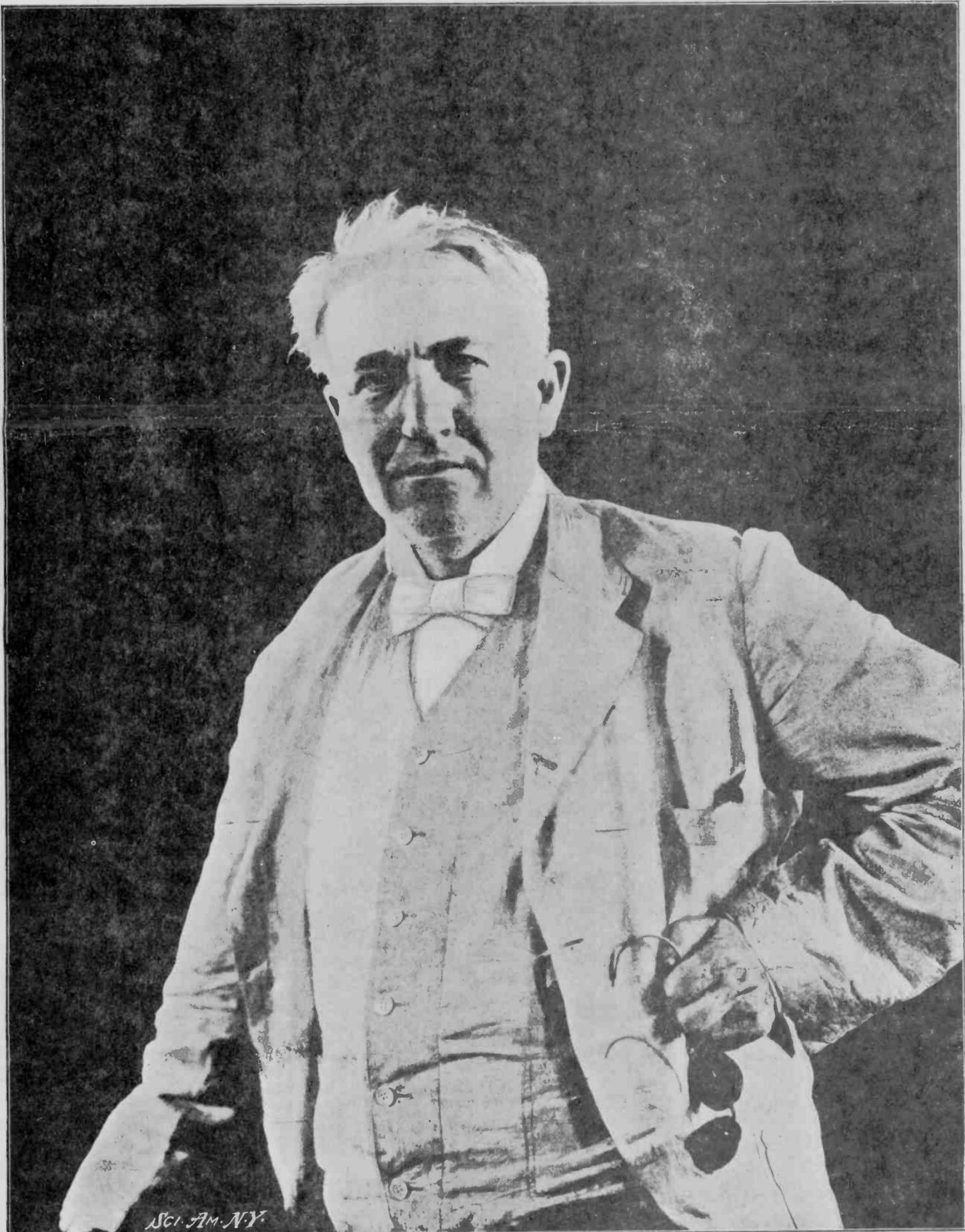


THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER

A Merry Christmas
and Good Wishes

SCIENTIFIC AMERICAN, December 27, 1902, P. 457



Sci. Am. N.Y.

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Thomas A. Edison

Radio DAYS

BY J. W. F. PUETT

Uncle Odis sat back recalling the golden days of old time radio. An era long before transistors and printed circuits invaded the manufacturing scene. The gentle days of king size tubes, wet electrolytic "condensers," and the hand wired chassis. He had been Design Engineer for the Watterson Company in Dallas, Texas. Under the ownership of John Watt Davis, Sr., this firm manufactured radios in the thirties and forties.

It all started with the Radio Bargain House in the early thirties. Many radio manufacturers ended up on the rocks in those post-depression days. When a manufacturer declared bankruptcy, the Radio Bargain House purchased their radios in large quantities at prices far below manufacturing cost. Uncle Odis can remember the day when they purchased a car load of McMurdo Silver consoles which originally retailed

for over three hundred dollars each. These chrome plated beauties were delivered and installed all over Dallas for only \$49.95.

In the middle thirties, J. W. Davis, Sr., started manufacturing a superheterodyne radio which was called the Peacock Special. When these sets were placed on the market, R. C. A. demanded that Davis purchase a license, since they held the patent for the superheterodyne circuit. Using his middle name, Watt, Mr. Davis coined the name Watterson, "Watt & Son", his son having the same name as his, John Watt Davis. A license was purchased under the name Watterson Radio Manufacturing Company.

Through the thirties and forties, they manufactured battery operated radios for use on farms where no commercial electric power was available. They also manufactured conventional ac operated sets. Many of the battery operated sets used a vibrator power supply similar to the type used in older automobile radios. These sets were operated by storage batteries. In that time period, many farmers relied on wind driven generators

to charge storage batteries which provided their only source of electric power.

After the second World War, the Watterson Company was purchased by a Chicago firm which continued operations in Dallas. This company declared declared bankruptcy about two years later, and J. W. Davis, Sr., was appointed receiver of the Watterson assets.

Mr. Davis then took out a new license with R. C. A. in the name of Davison Radio Manufacturing Company. He again coined a name—Davison from "Davis & Son." Only a few radios were manufactured under the name Davison before the death of Mr. Davis, Sr.

After that time, the J. W. Davis Company was formed by J. W. Davis, Jr. This firm still manufactures speakers and speaker enclosures.

Dallas golden days of radio are only a memory now. Uncle Odis is retired and J. W. Davis, Jr., passed away recently, but the little Watterson radio in my collection will always have a nostalgic place in the history of radio.

LETTERS

Gentlemen:

Could you help me with the following questions?

1. What is the current value of an Atwater Kent Model 10? \$100.00 to \$275.00.

2. What is the current value of a DeForest type LS 300 Horn-speaker?

3. Do you know anyone who would rewind my power transformer for a RCA Radiola Model 60.

Sincerely,
Gene H. Mottern
313 Royal Drive
Kingsport, Tenn. 37663

EDITOR'S REPLY: Someone please help.

Dear Sirs:

I recently acquired an RCA Victrola, Model VV-IX Serial # 305071G, which is a crank-up with 2 doors in front for volume control (opening & closing). I wrote to RCA in N. Y. for information about the unit, who gave me your address. I would like any information you could give me about the

set, i. e. present worth, original price, original specifications. I would also like to know, where is any place that could repair it, should something go wrong (it is in perfect operating condition at the present). Thank you very much.

Sincerely yours,
Paul H. Feuerstein, DMD
25 Royal Crest Drive
Marlboro, Mass. 07152

Dear Jim:

Just got a letter from Don Knotts in Hillsboro, Oregon. He has found a 1935 Zenith Stratosphere Radio Mod. 10002.

The cabinet was destroyed, and he heard that someone in Texas has one which belonged to the Governor of Arizona or New Mexico. He needs a description of the cabinet, or a photo.

Do you know of this radio? Don would appreciate hearing from its owner (if he exists).

Hope you can help.

Cheers,
Bob Lucas
9014 Mahoning
Houston, Texas 77036

Sir William Crookes

It was Sir William Crookes who first saw that the waves about which Faraday and Maxwell had theorized, and the existence of which had been proved by Hertz, might be practically applied in signalling through space. In a memorable article published in the *Fortnightly Review* in 1892, on "Some Possibilities in Electricity," he wrote:

"Here is unfolded to us a new and astonishing world—one which it is hard to conceive should contain no possibilities of transmitting and receiving intelligence. Rays of light will not pierce through a wall, nor, as we know only too well, through a London fog. But the electrical vibrations of a yard or more . . . will easily pierce such mediums, which to them will be transparent. Here, then, is revealed the bewildering possibility of telegraphy without wires, posts, cables, or any of our present appliances. . . . What, therefore, remains to be discovered is—firstly, a simpler and more certain means of generating electrical rays of any desired wave-length, from the shortest, say of a few feet in length, which will easily pass through buildings and fogs, to those long waves whose lengths are mea-

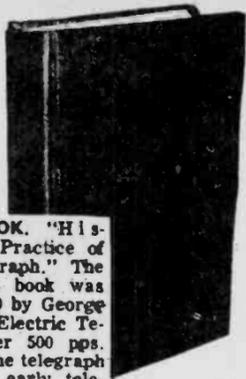
sured by tens, hundreds, and thousands of miles; secondly, more delicate receivers which will respond to wave-lengths between certain defined limits and be silent to all others; thirdly, means of darting the sheaf of rays in any desired direction, whether by lenses or reflectors, by the help of which the sensitiveness of the receiver . . . would not need to be so delicate as when the rays to be picked up are simply radiating into space in all directions, and fading away. . . .

"Any two friends living within the radius of sensibility of their receiving instruments, having first decided on their special wave-length and attuned their respective receiving instruments to mutual receptivity, could thus communicate as long and as often as they pleased by timing the impulses to produce long and short intervals on the ordinary Morse code."

It would be difficult to present a more accurate picture of radio communication both in principle, as well as in practice, than this.

A POPULAR HISTORY OF AMERICAN INVENTION
WALDEMAR KAEMPFERT, 1922
A. L. BURT CO. NEW YORK P. 358

TELEGRAPH BOOK. "History, Theory & Practice of the Electric Telegraph." The orig. copy of this book was first printed in 1860 by George Prescott, Supt. of Electric Telegraph lines. Over 500 pgs. of information on the telegraph & many illus. of early telegraph equipment. Reprints of this book \$7.50 ea., ppd.

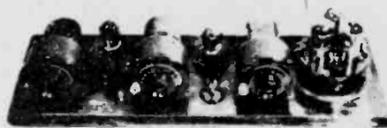


Christmas Gift



NEW 1973 VINTAGE RADIO

Enthusiastic readers bought out our first edition. Now you can send for the fascinating new edition of this pictorial history of wireless and radio, 1887-1929. It's the collector's bible, with 263 pages and over 1,000 illustrations. Available in handbook or deluxe hard cover.



McMAHON'S 1921-1932 GUIDE

Be an instant expert. Lists 9,000 radio models by maker and year introduced, with original price, description and circuit type. A must for every radio buff or antique collector.

Vintage Radio, handbook \$4.95
Vintage Radio, hard cover 6.95
McMahon's 1921-32 Radio Guide 3.95

THE FABULOUS PHONOGRAPH

From Edison to Stereo

Ever since 1877 when Thomas Edison invented a curious tin-foil apparatus to reproduce sound, the phonograph has provided entertainment and the delights of music for millions of listeners.

Roland Gelatt's history of this truly fabulous invention is a classic work in its field, and this revised edition covers new developments in stereo, recordings, and tapes.

\$6.95

All postpaid

1906 Columbia Graphophone Catalog, 32 pp., @ \$3.25

1909 Babson Bros. Edison Phonograph Catalog, 16 pp., 8x10, @ \$3.50

1896 Berliner Gramophone Instruction Manual, 8 pp., @ \$1.50

1900 Eldridge Johnson Gramophone Catalog (Consolidated), 40 pp., @ \$3.50

1902 Berliner Gramophone Catalog, 32 pp., @ \$3.25

1909 Victor Talking Machine Catalog, 32 pp., @ \$3.95

Edison Cylinder Records, 1889-1912, With an Illustrated History of the Phonograph, by A. Koenigsberg, 8 1/2 x 11, 200 pages, coll-binding, @ \$12.95

The Phonograph and How to Use It, Edison Lab Manual, orig. pub. 1900, Facsimile Edition, hard bound, 182 pp., @ \$12.95

1899 Chicago Talking Machine Catalog, 64 pp., @ \$3.25

1907 Edison Phonograph Catalog, 32 pp., @ \$2.95

Set of 5 Antique Phonograph Posters, 12" x 17", 1877-78, @ \$5.00

EDISON 1901 CATALOG \$1.50
1902 ZONOPHONE PHONOGRAPH CATALOG \$1.00
1902 VICTOR CATALOG \$1.00 NO COLOR
1906 VICTOR CATALOG \$1.00
1906 COLUMBIA GRAPHOPHONE CATALOG \$1.50

1901 IVER JOHNSON TALKING MACHINE SUPPLIES, 80 pp., @ \$4.50

1905 EDISON PHONOGRAPH OPERATING INSTRUCTIONS, 8 pp., @ \$1.75

1898 COMBINATION CATALOG (EDISON, COLUMBIA, PATHE, and BETTINI), 64 pp., @ \$4.95

The Horn Speaker Book Sales

Box 12 Kleberg, Texas 75145

Send _____ PLEASE PRINT _____

 Enclosed is \$ _____
Name _____
Address _____
City _____ State _____ Zip _____



EDISON PHONOGRAPHS 1912-13 (Cylinder Models), illustrated 5 x 8" catalog reprint. \$3.00 ppd. Satisfaction guaranteed.

EDISON'S VACUUM APPARATUS.

With the exception of the peculiar carbon used by Mr. Edison in the construction of his lamps, there is nothing of more vital importance in the development of his system of electric illumination than the apparatus employed to exhaust the air from the little globes containing the carbon horse-shoes, for upon the perfection of the vacuum depends the success of the lamp.

Since Otto Von Guericke invented the air-pump in 1650 it has been the subject of various modifications and improvements; but the most perfect forms of piston air-pump yet devised are incompetent to produce the degree of exhaustion demanded by modern experimenters.

In vacuum apparatus, as in most things connected with scientific investigation and experiment, the simplest means and methods prove the best. It seems that in the natural course of invention, simplicity is the latest feature attained. Air-pumps and vacuum apparatus form no exception to this general truth. The most recent as well as the most perfect air-pumps consist essentially of a glass tube and a column of mercury. Two forms of mercurial pump are used by Mr. Edison in removing the air from his lamp bulb; one for exhausting the greater volume of air, the other for perfecting the vacuum. The first is the invention of Geiss-

ler; the second, of Sprengel. The engraving shows the arrangement of these pumps in connection with the McLeod gauge, and other accessories.

Several sets of this apparatus are employed by Mr. Edison, and he has so far improved their construction and working as to enable the attendant to produce very high vacua in twenty-five minutes.

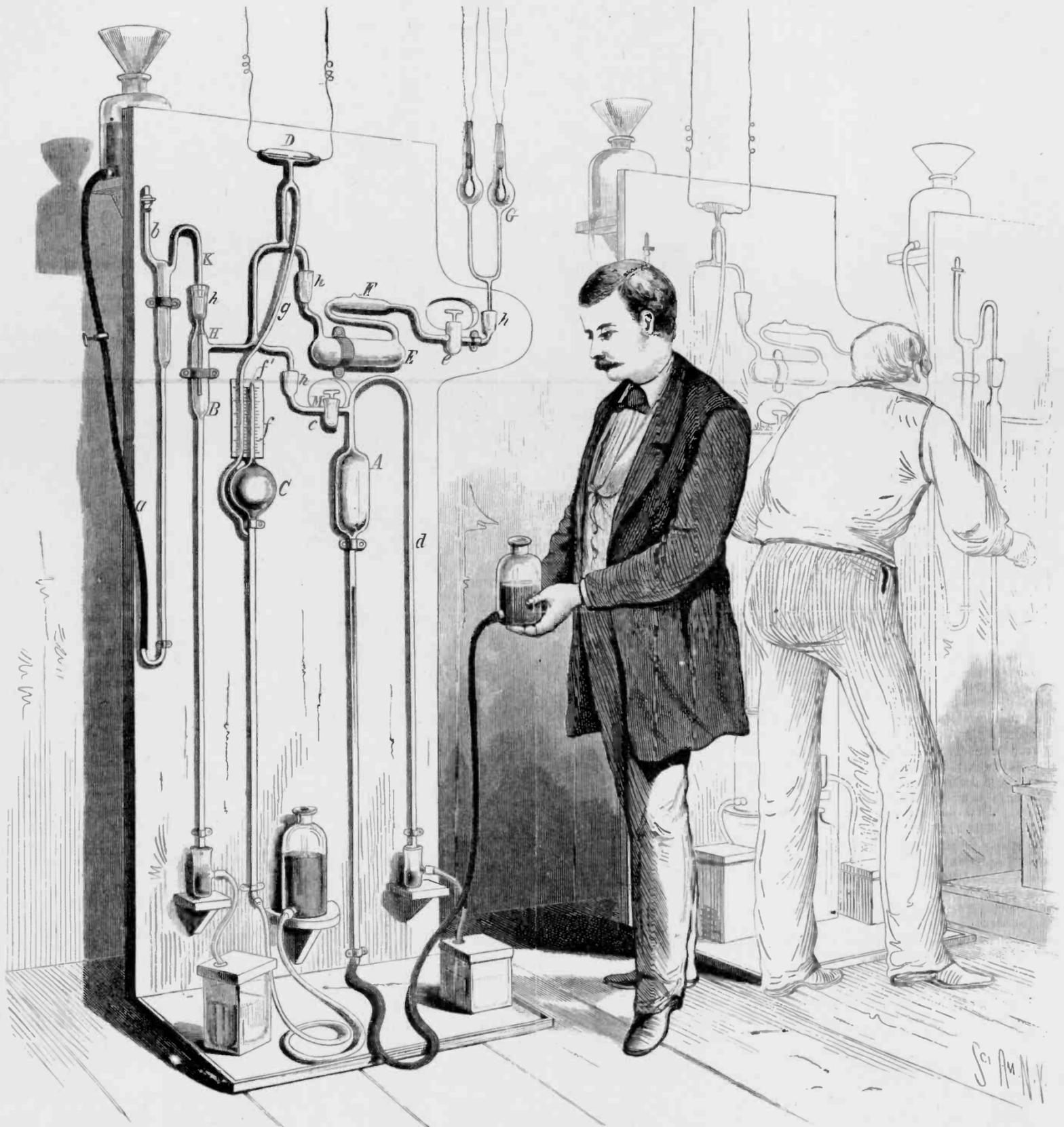
The Geissler pump, A, the Sprengel pump, B, and the McLeod gauge, C, are all connected with the socket that receives the lamp bulbs, through the bulb, E, which is partly filled with phosphorous anhydride—a powerful absorbent of moisture—and through the bulb, F, which contains gold leaf to absorb traces of mercurial vapor. Each set of apparatus is secured to a vertical board, behind which on a bracket near the top sets a reservoir of mercury, which supplies the Sprengel pump, B, through the flexible tube, *a*, and through a vertical glass tube, having at the top a trap, *b*, for receiving any air that may be carried by the mercury.

The Sprengel pump, E, consists of a glass tube about 1/2 inch in internal diameter and 36 inches in length, dipping at its lower end into mercury contained in the small vessel resting on the bracket, and having an overflow connected by a flexible tube with a mercury receiver. At the upper end of the 1/2-inch tube is formed a bulb, into which the mercury

supply tube enters through a sealed joint (described elsewhere) and extends about two-thirds of the way down the bulb. The bulb is provided with a lateral tube by which it is connected with the Geissler tube, D, and with the bulbs, E and F, which communicate with the lamp bulbs, G. The Sprengel pump also connects with the Geissler pump, A, when the stopcock, *c*, is open.

The Geissler pump, A, is simply a glass tube, having a bulb blown in it, and communicating at its lower end with a mercury reservoir through a flexible tube, and connecting at its upper end with the Sprengel pump, B, as before described, and also with a bent discharge tube, *d*, of small caliber, which extends downward something over 36 inches and dips into mercury contained in a small cup provided with an overflow.

The McLeod gauge is no more complicated than either of the pumps. It consists of a bulb, *e*, blown on the end of a tube of small diameter, and having a still smaller tube, *f*, projecting from its upper surface. This tube is closed at the top, and its capacity bears a certain ratio to that of the bulb. It extends over the face of a scale, *f*. The longer and larger tube of the gauge is connected by a flexible tube with the mercury bottle seen resting on the bracket; and it is also connected by a small tube, *g*, with the system of



A.—Geissler's Pump. B.—Sprengel's Pump. C.—McLeod's Gauge. D.—Geissler Tube. E.—Bulb containing Phosphorous Anhydride. F.—Bulb containing Gold Leaf. G.—Electric Lamp Bulbs. *a*.—Mercury supply Tube. *b*.—Air Trap. *c*. and *e*.—Mercury Sealed Stop Cocks. *d*.—Discharge Tube. *f*.—Scale. *f'*.—Gauge Tube. *g*.—Connecting Tube. *h*.—Mercury Sealed Joints.

VACUUM APPARATUS FOR EXHAUSTING EDISON'S ELECTRIC LAMPS.

tubes that connects the two pumps, the Geissler tube, and the lamp bulbs. The connecting tube, *g*, extends over the scale, *f*, parallel to and near the gauge tube, *f'*.

To produce a vacuum in the bulbs, *G*, the pinch-cock on the rubber pipe, *a*, is opened so as to permit a rapid succession of drops, or a full stream of mercury to flow down the internal tube of the Sprengel pump, *B*. This stream of mercury, falling through the space between the internal tube and the lower end of the bulb, enters the long tube of the pump, and carries with it a certain quantity of air, which is discharged together with the mercury into the cup at the bottom. As this process is too slow for creating a vacuum from the beginning, while the Sprengel pump is still working, the Geissler pump, *A*, is brought into use for removing the greater portion of the air. To operate this pump, the stopcock, *e*, is first closed, the reservoir of mercury—connected with the pump by a rubber tube—is raised by the attendant, as represented in the cut, until mercury flows up the long pump tube, and filling the bulb, drives out the air before it through the discharge tube, and finally overflows through the tube, *d*, into the cup at the lower end of the tube. The mercury reservoir is then lowered until the two vertical columns of mercury break in the bend of the discharge tube, and the mercury in the pump is below the stopcock, *e*, the latter is then opened, and the mercury reservoir is lowered until the mercury in the pump will sink no farther. The stopcock, *e*, is then closed and the operation is repeated two or three times. The Sprengel pump, which has been in operation meanwhile, is now permitted to finish the work. As the vacuum becomes more and more perfect the mercury rises in the pump, and when the drops strike the mercury column, a sharp metallic clink is heard, indicating that the atmospheric resistance to the falling metal is little or nothing. As fast as the mercury accumulates in sufficient quantities in the reservoir below, it is poured into the reservoir above.

Electric sparks from an induction coil are continually

Fig. 2.

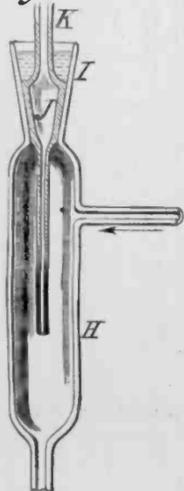


Fig. 3.



passed through the Geissler tube, *D*, as long as the vacuum is low enough to admit of it. Mr. Edison says that when a 9 inch spark fails to pass the $\frac{1}{8}$ inch space between the electrodes in the tube the vacuum is still coarse.

The McLeod gauge is relied on mainly for testing the perfection of the vacuum. This gauge is operated by simply raising the mercury reservoir connected with it until the gauge bulb is sealed off from the other parts of the apparatus, the mercury, as it rises, closing the connecting tube, *g*. The mercury reservoir is then raised still further, until the mercury will go no higher in the gauge tube, *f'*. Should the mercury rise to the end of the gauge tube it would indicate a perfect vacuum, but this is never attained. The quantity of air contained in the tube, *f'*, indicates exactly the proportion of the air in the apparatus to the capacity of the apparatus or air at its normal density. Another method of calculating the value of the vacuum is based upon the difference in the level of mercury in the two tubes in front of the scale, *f*.

Mr. Edison informs us that the vacuum in his lamps is so nearly perfect that only a millionth of the original volume of air remains.

It is obvious that the Sprengel and Geissler pumps must be longer than a barometer, to obtain the full effect of the falling column of mercury. All of the rigid parts of this apparatus are made of glass, and wherever there is a joint or a stop cock, it is sealed with mercury. Figure 2 shows the upper portion of the Sprengel pump in detail, and also gives a good idea of the manner of sealing the joints. The bulb, *H*, has a conical mouth, *I*, into which is fitted and ground the enlarged portion, *J*, of the mercury tube, *K*. The space in the mouth, *I*, above the enlarged part of the tube, *K*, is filled with mercury.

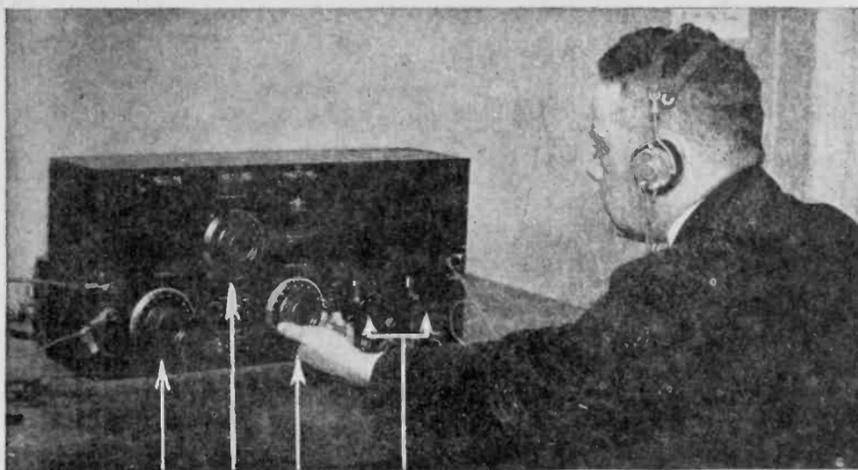
Figure 3 represents a mercury-sealed stop cock, *L* being the stop cock, entirely surrounded by mercury contained in the cup, *M*.

The lamp bulbs, *G*, are connected with the apparatus by a joint similar to that represented in figure 2. From time to time, while the air is being exhausted from the lamps, they are tested by connection with wires from the electrical generator. When the vacuum is practically complete, the tubes connecting the lamps with the vacuum apparatus are heated by a spirit lamp, sealed and separated from each other and from the apparatus.

In 1924 President Calvin Coolidge's Lincoln Day address in New York City was radioed by WEAJ, WCAP, WJAR, WJZ and WGY to 5,000,000 people, the largest audience ever reached by man.--(Photo by Int. Newsreel.)



POPULAR RADIO, May 1922, P. 38



- (A) COUPLING
- (B) REGENERATION
- (C) TUNING
- (D) RHEOSTATS

How to Tune a Regenerating Receiver

By EDGAR H. FELIX, A. I. R. E

Have You Ever Heard Clearly Over Your Radiophone One Day—and Been Disgusted with the Results the Next? The Chances Are That Your Adjustments Were Faulty

THE sudden awakening of popular interest in radio telephone broadcasting and the consequent demand for receiving sets has placed thousands of delicate bits of mechanism in the hands of novices who have had no experience in adjusting them. The average novice regards the problem of adjusting his set as merely a matter of setting his controls in such a way that will enable him to hear the station he wants.

This haphazard and illogical method of tuning, although it may bring results after a fashion, robs the listener of much of the joy of receiving. Unskilled tuning results in weak signals, interference and uncertainty.

The tuning of a radio receiver is simple enough if the functioning of the few simple controls are known to the operator.

The usual regenerative vacuum tube receiver has the following controls, as illustrated in the diagram at the top of this page:

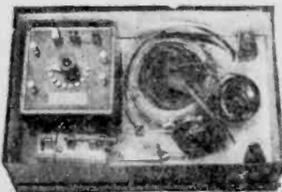
- A Coupling.
- B Regeneration.
- C Tuning { Antenna wavelength,
Secondary wavelength.
- D Filament rheostats.

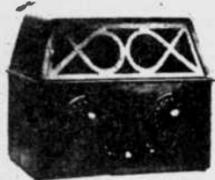
In some sets on the market, controls A and C are combined in a single control which adjusts the wavelength of both primary and secondary circuit. Some of the sets of the more inexpensive types are designed without a secondary circuit,

From a 1922 ad

ATLANTIC JR.
CRYSTAL RECEIVER
Ready for
Installation **\$18**

ATLANTIC INSTRUMENT CO., INC.
33-21 Park Row, New York





TRADE NAME: Master Craft Grand.
MODEL: 14-4.
TYPE: One-stage tuned radio frequency.
TUBES: Four.
BATTERIES: "A," 6-volt storage; "B," 90 volts.
CONTROLS: Two.
AERIAL: Outside or inside.
PRICE: \$85.00 without accessories.
MANUFACTURER'S NAME: LaMar Manufacturing Co., Inc.



TRADE NAME: "Master Craft Junior."
MODEL: 12-4.
TYPE: One-stage tuned radio frequency, detector and two audio.
TUBES: Four.
BATTERIES: "A" storage; "B" 90 volts.
CONTROLS: Two.
AERIAL: Outdoor or indoor.
PRICE: \$60.00 without accessories.
MANUFACTURER'S NAME: LaMar Manufacturing Co., Inc.



TRADE NAME: "Master Reflex."
MODEL: 1-V.
TYPE: Reflex with crystal detector.
TUBES: Four.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Indoor or outdoor.
PRICE: \$100.00 without accessories.
MANUFACTURER'S NAME: Biltmore Radio Company.

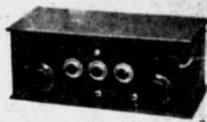
TRADE NAME: "Master Reflex."
MODEL: V.
TYPE: Reflex with fixed crystal detector; four stages radio frequency amplification and three stages of audio frequency amplification.
TUBES: Five.
BATTERIES: "A," "B" and "C" required.
CONTROLS: Three.
AERIAL: Indoor or outdoor.
PRICE: \$125.00 without accessories.
MANUFACTURER'S NAME: Biltmore Radio Company.



TRADE NAME: Melco Supreme.
TYPE: Two radio, detector and two audio.
TUBES: Five.
BATTERIES: None furnished.
CONTROLS: Three.
AERIAL: Outside or inside.
PRICE: \$150.00 without accessories.
MANUFACTURER'S NAME: Amaco Products, Inc.
NOTE: The price of the slant panel type is \$165.00.



TRADE NAME: "Microdync."
MODEL: 350-EM.
TYPE: Two radio frequency, two detectors; two audio frequency and oscillator with built-in loud speaker.
TUBES: Seven.
BATTERIES: "A," "B" and "C" needed.
CONTROLS: Two.
AERIAL: Loop.
PRICE: \$400.00 without accessories.
MANUFACTURER'S NAME: Lakeside Supply Company.



TRADE NAME: "Midland Radio Frequency Receiver."
TYPE: Radio frequency, detector and audio frequency.
TUBES: Four.
BATTERIES: Not furnished.
CONTROLS: Two.
AERIAL: Indoor or outdoor.
PRICE: \$35.00 without accessories.
MANUFACTURER'S NAME: Midland Electric Mfg. Company.



TRADE NAME: Miraco.
MODEL: "R."
TYPE: Tuned radio frequency circuit.
TUBES: One.
BATTERIES: Dry cells.
CONTROLS: One.
AERIAL: Outdoor.
PRICE: \$14.35 without accessories.
MANUFACTURER'S NAME: Midwest Radio Corporation.



TRADE NAME: Miraco.
MODEL: R-3.
TYPE: Tuned radio frequency circuit.
TUBES: Three.
BATTERIES: Not furnished.
CONTROLS: One.
AERIAL: Indoor and outdoor.
PRICE: \$29.50 without accessories.
MANUFACTURER'S NAME: Midwest Radio Corporation.

TRADE NAME: Miraco.
MODEL: MW.
TYPE: Tuned radio frequency circuit.
TUBES: Four.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Outdoor and indoor.
PRICE: \$54.50 without accessories.
MANUFACTURER'S NAME: Midwest Radio Corporation.



TRADE NAME: Miraco.
MODEL: Ultra-5.
TYPE: Tuned radio frequency circuit.
TUBES: Five.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Outdoor and indoor.
PRICE: \$75.00 without accessories.
MANUFACTURER'S NAME: Midwest Radio Corporation.



TRADE NAME: "Mohawk."
MODEL: VA.
TYPE: Five-tube single control.
TUBES: Five.
BATTERIES: "A" and "B."
CONTROLS: One.
AERIAL: Outside or inside.
PRICE: \$150.00 without accessories.
MANUFACTURER'S NAME: Mohawk Electric Corporation.



Radio News for March, 1925

with the consequent sacrifice of selectivity. However, in all cases the process of adjustment is somewhat similar.

There are three adjustments which are made before the operator attempts to receive any particular station:

First, the aerial switch is placed in the receiving position;

Second, the filaments of the tube or tubes are lit, either by means of special switches employed for the purpose or by the automatic jack, which completes the filament circuits when the plug connected with the telephone receivers is inserted in the jack.

Third, the adjustment of the filament rheostat. This is gradually turned up until a slight hiss or roar is heard in the receivers. The resistance is then turned back slightly until that noise is just inaudible.

The operator is now ready to tune his set. The control knob, marked "regeneration" or "tickler," is placed at minimum.

The first step in tuning for a particular station is to adjust for wavelength. In most of the receivers that are being sold for broadcasting there is but one adjustment for this purpose; with such sets it is merely necessary to turn slowly from minimum to maximum, stopping at any point where a desired station is heard.

Some receivers are equipped with a vernier adjustment, which provides fine graduations of the main wavelength adjustment. With a set so equipped (after the rough tuning has been made in the manner just described), the signal is more accurately tuned by means of the vernier adjustment.

For receivers that have separate controls for the primary and secondary circuits, the tuning process is slightly modified. In this case to tune in correctly a particular signal both primary and secondary circuits must be adjusted to the wavelength of the desired incoming signal.

A rough adjustment of the primary circuit is first made. If the operator has no knowledge whatever of the ap-

proximate adjustment for any particular wavelength, he adjusts the primary circuit to one third or one half its maximum value. If the coupling between the primary and secondary circuits is adjustable, it is placed at maximum during the first step of the tuning process. By maximum is meant that position in which the secondary windings are closest to or parallel with the primary windings.

The wavelength of the secondary circuit is then made in the same manner as first described for the primary adjustment of the single control receiver. When the desired signal is then properly tuned in on the secondary circuit, a re-adjustment of the primary circuit is made until the point at which the signal is heard with maximum loudness is found. In some cases, a slight re-adjustment of the secondary circuit is again advisable with the result that the signal is heard with greatly increased strength.

The advantage of separate controls for primary and secondary tuning and the mutual coupling between those two circuits lies in its selectivity. If adjustments have been completed as described, and an interfering station starts in sending, it is merely necessary to decrease the coupling between primary and secondary circuits and then to re-tune the primary and secondary circuits again. Almost invariably it is possible to find a position of coupling in which the desired station is heard and the interfering station eliminated.

Once the correct adjustment for wavelength has been made, it is a simple matter to adjust the "regeneration," "tickler" or "feedback" control. This is done by slowly turning the control knob from the minimum position toward the maximum. At first this action may not produce any perceptible result; then there will be a sudden and surprising increase in signal strength. But if you increase regeneration too much, the quality of the received signals becomes distorted. At first only the high notes are affected. If the adjustment is turned still further to maximum, the music becomes

completely distorted and its tonal qualities are destroyed.

It is desirable to sacrifice signal strength in order to obtain full advantage of the purity and perfect tonal qualities of radio telephone music. The temptation is to obtain the loudest possible signal at the receiver, but the discriminating operator knows he is not striving to receive the maximum noise but the most enjoyable and most faithful reproduction of the music that is being sent out.

As a measure of economy, minimum filament brilliancy consistent with the reception of the desired signals at audible strength should be employed. When receiving music with the regeneration adjusted to its point, a reduction of filament brilliancy at once causes a cessation of regeneration. But, by increasing the degree of regeneration, the reduction in filament brilliancy can be compensated for up to the point at which regeneration is at a maximum. It is usually unnecessary to burn tubes at white heat and it is very disastrous to their long life. Consequently maximum filament brilliancy should be

avoided if regeneration takes place at lower filament temperatures.

The process of tuning a regenerative receiver may be summarized as follows:

(1) How to Make Preliminary Adjustment:

- Turn the antenna switch to the receiving position.
- Light the filaments by turning on the filament switch or inserting the plug into the jack which completes those circuits.
- Adjust filament brilliancy to the highest point at which no roar or hiss is heard in receivers.

(2) How to Tune:

(In the case of single circuit receivers and single control receivers):

- Adjust the main wavelength switch until the desired signal is heard.
- Adjust the vernier, in the case of two circuit receivers:
 - Make an approximate adjustment of the primary circuit.
 - Carefully tune the secondary circuit until the desired signal is heard, with the coupling at the maximum.
 - Retune the primary circuit.
 - Make the final slight adjustment of the secondary circuit.
 - In case of interference, change the coupling and retune the primary and secondary circuits.

(3) How to Adjust the Regeneration:

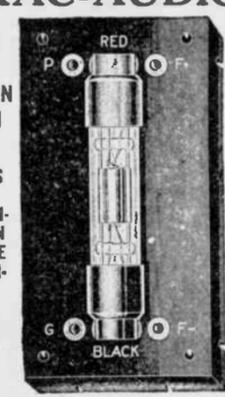
- Gradually increase the degree of regeneration from its minimum position until a sudden increase in amplification is heard; continue very slowly to increase until the note begins to be distorted.
- For purposes of economy, slowly reduce the filament brilliancy and simultaneously increase the regeneration until the regeneration is at a maximum without loss of amplification or distortion.

With these instructions clearly in mind the novice should meet with little trouble with his newly acquired apparatus.

1922 ad

RAC-AUDION

AUDION
\$5.00
5
TIMES
THE
AMPLIFICATION
OF THE
ORDINARY
TUBE



RECEPTACLE
\$1.00
WRITE
FOR
INFORMATION
AND
DIAGRAM
USING
RAC
CHOKE
COILS

4 V-Fil 0.8 Ampere 60-Plate
New Jersey Radio Equip. & Install. Co.
190 BIDWELL AVE. JERSEY CITY, N. J.

1922 ad
Vacuum Tube Detector, \$5.50

Including complete cabinet with all instruments wired ready for use

Detector and Two Stage Amplifier \$22.50

With transformers and all other instruments in cabinet ready for operation. This equipment is of high quality and distances as great as 3000 miles have been obtained with ease.

Batteries and Tubes Extra
2000 Ohm Receivers, \$5.00
Superior Crystal Receiving Set, \$4.75
Attractive dealers' proposition
Steinmetz Wireless Mfg. Co., Inc., 5706 Penn. Ave., Pittsburgh, Pa.

Victor-Victrola

1910



Victor-Victrola X
Mahogany or oak \$75



Victor V
Quartered oak \$60



Victor-Victrola XVI
Circassian Walnut \$250
Mahogany or quartered oak \$200



Victor-Victrola XIV
Mahogany or oak \$150



Victor-Victrola XI
Mahogany or oak \$100

January 15, 1910

August 13, 1910

Victor



The musical instrument for everybody

For those who want the best in grand opera; the best in classical music; in sacred music; in band and orchestra selections; in instrumental solos, duets, trios, and quartets; in old-time ballads; in popular and comic songs; in recitations, minstrelsy and descriptive specialties.

For those who want to pay \$10, \$17.50, \$25, \$32.50, \$40, \$50, \$60, \$100 for a Victor, or \$125, \$200, \$250 for a Victrola.

Whatever kind of music and entertainment you want, and at the price you want to pay.

Hear the new Victor Records at any dealer's, and note how much sweeter and clearer they are than ever before. Ask him to play Caruso's new "Forza del Destino" solo (88207), and "Mamma mia," the beautiful Neapolitan gondolier song (88206). Then you'll fully realize the wonderful progress recently made in the art of Victor recording.

And be sure to hear the Victrola.

Victor Talking Machine Co., Camden, N. J., U. S. A.

Berliner Gramophone Co., Montreal, Canadian Distributors.
To get best results, use only Victor Needles on Victor Records.



Victrola



Tone

That's where the Victrola is pre-eminent.

You might be able to build a cabinet that outwardly would resemble a Victrola. You might even copy the inside construction and details, if they were not protected by patents. But there is no copying the superior Victrola tone-quality.

That represents years of patient experiment—with various woods, with different proportions, with numerous vibratory surfaces—and it is simply astonishing how slight a variation in size, in shape, in position, produces discord instead of harmony.

No, the Victrola tone can't be equaled! Even though the eye could take in every detail of construction, there is still that same indescribable "something" which makes the Stradivarius supreme among violins, which gives to the Victrola such a wonderfully sweet, clear and mellow tone as was never known before.

Hear the Victrola today at the nearest Victor dealer's. Ask him to play the new Caruso-Scotti Duet from Madame Butterfly (89043). Then you'll realize the wonderful advance in quality of tone due to our improved process of making Victor records.

The new Victor catalogue lists more than 3000 selections—both single- and double-faced records. Same quality—only difference is in price. Buy double-faced if the combination suits you.

Victor Talking Machine Co., Camden, N. J., U. S. A.
Berliner Gramophone Co., Montreal, Canadian Distributors.
To get best results, use only Victor Needles on Victor Records.



Victrola XII
Mahogany \$125



Victrola XVI
Circassian walnut \$250
Mahogany or quartered oak, \$200

on the Air

The Horn Speaker wants you to realize that its classified ads as well as the other parts of the newspaper are for the benefits of its readers. The policy of the newspaper is to prevent anyone from benefiting by having early access to its ad space.

Since most items that are placed in the classified section are of limited supply, the staff of The Horn Speaker must see that all readers receive the newspaper at the same time as much as possible.

We the staff of The Horn Speaker, have established a policy of not using its ad space for buying and selling of any used merchandise of single or limited supply, for our own personal collecting. We will use the ad space of one of our fine competitors or a club publication.

off the Record

We have been delighted by the increased enthusiasm from phonograph collectors.

We are looking for someone who would like to contribute regularly a column about record collecting. The columnist would be welcome to use his own address if so desired. We need more space devoted to record collecting.

MART

EASY COST CHART

FOR CLASSIFIED ADS

No. Words	One Issue	Two Issues	Three Issues	Twelve Issues
1-25	1.35	2.45	3.45	12.75
26-30	1.70	2.90	4.15	15.30
31-35	1.95	3.40	4.80	17.80
36-40	2.25	3.90	5.50	20.35
41-45	2.50	4.40	6.15	22.95
46-50	2.75	4.80	6.85	25.45
51-55	3.05	5.30	7.55	28.00
56-60	3.30	5.80	8.25	30.55
61-65	3.95	6.30	8.95	33.05
66-70	3.90	6.75	9.65	35.60
71-75	4.15	7.25	10.30	38.20
76-80	4.45	7.75	11.00	40.75
81-85	4.70	8.20	11.70	43.25
86-90	5.00	8.70	12.35	45.80
91-95	5.25	9.20	13.05	48.40
96-100	5.50	9.65	13.75	50.90
101-110	6.05	10.65	15.15	56.00
111-120	6.60	11.65	16.50	61.00
121-130	7.20	12.55	17.85	66.20
131-140	7.75	13.50	19.25	71.25
141-150	8.25	14.45	20.65	76.30

Photo ads \$2.00 extra.

MISC.

GOT AN OLD RADIO? Want it repaired or restored? Write for free estimate to fix your Crystal set or 1940 Superhet. Bob Lucas, 9014 Mahoning, Houston TX 77036.

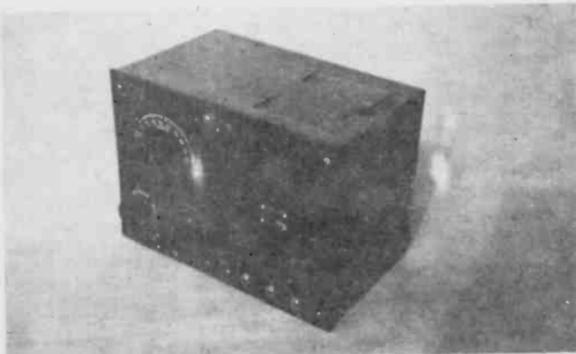
OLD TIME RADIO SHOWS Biggest and Best in The Industry, WE CREATED--VINTAGE RADIO: Catalogue 35¢. MAR-BREN SOUND, 420 Pelham, Rochester, New York, 14610. WE'RE OFTEN IMITATED, BUT NEVER DUPLICATED.

PROFESSIONAL CW operators, retired or active, commercial, Military, Gov't, police, etc., invited to join Society of Wireless Pioneers, W7GAQ/6, Box 530, Santa Rosa, CA 95402.

FOR SALE OR TRADE

WESTERN ELECTRIC Power Supplies from Bell Telephone Microwave system. 0---450 Volts continuously variable pure D. C. Input 115 V. A. C. \$40.00 each plus shipping. Cecil Bounds, Pine Springs Rte., Carlsbad, N. M. 88220.

FEW HUNDRED Old radio tubes. SASE for list. Frank Oglesbee, 900 E. Park No 17, Carbondale IL. 62901.



1920-21 Westinghouse Radio Variometer, Tickler type, Tuner and Detector Amp. in one cabinet. Three 201A tubes included. Plays Perfectly, near Mint. Best Acceptable Offer. Cecil Bounds, Pine Springs Rte., Carlsbad, N. M. 88220.

NEW 1973 MIDCO'S RADIOS/WIRELESS ANTIQUEERS DIRECTORY & COLLECTORS GUIDE, 4th Edition, OVFR 650 Names/Addresses, Phone Numbers, Call Letters, Data of Traders, Buyers, Sellers, Clubs, Museums in U. S. A. & Canada, Associations, Collections, Societies, Old Radio Reprints, Jokes, Collecting Hints for Both the Beginner or Advanced Collector. SERVICES OFFERED: Antique R/W Appraising, Advertising, Restoring, Repairing, Publications, and related subjects. ONLY one Known, EXPERTS in this hobby Keep Directory at Their Finger-tips. ORDER \$5.00 PP., MIDCO HS10, Box 15370, Long Beach CA 90815.

RADIOLA 25 with anter a, no tubes, veneer loose; RCA Radiola 17 Radiola 18; RCA Radiola 60; RCA Radiola 16 \$60.00 each. Dome Cathedral Radios \$50.00 each express extra. Pat Cutini, 969 Genesee St., Buffalo, N. Y. 14211.

WD11 Adaptors, use UX199, 120, VT24. No Wiring changes, Radiola III's Battery hook up included \$5.25 pp., 2 for \$9.25. Keith Parry, 17557 Horace St., Granada Hills CA 91344.

FOR SALE: Power supplies for battery-operated radios, standard and custom. WANTED: Colin B. Kennedy Model 281. G. B. Schneider, 6848 Commonwealth Blvd., Parma Hgts., Ohio 44130.

FOR SALE: Display your Radio's Schematic along with it. The perfect compliment of every set, \$1.00 each. Cecil Bounds, Pine Springs Route, Carlsbad, N. M. 88220.

This Room Is Equipped With
Edison Electric Light.

Do not attempt to light with
match. Simply turn key
on wall by the door.

The use of Electricity for lighting is in no way harmful
to health, nor does it affect the soundness of sleep.

Now you can have an exact 1890 EDISON ELECTRIC LIGHT PLAQUE REPLICA as used when electric lights were first installed anywhere. . . You can MOUNT and DISPLAY this PLAQUE on any SURFACE because of its ADHESIVE BACK. . . just remove paper from back and mount as desired. . . All design and lettering are ENGRAVED and seated in black. . . A special process added to the GOLD-IN-COLOR Aluminum plate makes it impossible to CORRODE or OXIDIZE. . . Unlimited uses and ideas in the Antique field, makes an EYE-CATCHING DISPLAY, HUMOROUS, but serious. . . A fine gift for any occasion. . . ORDER NOW, ONLY \$4.95 Postpaid. . . MIDCO HS10 BOX 15370, LONG BEACH, CA 90815.

ANTIQUATE TELEVISIONS from 1930s & 1940s 3" to 10" screens, over 50 sets, sell one or all or trade? Send \$1.00 for list & Picture. Charles Seidel, 767 Westwood Dr., Santa Barbara CA 93109. Phone: 805 962-3620.

COLLECTOR CLEARING out many Radios, Phonographs and Other Items. Send SASE for list. Richard Cane, 103 Spring St., Passaic, N. J. 07055.

ATWATER-KENT, Model #30, Battery operated, six tube radio receiver, \$75.00 postpaid. Dave Martens, 7 Constitution Blvd., New Castle, Delaware 19720.

USED TUBES, tested 201A \$5.00; 24, 27, 26 etc. \$1.00 each. E. A. Smith, 2706 Cub-hill Rd., Baltimore MD 21234.

WANTED

WANTED: Crystal Radio Receiver Schematics from early 1920's including details of construction, wire sizes, etc., also Tesla coil, Jacob's Ladder, etc. George Seidel, 1201 Powell St., Norristown PA 19401, Pho; 215-275-6333.

WANTED: December 1926 issue Citizen's Radio Callbook, need not be perfect. Edward Crosby, 441 Cedar Ave., East Greenwich, R. I. 02818.

WANT ATWATER KENTS ANY MODEL FROM 7 THROUGH 42: CROSLEYS ANY BATTERY MODEL AND GEMBOX AND SIMILAR ELECTRICS: ATWATER KENT SPEAKERS: ANY TYPE HORN SPEAKERS: WD11, 01A, 201A, ETC. TUBES. DESCRIBE & PRICE. YOUNG, 11 WILLOW COURT, TOTOWA, N. J. 07512.

WILL BUY complete tube and parts stock any quantity. New. Must be priced for quick cash sale. William L. Poston, 3212 Peachtree Ct., Bakersfield CA 93301.

WANTED: Speakers for Grebe CR-12, Radiola 111-A. Any good leads on 1931-32 mechanical "televisors" by Baird, Jenkins. Darcy Brownrigg, Chelsea, Quebec, Canada.

Ghirarde Troubleshooters Handbook 1934 and 1935 issues. Early RCA or other tube Manuals. William L. Poston, 3212 Peachtree Ct., Bakersfield CA 93301.



----- TUBE PRICE LIST NO. 7 ----- Older Type Numbers

Tube prices stated in this list supersede prices stated in Lists No. 1 through No. 6.

Make all checks or money orders payable to J.W.F. PUETT 3008 Abston Drive Mesquite, Texas 75149

ALL TUBES ARE THOROUGHLY TESTED on a mutual conductance tube checker before shipment. CUSTOMER SATISFACTION GUARANTEED -- If you are not satisfied with your order for any reason, tubes may be returned within ten days for refund or replacement with exception of tubes which are shorted or have open filaments. It will be assumed that returned tubes with shorts or open filaments were damaged in shipment. Shipping damage claims will be handled promptly through the post office on insured orders. Puett Electronics assumes no liability for orders which are not insured. Tubes are mailed parcel post - no C.O.D. please. **INCLUDE 10% FOR POSTAGE AND HANDLING.** Insurance rates are 30¢ for orders under \$50.00. **TEXAS RESIDENTS ADD 5% SALES TAX.**

In the following table, the symbol n after a tube type-number indicates that tube is available new. The symbol u indicates that it is available used. Both new and used tubes are shipped in individual cartons. New tubes are usually provided in their manufacturers original cartons; however, new tubes are sometimes purchased in boxes which contain 50 or more tubes. These tubes never had individual cartons. We supply cartons which are not original with these tubes. When ordering new tubes, please let us know if only original manufacturers cartons are acceptable. **PLEASE STATE WHETHER NEW OR USED TUBES ARE DESIRED AND WHETHER A REDUCED-PRICE USED TUBE IS DESIRED WHEN A NEW TUBE IS OUT OF STOCK.** REFUNDS are mailed with your order for out-of-stock tubes, or when, by customer request, a reduced-price used tube is substituted for an out-of-stock new tube. New tubes are priced at \$2.00 each; used tubes are priced at \$1.00 each.

OD3 nu	1LC4 n	3S4 nu	6AV6 nu	6K6 nu	6SV7 n	7B7 u	12A6 n	14C5 n	35/51nu	50L6nu	1203 u
OY4 n	1LC6 nu	3V4 nu	6B4 nu	6K7 u	6S7 u	7B8 u	12AV6nu	14C6 n	35A5 nu	50X6 u	1232 u
OZ4 nu	1LD5 nu	5R4 u	6B5 nu	6K8 u	6T7 nu	7C5 u	12B7 nu	14F7 n	35B5 n	50Y6n	1273 u
1A3 n	1LE3 nu	5T4 n	6B6 nu	6L5 u	6T8 n	7C6 u	12BE6nu	14F8 n	35C5 n	50Y7nu	1299 u
1A4 nu	1LG5 n	5U4 nu	6B7 nu	6L6 nu	6U5 u	7C7 u	12C8 nu	14H7 n	35L6 nu	51nu	1612 u
1A5 nu	1LH4 nu	5V4 nu	6B8 nu	6L7 nu	6U6 u	7E6 nu	12F5 n	14J7 n	35Y4 u	55n	1614 u
1A6 n	1LN5 nu	5W4 nu	6BA6 nu	6N5 n	6U7 u	7E7 nu	12J5 n	14N7 n	35Z3 nu	56nu	1625 u
1A7 nu	1N5 nu	5X4 nu	6BE6 nu	6N6 nu	6U8 nu	7F7 nu	12J7 nu	14Q7 nu	35Z4 u	57 u	1626 u
1B5 nu	1P5 nu	5Y3 nu	6BJ6 nu	6N7 nu	6V6 nu	7F8 nu	12K7 nu	14R7 n	35Z5 nu	58 u	1629 u
1C5 nu	1Q5 nu	5Y4 nu	6C4 n	6P5 nu	6V7 nu	7G7 u	12K8 n	14W7 n	35Z6 nu	59 u	1633 n
1C6 n	1R5 nu	5Z3 nu	6C5 nu	6Q7 nu	6W6 nu	7H7 u	12L6 nu	15 u	36 nu	70A7n	1635 u
1C7 nu	1S4 n	5Z4 nu	6C6 nu	6R7 nu	6X4 nu	7K7 n	12Q7 nu	19 nu	37 u	70L7nu	9002 n
1D5 nu	1S5 nu	6A4 nu	6C7 nu	6S4 n	6X5 nu	7L7 nu	12SA7nu	24A u	38 nu	71 u	9003 n
1D7 nu	1T4 nu	6A5 n	6C8 nu	6S7 n	6Y5 nu	7N7 nu	12SC7nu	25A6 nu	39/44nu	75 u	2-B-14 u
1D8 nu	1T5 nu	6A6 nu	6D6 nu	6S8 n	6Y6 nu	7Q7 u	12SF5n	25A7 nu	40A1 u	76nu	3-H-7 u
1D21 n	1U4 nu	6A7 u	6D7 nu	6SA7 nu	6Y7 u	7R7 n	12SG7 u	25B6 u	40Z5 u	77nu	7-H-11 nu
1E4 n	1U5 nu	6A8 nu	6E5 u	6SE7 nu	6Z4 nu	7S7 nu	12SH7n	25C6 u	41 nu	78 u	33A u
1E5 n	1V u	6AB7 nu	6E6 n	6SC7 nu	6ZY5 nu	7V7 u	12SJ7nu	25L6 nu	42 u	79n	CAA u
1E7 n	2A3 nu	6AC5 nu	6E7 u	6SD7 nu	7A4 nu	7W7 nu	12SK7nu	25S nu	43 u	80nu	XXB n
1F4 n	2A4 nu	6AC7 nu	6F5 nu	6SF5 nu	7A5 n	7X7 nu	12SL7nu	25Z5 nu	44 nu	84nu	XXL nu
1G4 nu	2A5 nu	6AD6 nu	6F6 nu	6SF7 n	7A6 nu	7Y4 nu	12SN7nu	25Z6 nu	45 u	85nu	XXFM nu
1G5 n	2A6 u	6AF6 nu	6F7 u	6SG7 nu	7A7 nu	7Z4 nu	12SQ7nu	26A7 n	45Z3 n	89nu	VR150 nu
1G6 nu	2B7 nu	6AG7 nu	6F8 nu	6SH7 nu	7A8 nu	12A5 n	12SR7nu	27 u	45Z5 nu	100-77u	
1H4 u	3A4 nu	6AK5 nu	6G5 u	6SJ7 nu	7AD7 n	12A7 nu	12V6 nu	28D7 nu	46 n	100-79n	We also
1H5 n	3A5 n	6AK6 n	6G6 nu	6SK7 nu	7AF7 nu	12A8 u	12Z3 nu	30 nu	47 u	117L7nu	have the
1H6 nu	3A8 n	6AL5 nu	6H6 nu	6SL7 nu	7AC7 nu	12AH7nu	14A4 n	31 nu	48 n	117Z3n	following
1J6 n	3E2 u	6AL7 u	6J5 nu	6SN7 nu	7AH7 n	12AL5 u	14A7 nu	32 n	49 n	117Z4 u	types not
1L4 n	3C6 n	6AQ5 nu	6J6 nu	6SQ7 nu	7AK7 u	12AT6n	14AF7n	32L6 u	50A5 nu	117Z6nu	included
1LA4 n	3LF4 n	6AT6 nu	6J7 nu	6SR7 nu	7B4 nu	12AT7nu	14B5 n	32L7 n	50B5 nu	185R8n	aboves
1LA6 u	3Q4 nu	6AT8 nu	6J8 u	6SS7 nu	7B5 nu	12AU6nu	14B6 u	33 nu	50C5 nu	807 u	12SF7 n
1LB4 nu	3Q5 nu	6AU6 nu	6K5 nu	6SU7 nu	7B6 nu	12AU7nu	14B8 u	34 nu	50C6 n	955 n	

TUBE COLLECTOR SPECIALS ----- type 10 - \$5.00, type 12 - \$4.00, type 40 - \$4.00, type 50 - \$5.00, type 205D - \$5.00, type 212 - \$30.00, type 216A - \$8.00, type 401 - \$8.00, type 852 - \$25.00 ----- Write for details.

LIST NO. 7A - more recent tube types - send self addressed stamped envelope.

FOR SALE -- (1) COMPLETE SET OF RIDER MANUALS - diagrams of most old radios - Write for details.

(2) TAPES OF OLD RADIO SHOWS - send self addressed stamped envelope for price list.

WANTED --- (1) Information on and literature produced by McMurdo Silver & E.H. Scott companies.

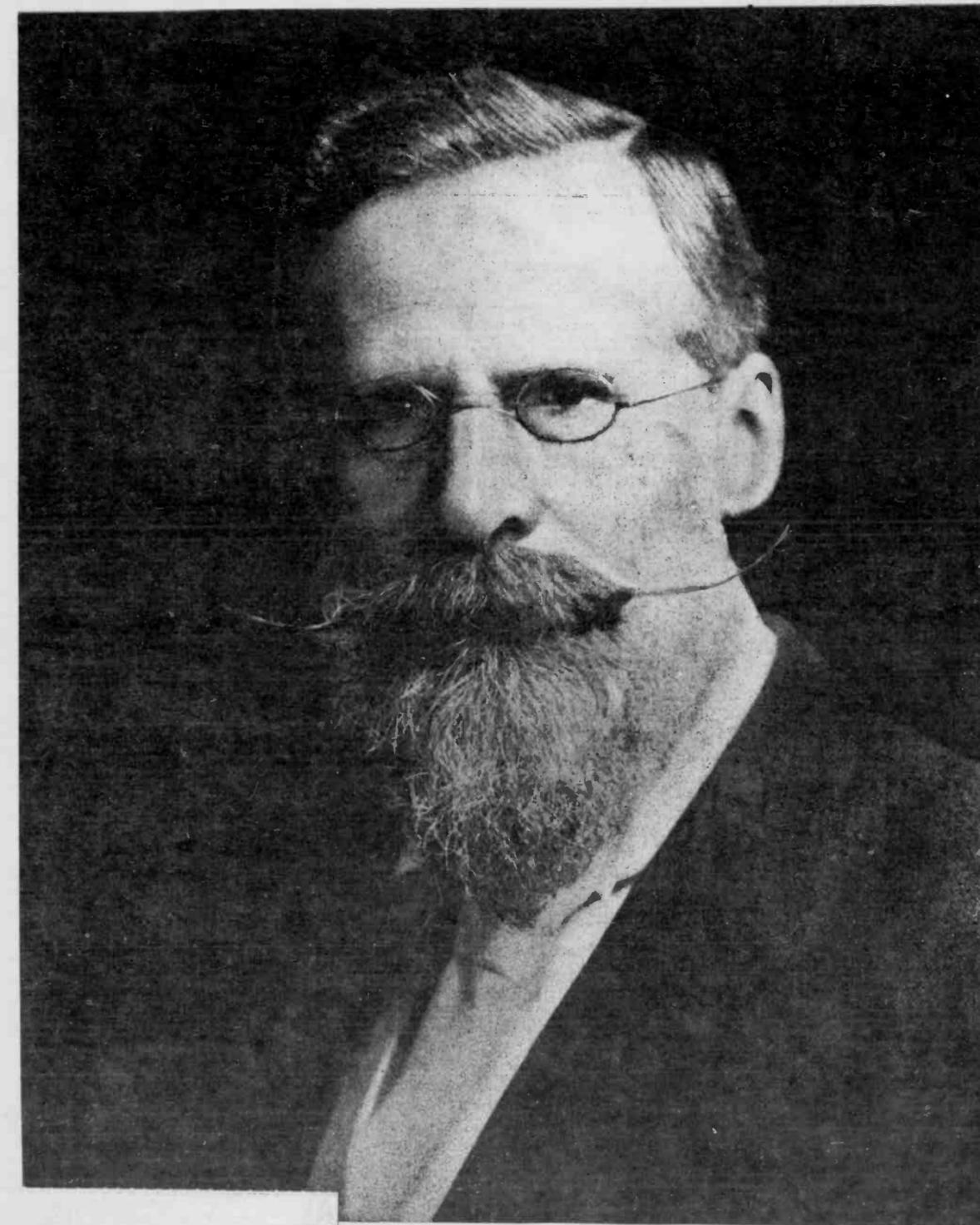
(2) Gold colored horn to fit Magnavox horn-speaker driver base Type M-1 Model A.

THE HORN SPEAKER

December 1973

William Crookes.

Sir William Crookes (1832-1919)—His discoveries led to the development of the ELECTRON THEORY. See Crookes on page 2 for his memorable article on the practical benefits of using radio waves. It was published in the FORTNIGHTLY REVIEW during 1896.



Mr. Gary B. Schneider
6878 Commonwealth Blvd.
Parma Hgts, Ohio 44130