

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

REG. U. S. PAT. OFF.

Vol. IV

Copyright, 1923
R. D. F. Co. Inc.

CHICAGO, ILL., SATURDAY, FEBRUARY 10, 1923

No. 5

HOUSE PASSES AIR BILL

LOOP AERIAL PICKS UP WGY IN LONDON

TRANSMISSION SO CLEAR CHILD IS AWAKENED

Englishman, Using Ordinary Instrument, Hears Schenectady and Newark Plants

LONDON, ENGLAND.—American broadcast stations were heard in London on Christmas Eve by Captain Round, of the Marconi Company, at his home at Muswell Hill, using an ordinary standard Marconi instrument, which in no sense might be termed a freak apparatus—designed specially for the purpose of receiving messages from America. It was a six-tube receiving set with a two-foot loop aerial below the table on which it was placed. In order to compensate for the small aerial Captain Round fitted an extra tube to the set. In conjunction with the receiving instrument a two-step amplifier was used.

Piano Solo Awakens Child
"The wave length on which the messages were received was half way between the wave lengths of the London and Manchester broadcast stations," said Captain Round. "At times the messages would be perfectly clear. In fact one item, a piano solo, was so loud it woke up one of the children. Then the messages would fade away entirely."

"The great obstacle to getting the American stations strongly are the general post office Radio stations, like Northolt and Leafeld, which set up much disturbance and interfere greatly with the messages. But given a place in the north well away from such disturbed areas and the chances are that the signals from America will be heard quite well in favorable circumstances," continued Captain Round. The stations heard were WJZ, at Newark, N. J., and WGY, at Schenectady, N. Y.

One paper worries because people are speculating as to the permanency of Radio. Speculation indicates continued interest in the art, which augurs well for its future.

KOG Returns to Ether After Holiday Layoff

Continues Service Halted for Reconstruction of Studio

LOS ANGELES, CALIF.—After an absence of several weeks during the holiday season, Station KOG, the Evening Herald here, returned to the ether with the advent of the new year by the commencement of its afternoon broadcasting programs of news matter, market reports and other features. The station is not, however, presenting entertainment programs at this time.

The suspension of the station's broadcasting features was caused by the desire to re-construct its Radio studio, located on the seventh-floor of the Chamber of Commerce building, together with other preparations which are being concluded in the form of arrangements to operate KOG as a class B, 400-meter plant.

HARDING TRIES SET; GETS ALL MIXED UP

WASHINGTON.—President Harding stated recently that he tried to work the Radio set which is installed in the library at the White House, the reception yielded noises much like a conference report, it was so jumbled up. The President heard two or three stations at the same time and apparently gave up in disgust trying to be entertained.

Grocer's Set Draws Business

LONDON, O.—A grocery store owner of Alton, fifteen miles east of here, recently installed a sensitive Radio receiving set. He has been able to receive communications from stations in Norway and Sweden, and incidentally, the Radio outfit is proving one of the groceryman's best investments, attracting many new customers.

SO. AFRICA PLANS LARGEST STATION

Government O.K.'s Scheme Offered By English Marconi Firm

CAPETOWN, S. A.—South Africa plans to have the largest Radio station in the world. The government has accepted the scheme put forward by the English Marconi company and it only remains for the sanction of the Union Parliament to be given for work to be begun at once. South Africa will then take its place in the great imperial Radio chain that is being linked around the British Empire.

The engineer in charge of the construction of the station arrived in Cape Town in December. He said that he was satisfied from the reports of the experts who had previously examined many prospective sites throughout South Africa that the possibilities for long-range Radio at the Cape were unlimited. The vicinity of Cape Town as a site had been thoroughly examined and reported upon favorably.

In addition to the consideration of the city's geographical advantages, exhaustive experiments were made with the wave lengths of American and European stations, and the results of these indicated that Cape Town was the best site for reception.

ETHER TRUST AIMED AT BY AMENDMENT

Hoover Pleased at Action

Bill to Go to Senate Next—Quick Action Expected There

(By L. M. Lamm, Special Correspondent)
WASHINGTON.—Passing the House of Representatives January 31 without a record vote, the White-Kellogg Radio bill remained unchanged except for one important amendment said to be aimed directly at the Radio Corporation of America because of its alleged grab for the control of the ether and the monopoly of all apparatus for ether communication. This amendment was made by Representative Jones of Texas, and empowers the Secretary of Commerce to revoke the license of any firm or corporation attempting to monopolize broadcasting or the manufacture of apparatus.

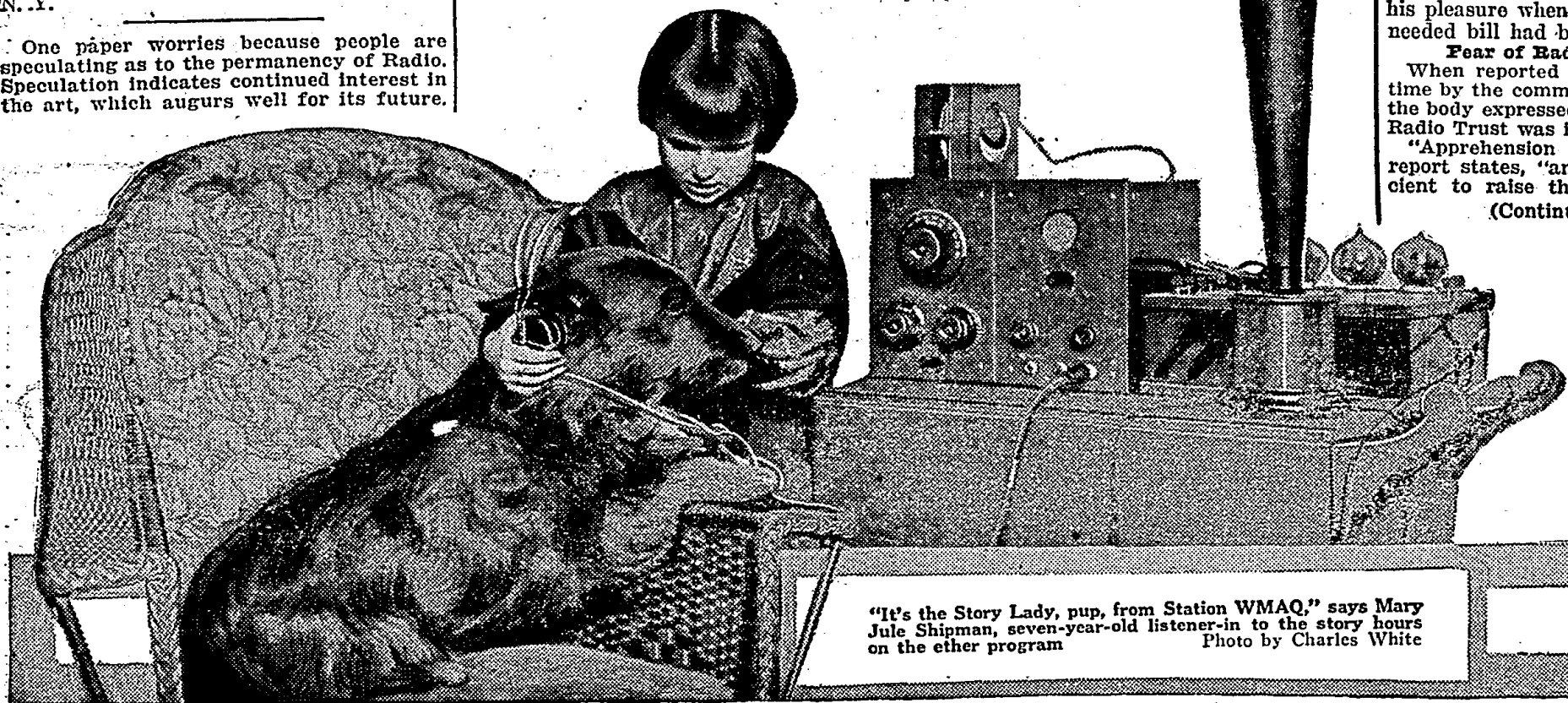
The bill now goes to the Senate where it will be sponsored by Senator Kellogg of Minnesota. It will be referred immediately to the Senate committee on interstate commerce but it is very doubtful if any hearings will be held on the bill by this committee in view of the extended hearings given by the House committee and the fact that there is practically no opposition to the bill.

Secretary of Commerce Hoover expressed his pleasure when informed that the much-needed bill had been passed by the House.

Fear of Radio Trust Expressed
When reported to the House for the first time by the committee on merchant marine, the body expressed the poignant fear that a Radio Trust was in the offing.

"Apprehension has been expressed," the report states, "and there is evidence sufficient to raise the question in reasonable

(Continued on page 2)



"It's the Story Lady, pup, from Station WMAQ," says Mary Jule Shipman, seven-year-old listener-in to the story hours on the ether program
Photo by Charles White

0/0/0

HOUSE PASSES AIR BILL

(Continued from page 1)

minds that certain companies and interests have been endeavoring to establish a monopoly in Radio communication through control of the manufacture and sale of Radio instruments, through contractual arrangements giving exclusive privileges in the transmission and exchange of messages or through other means."

The committee believed that the subject should be carefully investigated and appropriate action considered at an early date. But the committee was unanimously of the opinion that it was impossible during the life of this Congress to inform itself as to the facts involved. The bill is not, however, an antitrust statute. There are included in it several provisions which it is believed will have a restraining influence upon those who otherwise might disregard public right and interest. It is specifically provided that the Secretary of Commerce may refuse a license to any person or corporation which in his judgment is monopolizing Radio communication. He is authorized with respect to licenses for stations transmitting to foreign countries to impose any terms, conditions, or restrictions which may be imposed with respect to cable landing licenses under the act of May 27, 1921. The Secretary is authorized to revoke the license of any person or company which the Interstate Commerce Commission finds has made any unjust and unreasonable regulation or practice with respect to the transmission of messages.

The bill provides that the construction of a station shall not be begun until a permit for its construction has been granted by the Secretary of Commerce.

Besides these protective measures, of course, the amendment made by Senator Jones will aid in the prevention of a patent or communication monopoly, such as might be attempted, perhaps, by the Radio Corporation of America.

Bill Looks to Future

In order to meet the expansion and development of Radio in the years to come, the framers of the bill sought to give the Department of Commerce broad powers of supervision, regulation and control. The bill is limited in its scope; there are many phases of the subject which invite study and in the near future may require further legislation. Only vital proposals, unanimously agreed to by the committee, were embodied in the legislation.

Briefly, the bill requires licenses for all transmitting stations other than governmental stations, and all except governmental operators. It directs the Secretary of Commerce to classify licensed stations and make rules and regulations for the prevention of interference. The President will assign wave lengths to Government stations. But if the Government stations, other than vessels at sea, are transmitting commercial messages, they are subject to the regulations for commercial stations and traffic.

Other features of the bill give the President enlarged authority over all Radio stations in time of war, forbid aliens from owning Radio stations in this country, restrain the transfer of licenses, limit their duration and provide for revocation of licenses. The issuance of licenses rests with the discretion of the Secretary of Commerce.

More Waves for Amateurs

The bill recognizes the privileged status accorded to amateurs by the Radio act of 1912. It strikes from existing law the words "200 meters," and provides that "the wave lengths for amateurs shall not be less than 150 meters or more than 275 meters." This change was desired by the amateurs and has the approval of the conference and of the committee. The amateur is the only user of Radio to whom a definite assignment of wave lengths is made in the law itself. Other wave lengths are allocated by the Secretary of Commerce.

The schedule of fees provided has been worked out to approximate in return the cost of the service to the Government. No objection has been raised by any interest either to the classification or to the amount of the fees prescribed.

Radio Man Loses Life in Naval Plant Flames

BAR HARBOR, ME.—Clinton W. Ward, of Longville, La., Radioman, first class, U. S. Navy, was burned to death January 19 in a fire that destroyed the recreation hall and garage of the navy Radio station at Otter Cliffs, five miles from here. All land wires were down so the news of the tragedy did not reach here until brought over snow-blocked roads. J. R. Dalton, another member of the Radio station staff, was severely burned but will recover. Facilities for fighting the fire were lacking. The entire building and an adjoining garage were destroyed with a loss of \$150,000.

There are two Radio stations at Otter Cliff. One comprises a series of booths for receiving transcontinental messages, but there are no facilities for transmitting messages. Near the receiving station is a Radio compass station, which transmits compass bearings to ships at sea. The power house for the plants is at Seawall, 49 miles away.

WJZ celebrated its first anniversary recently.

\$100 FLEWELLING PRIZE CONTEST RULES

1. Contest is open to all Radiophans, whether or not they are subscribers to Radio Digest, Illustrated. The contest is open now and will close February 24 at midnight. Awards will be announced in the March 17 issue of this publication.

2. The object is to locate and award prizes on a competitive basis for the best Flewelling circuit receiving set entered.

3. Prizes are: First, \$40.00; Second, \$25.00; Third, \$10.00; Fourth to Eighth (five prizes) inclusive, \$5.00 each.

4. In event of a tie, equal prizes will be awarded each tying contestant.

5. Judges will be the Technical Staff of Radio Digest.

6. To enter the contest send working drawings and diagrams together with an article of from 1,500 to 2,500 words in length describing the making and operation of an actual Flewelling circuit receiving set. The article should tell: (a) how to make the set, (b) how to operate it, (c) helpful suggestions for getting maximum results, (d) actual airline broadcasting station receiving range using only one tube, first employing only an indoor aerial but no ground, second, using a ground but no aerial, and third, if available, using only a loop aerial. Other combinations and notations on the antenna system used will be considered in the award of prizes.

7. In sending material for consideration in the contest, exclusive publication rights are automatically given to Radio Digest, Illustrated. All articles published, but not awarded prizes, will be paid for at regular space rates. Unused manuscripts will be returned to contestants on request.

8. In deciding the winners of the contest the judges reserve the right to call for any set entered to be sent in for examination and test Tubes, A and B batteries and phones will not be required in sets sent in for testing.

9. Manuscripts will be judged from the standpoints of neatness, clarity of expression, completeness, and actual tried success of the set described.

10. Originality in the use of various parts of apparatus other than shown by Radio Digest in the Flewelling circuit heretofore, is encouraged and even recommended. See Rule 6, however, for method to be used in determining the range.

Fan Goes 3,576 Miles an Hour in "Radio Travels"

NEEDHAM, MASS.—Robert H. Anthony of this town recently made a record of over 3,576 miles per hour, using a four-tube set. This speed was maintained over a period of six hours and ten minutes. Among the cities visited by Radio were San Francisco and Long Beach, Calif., Roswell, N. M., Colorado Springs, Dallas and Fort Worth, Texas, and Havana,

Cuba, besides such neighborly places as Milwaukee, St. Louis, Atlanta, Birmingham, Ala., and Chicago. There were some 45 broadcasting stations covered in his wanderings, with a grand total mileage of 39,345. This is claimed by Mr. Anthony to be a record for the new game of "Radio Golf."

The latest result of Radiophony is the "Radio impresario." He is the gentleman who arranges for the artists and mechanical details in broadcast concerts.

CONTENTS

Radio Digest, Illustrated, Volume 4, Number 5, published Chicago, Illinois, February 10, 1923. Published weekly by Radio Digest Publishing Company, 123 West Madison Street, Chicago, Illinois. Subscription rates, yearly, Five Dollars; Foreign, Six Dollars; single copies, Ten Cents. Entered as second-class matter April 27, 1922, at the postoffice at Chicago, Illinois, under the Act of March 3, 1879.

"All the Live News of Radio".....	1 to 6
Second Flewelling Prize Contest Rules.....	2
Receiving Records Contest, Complete to Date.....	4
For or Against Phone Clubs? A Discussion in Which Both Sides Are Considered.....	5
Book Reviews.....	6
Radiophonists' Mart, Descriptions of New Apparatus on the Market.....	7
Radiophone Broadcasting Stations, Part III, Including the State, City-Station Index.....	8
The "How" of the Simplified Super Circuit, Part II—Details Regarding the Component Parts, by E. T. Flewelling.....	9
Editorials; Condensed by Dielectric; Indigest, Humor Column.....	10
A-B-C Lessons for Radio Beginners, Chapter VI, by Arthur G. Mohaupt.....	11
Mounting for Spider Web Coils; Five Other Kinks.....	12
Reinartz Panel Set Designed for Compactness, by H. J. Marx.....	13
The Reader's View.....	14
Questions and Answers.....	15
Radio Illustrated, a Page of Pictures.....	16

Looking Ahead

Flewelling Tells "How"—and makes many fans happy with his Super Flivver circuit. Read Part III of this exclusive series of articles next week.

Contest Papers Submitted in the Flewelling Contest are being studied by the Digest Technical Staff. Have you turned in your paper? The first of these will be published in an early issue.

Reinartz Tuners will be discussed by H. J. Marx again next week. He is going to tell about an improved Reinartz circuit in an early number. It's a "knock-out." Watch for it.

A-B-C Lessons for Radio Beginners, Chapter Seven, to appear next week will be a study of crystal detectors. Read the sixth chapter of Arthur G. Mohaupt's series. Turn to page 11.

Station WMAQ and the Ideals Behind It will be described by Vera Brady Shipman next issue in an interesting illustrated article on the well known Chicago Daily News—Fair Department Store plant.

The Only Sure-Fire Radiophonist's Telephone Book, Part I, will appear again next week.

Looking Still Further Ahead, Benjamin F. Miessner and Thomas W. Benson, to say nothing of Letson Balliet, will soon have some new "dope" for the Digest readers to digest.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher, Radio Digest, Illustrated, 123 West Madison St., Chicago, Illinois. 4-5

Please find enclosed check M. O. for Five Dollars (Six, Foreign) for One Year's Subscription to Radio Digest, Illustrated.

Name

Address

City State

NAVY CHIEFS LAUD RADIO IN WAR USE

GIVES NATION POWER TO STRIKE HARD

All Prime Stations of Sea Force to Be Retained as Minor Plants Are Quitted

By Carl H. Butman

WASHINGTON.—The value of Radio in the U. S. Navy, both in peace and war, is testified to by four rear admirals and three captains in a report seeking, by the elimination of unimportant shore stations to increase the value of the navy afloat. These naval experts declare an efficient Radio service gives a nation that most important of all war assets—the power to strike hard with its fighting forces.

The abandonment or transfer of 27 minor naval Radio and compass stations was recommended recently by the special naval board on Shore Stations headed by Rear Admiral Hugh Rodman, and was forwarded to Congress by Secretary Denby with his approval. Disposal of these useless Radio shore stations will make for naval sea efficiency.

"Every dollar saved through the elimination of the stations, whether in pay of operators or for maintenance, will be used to improve fleet communication and make for efficiency and mobility of the sea forces of the nation," said a naval Radio officer, explaining the board's recommendations.

New Commercial Stations Anticipated

Communication experts of the navy believe that when these naval Radio stations are closed, commercial interests now served by these stations will immediately establish new public stations equipped with modern apparatus, which will guarantee better service to the public and not interfere with broadcasting. Already the old Miami Station is leased to a commercial company which plans complete new equipment.

Most of the old stations were unnecessary from a marine point of view, and the navy could not afford to continue their operation. Many of the Radio transmitting stations, recommended for the scrap heap, were equipped with old spark sets which interfered with telephonic broadcasting. Some of them had been maintained at a cost ten times the return since the war, because no local public Radio service facilities were available.

Navy to Give Up No Prime Stations

All the high power naval Radio stations such as Arlington, Annapolis, Porto Rico, Canal Zone, Honolulu, Guam, and certain stations in Alaska, as well as the semi-high power stations in the navy yards at the twelve important naval bases, will be retained, together with a number of minor stations now in use. Today there are 65 traffic stations and 33 compass stations in operation, requiring a personnel of 70 officers and 1,257 men. The elimination of 27 would leave 71 active stations. This will be sufficient to meet the navy's needs ashore.

The Board recommended that eight Radio stations on the Great Lakes and those at Buffalo and Cleveland, be abandoned or turned over to the army for operation. Nine located at Baltimore, Md., Mobile, Ala., Miami and St. Petersburg, Fla., Grand Isle, La.; Port Arthur, Texas; Seattle, Washington; Navassa Is., West Indies, and Managua, Nicaragua, will probably be discontinued and abandoned.

Radio compass stations at Detour Pass, White Fish Point, and Grand Morais, Michigan, were recommended for transfer to another government department or abandoned. The sites of two old and unused Radio stations at Siasconsett and South Wellfleet, Mass., were also recommended for disposal. It is said some of them might be operated by the navy if commercial and shipping interests would meet the cost of maintenance.

WNAC Rigs Loud Speaker on Street Before Station

BOSTON, MASS.—A special loud speaker has been rigged up on the Tremont street front of the Shepard Stores, connected with the broadcasting room on the eighth floor of Station WNAC, and every night a concert is given to passersby on Tremont street and to interested groups who stop to listen on the famous Common directly opposite. Hundreds of people, hearing the mysterious music issuing from some point high above their heads, crane their necks and locating it finally in surprise, stop to listen.

Open New Manchester Plant

MANCHESTER, N. H.—A new broadcasting station of 100-watts, owned by Barton's Department store here, and operating on 360 meters, was formally opened by Governor Brown of New Hampshire during the week of January 22. The station has a range of 1,800 miles and will be the only one east of Boston giving regular programs. It will broadcast afternoon concerts and high class programs four evenings a week.

RADIO OPERA WINS NEW ENGLAND FANS

MANY LISTENERS IN GET FIRST TASTE

Letters to WNAC Praise Chicago Opera Company's Broadcasts from Boston

BOSTON, MASS.—New England was given a taste of opera by Radio on January 22 when WNAC, the Shepard Stores station, broadcast "Aida," sung by the Chicago Opera Company at the Boston Opera House. The event was a huge success. Many thousands of fans, especially the younger element, received their first impressions of grand opera in this manner.

At a time when orchestra seats at the opera house were all sold out at six dollars each, many thousands of people were able to share its benefits than could be accommodated in the largest auditorium in the East.

Broadcast Aids Opera Popularity

As for the benefit to the opera management? Well, at one Radio opera party of twenty people, a half dozen or more were heard to remark that they must go to some other performance during the week. The excellent renditions of the artists had inspired them to action. There were six new converts to grand opera. How many hundreds more is merely a problem in mathematics.

In another case a youngster listening in at another station said he never knew before that opera was so entertaining, and if the applause could be taken as an indication of appreciation, everyone must have been well pleased. He bought a ticket for another opera.

Fan Thanks Radio Opera Fixers

A most appreciative letter was sent in by A. W. Straus, who has a sensitive set and a powerful loud speaker, so that he was able to give Radio parties on the nights when Station WNAC had especially elaborate programs. Mr. Straus expressed in warm terms his appreciation of the broadcasting of various high-class artists, and particularly the performance by the Chicago Opera Company, saying that the public owes much in heartfelt gratitude to this company and others interested for their public spirit in arranging the Radio performance.

NATION'S COPS HEAR GOTHAM POLICE CHIEF

Crack Law Enforcer Talks by Radio on Police Work

NEWARK, N. J.—Commissioner Richard E. Enright, head of the Greater New York police department and president of the International Police Conference, broadcast a talk, "Police Work," for the special benefit of the police chiefs of the United States, at Station WOR, the L. Bamberger and Company here, on the evening of January 26.

Every important police station in North America is now equipped with a first-class receiving outfit, and as Commissioner Enright is recognized as the world's leading authority on the very latest methods of law enforcement, it is believed that fifty thousand police officers between the Pacific and Atlantic Coasts were among the invisible audience.

Issue 10 Class A Licenses One Class B in Two Weeks

CHICAGO.—One new Class B broadcaster and 10 Class A stations were licensed during the two weeks ending January 27. The Commercial Publishing Co. (Commercial Appeal), Memphis, Tenn., was licensed as a Class B station on 400 meters, with 500 watts power. The following Class A stations were licensed on 360 meters:

KFCP—Ralph W. Flygare, Ogden, Utah; WPAY—Bangor Radio Laboratory, Bangor, Me.; WQAJ—Ann Arbor Times-News,

PLANTS SLASH JAZZ AT REQUEST OF FANS

COLUMBUS, O.—Following requests from fans, Stations WCAH, of the Entekin Electric company, and WPAL of the Superior Radio and Telephone Equipment company, Columbus, have agreed to set aside a number of evenings for the broadcasting of programs entirely void of jazz music. The announcement states that vocal and musical numbers of the better class will be sent on these nights.

"WES" SPINS A BED TIME YARN FOR PALS

BOSTON MASS.—Wesley "Freckles" Barry, the youthful comedian of the screen, who has been appearing in a vaudeville skit at the Shubert Theater, got in touch with young Radiophans the other night, when he broadcast from the Shepard Stores station, WNAC, one of his famous bedtime stories. The subject was original with him and was greatly enjoyed by hundred of fans.

SHE SUGGESTS STOCK COMPANY



Margaret Lawrence, now being starred by Sam H. Harris in "Secrets" at the Fulton Theater, New York City, recently broadcast a talk suggesting the formation of a Radio Stock Company. The idea was so popular with the Radiophans that Miss Lawrence is still receiving letters from them. Miss Lawrence was very effective as a broadcaster, according to the listeners-in

Ann Arbor, Mich.; WQAM—Electrical Equipment Co., Miami, Fla.; WRAC—State Normal School, Mayville, N. D.; WRAD—Taylor Radio Shop, Marion, Kan.; KFGB—Loewenthal Bros., Pueblo, Col.; WQAF—Sandusky Register, Sandusky, O.; WRAM—Lombard College, Galesburg, Ill.; WQAD—Whitall Electric Co., Waterbury, Conn.; WSAB—Southeast Missouri State College, Cape Girardeau, Mo.; WQAH—Brock-Anderson Elect. Eng. Co., Lexington, Ky.

To Open Up Orient BEIRUT, PALESTINE.—To open up the orient, Radio has been called in and will undoubtedly play an important part in modernization of the near eastern countries. A new Radio station has been erected here which is the connecting link between Syria and Lebanon, and has been recently placed in operation by the French, who are in charge. A series of stations has been contemplated.

GLUCK PICKS WPAL FOR FIRST CONCERT

SINGS INTO MICROPHONE FOR HALF HOUR

Soprano, Known from Coast to Coast, Gives Initial Radio Program at Columbus

COLUMBUS, O.—A Columbus Radio station, WPAL, of the Superior Radio and Telephone Equipment company, was chosen by Alma Gluck, whose soprano voice is known from coast to coast and across the waters, for her first Radio performance. Saturday afternoon, January 27, Miss Gluck sang into the microphone of Station WPAL for slightly over half an hour.

Miss Gluck, who was visiting at the home of Dr. and Mrs. S. D. Edelman, Columbus, is the wife of Efreim Zimbalist, world-famous violinist, who is now on a concert tour. Their children are at home in New York and it was to enable them to hear their mother's voice over a Radio receiving set that Miss Gluck accepted the invitation to sing from the Columbus station. A telegram was sent to the governess of the children to tune in for the concert from the Columbus station. The two children are six and four years of age.

Recognize Singer in Music Stores

The famous singer during her two-day stay in Columbus was taken on a tour of the Columbus music stores by Mrs. Edelman, who is her niece. She was readily recognized in several of the shops, in one instance by a 90-year-old woman admirer. Miss Gluck has been off the concert stage for some time and frankly admitted that the main purpose in this is to become better acquainted with her two children. She is learning the Russian language in the meantime by writing three letters a week in that tongue to her husband. She returned to New York late Saturday night.

WANTED—INSPECTORS; U. S. EXAM, MARCH 7

Both Men and Women Eligible; \$1,800-\$2,200 Per Year

WASHINGTON.—The Government is holding an examination on March 7 for Radio inspectors. Salaries run from \$1,800 to \$2,200 per annum, and the examinations can be taken in practically any large city by applying to the civil service commission. Both men and women are eligible; over 21 years of age and under 50. The appointing officer reserves the right to specify whether he desires a man or woman.

Applicants must have a scientific degree from a school of recognized standing or the equivalent of a high school education and two years of Radio work, and all must be Radio operators.

The examination includes theoretical and practical questions in the construction, use and adjustment of Radio apparatus and auxiliaries, counting 50 per cent. Education and experience in the line of duties constitutes the other 50 per cent of the test.

The Department seeks to provide a list of available inspectors to take the places of inspectors who have resigned, but it is believed that the new Radio legislation will require the services of a number of additional inspectors.

Inside Dope on Press Agents

NEWARK, N. J.—Wells Hawks, the far-famed publicity promoter for the Sam H. Harris Enterprises, broadcast from Bamberger Station, WOR, here recently an interesting talk on "Men Who Juggle the Alphabet," (meaning press agents). He gave inside information pertaining to the semi-mystic art of press agency and told about some of his most thrilling and laughable personal experiences.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Amplification—Not Prevarication



RECEIVING RECORD CONTEST

By the Contest Editor

HOW many of the 202 records published in the January 6 issue do you think were able to hold their own? Well, a count shows 140 still in existence with this revision of the complete list of record holders. Sixty-two records were broken and 63 new records were made. The total list of records now numbers 265.

Going on with the statistics, only 61 records are for distances of 2,000 miles and over; a mere 11 for distances of 2,500 miles and over; and only one for a distance of over 3,000 miles.

The contest editor would be glad to receive complete descriptions of sets used by the holders of records of 2,300 miles and over. Then he can tell other fans the tricks used to make real records. Have you had a record of that class published? Send in the facts about your set if you can qualify.

Station—Miles Away—Who Heard It

- CFAC—1650, R. A. Deger, Dayton, O.
- CFCB—1850, C. C. Beery, Spokane, Wash.
- CFCB—2200, A. J. Barron, Johnson City, Tenn.
- CFCB—2325, B. H. Seydel, Tacoma, Wash.
- CFCN—1775, John W. Hale, Houston, Tex.
- CHBO—2450, S. S. Florence, Phillips, Mo.
- CHCA—1625, T. S. Wildman, Nicholas, Iowa.
- CHCC—1325, Samuel Woodson, Jr., Liberty, Mo.
- CHCC—1300, W. Easley, Enid, Okla.
- CJCA—1650, Kenneth Meyer, Greensburg, Ind.
- CJCB—1300, V. Dennis, Oskaloosa, Kans.
- CJCE—2100, F. C. Woodford, Canton, O.
- CJCC—1375, D. J. Morris, Weir, Tex.
- CKAC—2700, A. C. Carter, Juneau, Alaska.
- CKCR—1625, L. Genack, Springfield, Mass.
- CKCR—1225, Samuel Woodson, Jr., Liberty, Mo.
- DKS—1225, C. D. Mason, Cleveland, O.
- DNV—2100, W. E. Davison, Berwick, N. S., Can.
- KDA—2450, C. Edge, Jr., Melbourne, Fla.
- KDKA—2150, Geo. Walker, Fresno, Cal.
- KDN—2175, F. C. Woodford, E. J. Poyser, Canton, O.
- KDPT—1800, C. Hackney, Fairmont, Ind.
- KDVI—2075, T. F. Powers, Somerville, Mass.
- KDYM—1100, H. L. Hartman, Holsington, Kans.
- KDYQ—2550, C. M. Rice, Jr., Worcester, Mass.
- KDYR—2000, H. H. Osage, N. Y.
- KDYX—1925, M. C. Ridenour, Kingwood, W. Va.
- KDYW—1025, C. B. Martin, Springfield, S. D.
- KDYX—4150, W. E. Long, Sterling, Ill.
- KDYY—1100, P. Wetsgerber, Jackson, Mich.
- KDZK—1850, C. H. Nolder, Cincinnati, O.
- KDZK—1300, Harold Canon, Storm Lake, Iowa.
- KDZQ—1325, H. S. Rahiser, Pittsburgh, Pa.
- KFDA—1600, D. L. Kaiter, Dayton, Ohio.
- KFAF—1775, F. W. Foss, Boston, Mass.
- KFAN—1775, C. W. Hennessey, Boston, Mass.
- KFAN—1925, Chas. N. Schwab, Grinnell, Iowa.
- KFAP—1950, A. M. Tobias, East Orange, N. J.
- KFAS—1900, F. Brumon, Urbana, O.
- KFAY—1550, C. N. Schwab, Grinnell, Ia.
- KFBB—1050, H. Henry, Butler, Mo.
- KFCB—2125, J. D. Crosby, Stauffer, Pa.
- KFBD—1375, W. M. K. Young, Kansas City, Mo.
- KFBH—1450, R. B. Reed, Eureka, Kans.
- KFBK—1950, H. S. Juday, Eldorado, O.
- KFBM—2450, T. W. Ziegler, Charleston, S. C.
- KFCG—1025, B. H. Seydel, Tacoma, Wash.
- KFCG—1525, R. P. Wallace, Cedar Rapids, Ia.
- KFCB—1150, F. R. Parsons, Indianapolis, Ia.
- KFCF—1775, R. A. Deger, Dayton, Ohio.
- KFDA—2250, L. Genack, Springfield, Mass.
- KFDD—2400, W. H. Rhodes and Chas. Rhodes, Middleton, Pa.
- KPFB—1150, H. R. Wunder, Chevrolet, O.
- KPFB—1125, R. L. Hartman, Holsington, Kans.
- KFY—2150, M. C. Ridenour, Kingswood, W. Va.
- KFY—1200, C. Sawyer, Liberal, Kan.
- KFZ—1750, E. Stonton, Vicksburg, Miss.
- KGF—1350, S. M. Woodson, Jr., Liberty, Mo.
- KGG—1550, T. S. Wildman, Nicholas, Iowa.
- KGN—1875, Fay Allardling, Lake Odessa, Mich.
- KGU—4650, Eugene Evans, Tippecanoe City, Ohio.
- KGW—2475, Dr. L. D. Bassett, Sidney, N. Y.
- KGY—1500, E. Coston, Edmond, Okla.
- KHJ—2500, W. E. Davison, Berwick, N. S., Can.
- KHQ—2500, C. M. Rice, Jr., Worcester, Mass.
- KIJ—1575, Chas. N. Schwab, Grinnell, Iowa.
- KIR—1500, W. M. K. Young, Kansas City, Mo.
- KLP—2180, W. G. Mann, London, Ont., Can.
- KLX—2225, C. J. Lohman, McDonald, Pa.
- KLZ—2100, W. E. Davison, Berwick, N. S., Can.
- KMO—1200, A. Taylor, Winnipeg, Man., Can.
- KNI—2075, R. A. Deger, Dayton, O.
- KNJ—1350, N. M. Holmes, Chippewa Lake, O.
- KNT—2425, J. H. Wall, Rensselaer, N. Y.
- KOB—1975, C. M. Rice, Jr., Worcester, Mass.
- KOG—2125, A. H. Jessup, Erie, Pa.
- KON—1900, F. Brinnon, Urbana, O.
- KOP—2075, T. W. Smith, Watonsville, Calif.
- KPO—2275, G. Murray, Toronto, Can.
- KQP—2100, G. A. Walter, McDonald, Pa.
- KQW—1900, C. Conrad, Logansport, Ind.
- KSD—1725, Wm. Schauer, Daly City, Calif.
- KUO—2675, C. M. Rice, Jr., Worcester, Mass.
- KUY—2100, Roland Smith, Hilo, Hawaii.
- KVQ—1125, G. D. Roberts, Edmonton, Alta., Can.
- KWG—2500, Mrs. A. S. Mawhinney, New York, N. Y.
- KWH—2250, Hugh Meetze, Manassas, Va.
- KWJ—2125, C. J. Lohman, McDonald, Pa.
- KYF—1100, R. L. Hartman, Holsington, Kans.
- KYG—2175, J. F. Means, Oil City, Pa.
- KYJ—2025, V. Y. Tompkins, Cleveland, Ohio.
- KYW—1850, J. J. Beales, Jr., San Anselmo, Cal.

- KYY—2250, W. Alan, Butler, Pa.
- KZDQ—1250, F. C. Woodford, Canton, O.
- KZM—2700, Sarkis Kachajian, Worcester, Mass.
- KZN—1650, E. K. Klits, Bluefield, W. Va.
- KZY—1950, A. Galloway, Jr., Grand Rapids, Mich.
- NOF—1100, C. B. Martin, Springfield, S. D.
- PWX—2675, M. A. Jeffords, Wenatchee, Wash.
- WAA—1150, H. K. Cooper, Owego, N. Y.
- WAA—1775, W. F. Macleod, Prince Albert, Sask., Can.
- WAA—1900, C. C. Beery, Spokane, Wash.
- WAA—1900, R. P. McDonald, Houston, Tex.
- WAA—1550, Richard R. Martindale, Los Angeles, Calif.
- WAA—1450, C. Sawyer, Liberal, Kans.
- WAA—1400, H. Baird, River de Chuto, N. B., Can.
- WAA—1325, W. R. Clark, Bridgeport, Conn.
- WAA—1325, W. Douglass, Guthrie, Okla.
- WAA—1700, W. E. Davison, Berwick, N. S., Can.
- WAA—1125, F. P. Cerniglia, Tallulah, La.
- WAA—1275, A. G. Hilton, Bicknell, Calif.
- WAA—1600, G. P. Klein, Leduc, Alta.
- WAA—1450, C. C. Beery, Spokane, Wash.
- WAA—1575, C. C. Beery, Spokane, Wash.
- WAA—1125, N. Theobald, Attleboro, Mass.
- WAA—1250, M. Neuman, Guthrie, Okla.
- WAA—1125, M. L. Johnson, Atchison, Kans.
- WAA—1050, F. T. Wycoff, Springfield, Mass.
- WAA—1125, Dr. W. C. Wolverton, Linton, N. D.
- WAA—2550, C. Blanch, Amherst, N. S., Can.
- WAA—1000, Carl Baumelster, Avoca, Iowa.
- WAA—2175, C. D. Roberts, Edmonton, Alta., Can.
- WAA—1825, W. E. Davison, Berwick, N. S., Can.
- WAA—1100, W. E. Davison, Berwick, N. S., Can.
- WAA—1400, C. Pearce, Hallis, Kan.
- WAA—1100, Mrs. Nancy L. Wolverton, Linton, N. D.
- WAA—1325, K. McNeill, Ottawa, Ont., Can.
- WAA—1075, D. J. Morris, Weir, Tex.
- WAA—1025, F. J. McKenny, New Prague, Minn.
- WAA—1150, G. D. Roberts, Edmonton, Alta., Can.
- WAA—1750, Sarkis Kachajian, Worcester, Mass.
- WAA—1000, G. D. Roberts, Edmonton, Alta., Can.
- WAA—1325, Doyle Götter, Arkansas City, Kan.
- WAA—1050, D. J. Morris, Weir, Tex.
- WAA—1150, M. L. Johnson, Atchison, Kan.
- WAA—1025, D. H. Harris, Marlboro, Mass.
- WAA—1650, C. M. Rice, Jr., Worcester, Mass.
- WAA—1200, W. M. K. Young, Kansas City, Mo.
- WAA—2050, A. G. Hilton, Bicknell, Calif.
- WAA—1225, J. Shamburg, Tekamah, Nebr.
- WAA—1675, W. E. Davison, Berwick, N. S., Can.
- WAA—1300, C. Hackney, Fairmont, Ind.
- WAA—2175, G. L. Harns, Portland, Ore.
- WAA—1200, R. Hastings, Atchison, Kan.
- WAA—1125, M. M. Cardwell, Republic, Kan.
- WAA—1375, W. H. Spencer, Montreal, Que., Can.
- WAA—1500, M. J. Columbe, Plattsburg, N. Y.
- WAA—1875, M. J. Bevilockway, Lomita Park, Calif.
- WAA—1175, C. B. Martin, Springfield, S. D.
- WAA—1200, Carl Baumelster, Avoca, Ia.
- WAA—1250, A. L. Lewis, Stanberg, Mo.
- WAA—1275, J. H. Wall, Rensselaer, N. Y.
- WAA—1125, R. Hastings, Atchison, Kan.
- WAA—2225, Nestor Barrett, Republic, Wash.
- WAA—2450, N. E. Parr, Albany, Ore.
- WAA—1375, E. A. Howard, Watch Hill, R. I.
- WAA—1100, J. H. Wall, Rensselaer, N. Y.
- WAA—2100, Dobson & Tucke, Oakland, Cal.
- WAA—1250, M. J. Columbe, Pittsburgh, N. Y.
- WAA—1175, R. Luther, Jefferson, Ia.
- WAA—1200, H. S. Rahiser, Pittsburgh, Pa.
- WAA—1950, H. Gow, Seattle, Wash.
- WAA—1925, W. E. Davison, Berwick, N. S., Can.
- WAA—1075, Harold Canon, Storm Lake, Iowa.
- WAA—1375, R. L. Hartman, Holsington, Kans.
- WAA—1875, B. H. Seydel, Tacoma, Wash.
- WAA—1275, P. Benneyan, Fresno, Calif.
- WAA—1175, E. E. Case, Beverly, N. J.
- WAA—1250, J. H. Wall, Rensselaer, N. Y.
- WAA—1250, W. Douglass, Guthrie, Okla.
- WAA—1000, D. J. Morris, Weir, Tex.
- WAA—2475, Geo. L. Ritz, Rockwell City, Iowa.
- WAA—1625, H. Lardner, Halifax, N. S., Can.
- WAA—1250, W. E. Davison, Berwick, N. S., Can.
- WAA—1000, D. J. Morris, Weir, Tex.
- WAA—1025, E. McDonald, Valleyfield, Que., Can.
- WAA—1750, E. L. Dye, Plainville, Tex.
- WAA—2375, R. R. Martindale, Philadelphia, Pa.
- WAA—2175, Allan Harvey, Snohomish, Wash.
- WAA—2175, N. E. Parr, Albany, Ore.

Patents Procured and Trade-Marks Registered. Advice and terms upon request.

ROBB, ROBB & HILL,
1417 Hanna Bldg., 956 McLachlan Bldg.,
Cleveland, O. Washington, D. C.

FACTORY TO YOU

Finest 23 Plate Variable Condensers \$1.25
\$8.00 2200 Ohm Head \$3.25
Phones, per pair \$3.25

B-W RADIO CO.

539 So. Franklin St., Chicago, Ill.

- WGY—2575, J. J. Beales, Jr., San Anselmo, Cal.
- WHA—1250, W. E. Davison, Berwick, N. S., Can.
- WHAB—1550, G. W. Perkins, Thomson, N. Y.
- WHAP—1050, H. Rawls, Phoenix, Ariz.
- WHAY—1600, Dick Lawrence, Sacramento, Calif.
- WHAN—1250, K. McNeill, Ottawa, Ont., Can.
- WHAS—1425, W. F. Macleod, Prince Albert, Sask., Can.
- WHAZ—2200, Percy Sorcerance, Pullman, Wash.
- WHB—1675, W. E. Davison, Berwick, N. S., Can.
- WHK—1550, L. W. Gushwa, Firth, Ida.
- WHX—1025, Mrs. A. S. Mawhinney, New York, N. Y.
- WIA—1200, H. Meetze, Manassas, Va.
- WIA—1050, D. J. Morris, Weir, Tex.
- WIA—1200, F. T. Wycoff, Springfield, Mass.
- WIA—1000, R. V. Hammer, Creston, Ia.
- WIAE—1625, G. F. Cory, New Bedford, Mass.
- WIAE—1700, A. Moffet, Ottawa, Can.
- WIAJ—1000, D. J. Morris, Weir, Tex.
- WIAP—1200, D. J. Morris, Weir, Tex.
- WIAX—200, Allan Harvey, Snohomish, Wash.
- WJZ—1200, C. B. Martin, Springfield, S. D.
- WJX—1400, H. Simons, Ft. Worth, Tex.
- WJZ—2575, J. J. Beales, Jr., San Anselmo, Cal.
- WKA—1025, Wilbur Squier, Detroit, Mich.
- WKA—1175, Mrs. Nancy L. Wolverton, Linton, N. D.
- WKA—1000, G. D. Roberts, Edmonton, Alta., Can.
- WKA—2400, R. V. Hammer, Creston, Ia.
- WKC—1200, J. E. Latt, Fairfield, Tex.
- WKY—1325, T. W. Smith, Watonsville, Calif.
- WLAB—1100, C. H. Vale, Providence, R. I.
- WLAC—1175, D. J. Morris, Weir, Tex.
- WLAD—1275, M. J. Columbe, Plattsburg, N. Y.
- WLAE—1525, D. O. Wolfe, San Jose, Calif.
- WLAF—1600, D. J. Morris, Weir, Tex.
- WLAF—1450, J. H. Wall, Rensselaer, N. Y.
- WLAL—1025, Hugh Meetze, Manassas, Va.
- WLAP—1925, A. G. Hilton, Bicknell, Calif.
- WLAV—2000, G. A. Gallagher, Berkeley, Calif.
- WLK—1950, Wm. Schauer, Daly City, Calif.
- WLW—1875, Richard R. Martindale, Los Angeles, Calif.
- WLAB—1250, W. F. Macleod, Prince Albert, Sask., Can.
- WMA—1075, C. Edge, Jr., Melbourne, Fla.
- WMA—1150, H. J. Latschaw, Clearfield, Pa.
- WMA—1250, R. Henry, Butler, Mo.
- WMA—1600, Perkins Benneyan, Fresno, Calif.
- WMC—1000, A. Taylor, Winnipeg, Man., Can.
- WNA—1275, C. M. Bennett, Aurora, S. D.
- WNA—1500, C. T. Mower, Malden, Mass.
- WNA—1375, J. H. Wall, Rensselaer, N. Y.
- WNA—1200, J. H. Wall, Rensselaer, N. Y.
- WNA—1000, R. V. Hammer, Creston, Ia.
- WNA—2375, B. H. Seydel, Tacoma, Wash.
- WNA—1525, G. F. Cory, New Bedford, Mass.
- WNA—1300, O. F. Klein, Leduc, Alta.
- WOAS—1125, Samuel Woodson, Jr., Liberty, Mo.

- WOAZ—1050, O. E. Frazier, Watts, Calif.
- WOC—1675, H. S. Trost, San Jose, Calif.
- WOH—1150, W. E. Davison, Berwick, N. S., Can.
- WOI—1525, R. H. Strong, Bicknell, Calif.
- WOK—1150, H. Rawls, Phoenix, Ariz.
- WOO—1325, J. E. Lott, Fairfield, Tex.
- WOQ—1150, G. W. Perkins, Thomson, N. Y.
- WOR—2100, H. H. McMullen, Prescott, Ariz.
- WOS—1200, W. F. Macleod, Prince Albert, Sask., Can.
- WOZ—1850, Fred Sheppard, Centralia, Wash.
- WPA—1140, C. Edge, Jr., Melbourne, Fla.
- WPAB—1250, J. Skinner, Corsicana, Tex.
- WPAC—1075, Hugh Meetze, Manassas, Va.
- WPAQ—1025, R. A. Deger, Dayton, Ohio.
- WRL—1100, W. M. K. Young, Kansas City, Mo.
- WRP—1300, A. Taylor, Winnipeg, Can.
- WRB—1225, O. E. Frazier, Watts, Calif.
- WRW—1225, K. E. Gabbert, Clay Center, Kan.
- WSAS—1225, F. T. Wycoff, Springfield, Mass.
- WSAV—1125, Billy Withington, Jackson, Mich.
- WSB—2275, L. K. Poyntz, Victoria, B. C., Can.
- WSL—1175, L. Hull, Eureka, Kan.
- WSY—1950, T. W. Smith, Watonsville, Calif.
- WVP—1150, C. M. Bennett, Aurora, S. D.
- WWL—2200, R. H. Strong, Bicknell, Calif.
- WWL—1275, G. W. Perkins, Thomson, N. Y.

Buffalo Broadcasts Boom
BUFFALO, N. Y.—Estimates show that there are at the present time 40 broadcasting stations within 500 miles of Buffalo, while a year ago there were but two.

RADIO DISTANCES

To Estimate Them Quickly, Accurately

Use Cram's Detailed Radio Map covering the United States and Canada. Just one hundred miles to the inch. Map plate 30x20 inches, on sheet 34x28 inches. Latest call numbers at sides and bottom. Used by Radio Digest and other Radio Experts. Radio Districts and headquarters and time divisions. New edition now ready. Ideal for the purpose.

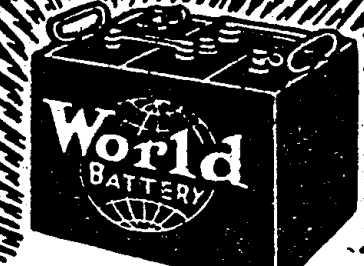
POSTPAID

Pocket Form \$0.35
Heavy Paper in Tube..... .50
Wall Style Wooden Rollers..... 1.50
On Heavy Board for Tacks..... 6.75

Special quantity prices to trade and advertisers

THE GEORGE F. CRAM CO.
111 N. Market Street
Department RD CHICAGO, ILL.

FOR YOUR RADIO



Saves you 50% of the usual cost and you get an unconditional WRITTEN 2 YEAR GUARANTEE

Best battery buy on the market today. Thousands of satisfied users.

6-Volt 40 Amp	\$8.50	6-Volt 60 Amp	\$10.00
6-Volt 80 Amp	\$12.50	6-Volt 100 Amp	\$14.50

Ask about our rubber containers

WORLD BATTERY CO.
60 E. Roosevelt Rd.—Dept. L.
CHICAGO, ILLS.

REINARTZ CIRCUIT

EVERY PART COMPLETE

1 Reinartz wound coil, 1 coil base, 1 tube socket, 1 Vernier rheostat, 1 23-plate .005 MFD variable condenser, 1 13-plate .00025 MFD variable condenser, 3 inductance switches, 25 switch points and nuts, 8 binding posts, 1 variable grid leak 1.002 MFD phone condenser, 25 feet bus bar wire, 1 high-grade Radion panel and diagram \$10.00 and complete instructions.....

FLEWELLING CIRCUIT

EVERY PART COMPLETE

2 honeycomb coils, 1 2-coil mounting, 2 coil plugs, 3 .006 condensers, 1 variable grid leak, 1 grid leak, 1 23-plate .005 MFD variable condenser, 1 Vernier rheostat, 1 tube socket, 8 binding posts, 20 feet bus bar wire, 1 high-grade RADION panel, 1 3" dial \$11.00 and diagram and complete instructions.....

ARMSTRONG REGENERATIVE CIRCUIT

EVERY PART COMPLETE

1 Litz wire variocoupler, 2 variometers, 1 tube socket, 3 3" dials, 1 Vernier rheostat, 6 binding posts, 1 inductance switch, 20 feet bus bar wire, 1 high-grade RADION panel \$12.00

- 3 Plate Variable Condenser; value, \$1.75; special at \$1.05
- 13 Plate Variable Condenser; value, \$2.50; special at 1.20
- 23 Plate Variable Condenser; value, \$3.50; special at 1.35
- 43 Plate Variable Condenser; value, \$4.50; special at 1.65
- 13 Plate VERNIER Condenser; value, \$5.50; special at 3.75
- 23 Plate VERNIER Condenser; value, \$6.00; special at 4.00
- 43 Plate VERNIER Condenser; value, \$6.50; special at 4.25
- FILAMENT RHEOSTAT—Condensite base; value, \$1.10; special at \$0.70
- FILAMENT RHEOSTAT with 2 1/4" dial; value, \$1.50; special at85
- Potentiometer with knob; value, \$1.75; special at 1.00
- Potentiometer with 2 1/4" dial; value, \$2.15; special at 1.15
- V. T. SOCKETS—Nickel brass sleeve, composition base; value, \$1.00; special at \$0.50
- Ball Bearing inductance switch; value 75c; special at30
- BEST QUALITY JACKS, Single circuit; value, 65c; special at30
- Double circuit; value, 90c; special at45
- VARIOCOUPLER—Celeron condensite and Litz Wire wound secondary; value, \$4.50; special 3.25
- THREE INCH DIALS—Unbreakable—heat resisting composition—high finish; special30
- TWO INCH DIALS—Same design—for rheostats and potentiometer; special25
- EXTRA SPECIAL—3000 OHM Telephone Headsets; \$8.00 list; reduced to 3.50
- RAYMOND VERNIER RHEOSTATS—Value, \$1.50; special95
- ALUMINUM LOUD SPEAKING HORN—Nickel plated—highly polished; \$8.00 list 3.75

Every article advertised above is guaranteed both by the manufacturer and by us—Mail orders filled immediately—transportation PREPAID. Send check or money order to:

WILLARD RADIO COMPANY
Dept. R. D. 291 Broadway, NEW YORK CITY

"WHEN happiness or calamity is about to come it can be known beforehand."
—said Confucius.

Insure complete radio happiness with a Grebe Receiver.



Doctor Hfy



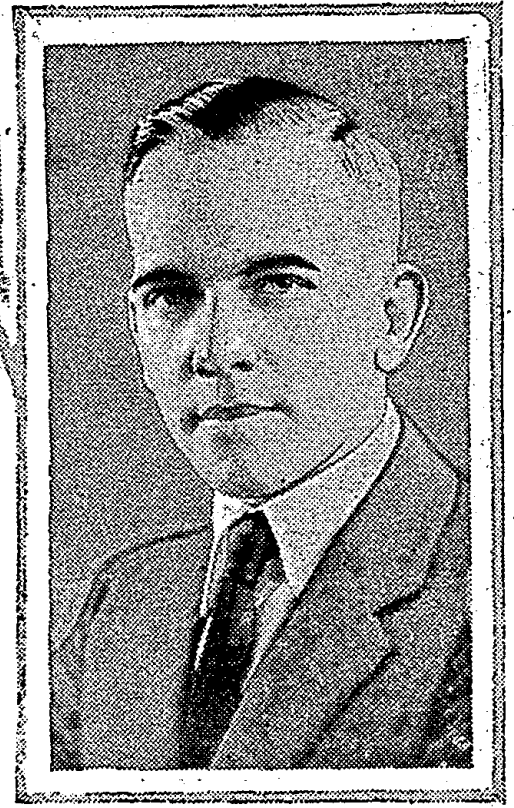
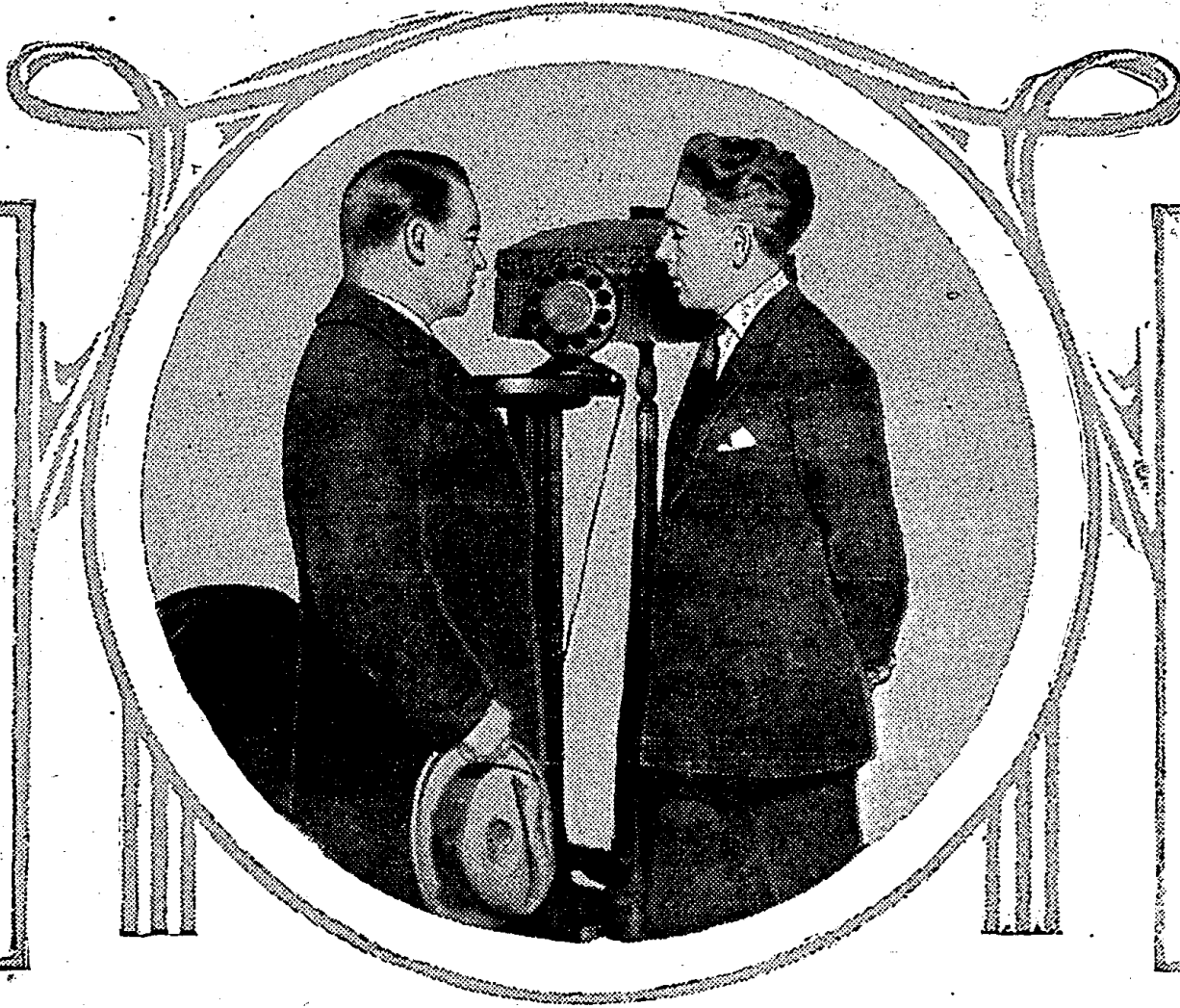
Licensed under Armstrong U. S. Pat. No. 1113149

A. H. GREBE & CO., Inc.
Richmond Hill, N. Y.
Western Branch—451 East 3rd St., Los Angeles, Cal.

IN THE AIR—HERE AND THERE

Below we have with us E. D. O'Dea, "Radiodea" as he is microphonically known, who manages and announces for WWT, McCarthy Brothers and Ford, Buffalo, N. Y. WWT was the pioneer broadcasting plant in western New York. The two gentlemen in the circle trying to talk both at once into the "mouthpiece" of WOR, L. Bamberger and company, Newark, N. J.,

are (left) Don Allen, writer of "Screenings" for the New York Evening World, and (right) J. E. Williamson, inventor of undersea motion picture photography. And below, well the daily mail of Kolin D. Hager or "K. H." as he is known in the air, contains many letters, ardent and perfumed, from the girl Radiophans. He is chief announcer and studio director of WGY



FOR OR AGAINST PHONE CLUBS?

From the Pen of a Died-in-the-Wool Member

From the Address of a Strong Anti-Clubman

By a Hard-Boiled Radiowl

Are you a "Radiowl"? If not, someone you know is, for the unique fraternity of the air founded November 22 by WSB, Radiophone broadcasting station of the Atlanta Journal, has swept the nation from coast to coast and in the few weeks of its existence many thousands of Radio "bugs" have filed application for membership and have received their "Radiowl" badges.

Station WSB, known to thousands as "The Voice of the South," was the first broadcasting station in America to conceive the idea of joining its listeners by the bonds of an air fraternity.

Object of Organization

Briefly, the "Radiowls" is a formal affiliation of the "hopeless, benighted and incurable Radio bugs who sacrifice health, home and business" to tune in with the extremely nocturnal concerts originated and inaugurated months ago by WSB, "The Voice of the South."

A message through WSB's microphone at midnight November 22 invited members of the unseen circle to apply for charter membership in the Radiowls, the first thousand applicants to receive blood-red credential cards and to be known forever as founders of the order.

Atlanta Is "Big Roost"

It was explained that Atlanta would be the big Roost; that the head of the order would be called the Big Whoo-Whoo-Whoo, that there would be various degrees of Radiowls, such as Boiled Owls, Hard-Boiled Owls, Cuckoo Owls, Buzzard Owls, Ananias Owls, Hoot Owls, Screech Owls and the like.

The only qualification for entrance into the fraternity is that applicants testify they had listened to at least twenty concerts from Atlanta's coast-to-coast station.

One Owl an Early Bird

A marvelous feature of the organization of the Radiowls is that, while Lambdin Kay, the Journal's announcer, was making the initial statement relative to the organization of the order, a listener in Mississippi called by long distance telephone and was entered as a member before Mr. Kay had left the microphone.

The thousand blood-red charter membership cards and lapel buttons were distributed in a few days after the initial announcement and many thousand have since been sent to many parts of the United States.

WSB Leads Again

WSB has "started something" again. Already other stations are organizing their regular listeners, utilizing the names of various night fowl. First it was the chime call to identify the station, later the inauguration of a slogan, "The Voice of the South," and then the first late concerts.

Of all these, however, it seems that the

Radiowls is destined to bring more attention to WSB than any of the other ventures.

FANS, DO YOU LIKE IT? YES OR NO!

Open Secrets of the WSB 10:45 Radiowls

1. The name of the brotherhood of the air shall be WSB 10:45 RADIOWLS.

2. Membership is open to all disciples of Radio who have heard at least twenty concerts from station WSB, "The Voice of the South," radiophone broadcasting station of The Atlanta Journal, Atlanta, Ga.

3. Possession of RADIOWL credentials is prima facie evidence that the owner is a hopeless, benighted and incurable Radio Bug.

4. Every RADIOWL offers the courtesies of his outfit to any visiting RADIOWL.

Every RADIOWL is automatically entitled to maximum privileges when visiting the Big Roost, Atlanta Journal Building, Atlanta, Ga.

Every RADIOWL pledges himself to introduce the wonders of radio to uninitiated blind barbarians on all possible occasions.

Every RADIOWL pledges himself to cooperate with the other RADIOWLS of his Home Roost in bringing radio entertainment to hospitals, charitable institutions, prisons, orphanages and other centers where the aged, the sick, the permanently afflicted, or otherwise unfortunate, may benefit thereby.

5. Every RADIOWL will hold a credentials card from the Big Roost, certifying that the member is a bona fide lost soul of the unseen circle.

6. The first 1,000 RADIOWLS will hold Red cards as token of charter membership. The second thousand will hold White cards, and the third and additional thousands, if any, will hold Blue cards.

7. Local roosts will be known as (town) Red, White or Blue roosts.

8. All local Roosts will be given placards signifying membership and standing.

9. The head of the RADIOWLS will be addressed as the Big Whoo-Whoo-Whoo. This job was preempted when the order was born by Lambkin Kay, Radio Director-An-

By Anti-Phone Clubman

I've been asked to say why I am prejudiced against the formation of silly clubs

nouncer, station WSB, because he thought of it before anybody else.

10. Serving in the posts of vice presidents will be the first RADIOWLS to qualify from each state in the union and in foreign countries. They enjoy the entitlement of state or national Whoo-Whoo (Mississippi Whoo-Whoo or Porto Rico Whoo-Whoo, for instance). Next in rank will be the heads of local Roosts, known as Little Rock Whoo-Whoo, for example.

11. No RADIOWL meeting may assemble before 10:45 p. m., Central Standard time.

12. The RADIOWL call will be the trilogy, "Whoo, Whoo, Whoo," chanted after the fashion of WSB's chimes, which sound the first three notes of America's war song, "Over There."

13. HE-RADIOWLS will be classed generally as Hoot Owls; she-RADIOWLS as Cuckoo Owls; juvenile RADIOWLS as Screech Owls.

14. A Boiled Owl is a RADIOWL who conscientiously testifies that he has lost one hundred (100) hours of needed sleep to listen to WSB concerts. A Hard-Boiled Owl is a RADIOWL who conscientiously testifies that his health, household, morals, or business are imperiled by Radio mania. A Buzzard Owl is a RADIOWL who has visited the Big Roost. An Ananias Owl is a RADIOWL with imagination enough to exaggerate the miracle of radio.

15. All RADIOWLS' ceremonials, initiations, elections and other activities, as well as the transmission of news of the circle, will be conducted during WSB's nightly 10:45 trans-continental concert broadcast.

17. Other officers, titles, degrees, penalties and the like will be introduced and established from time to time, depending upon the happy notions that RADIOWLS may send in to the big roost.

18. WSB 10:45 RADIOWLS modestly admits being the first thing of its kind since Adam.

of a tawdry nature by broadcasting stations. My reasons against the clubs, from which several famous long-distance Radiophone plants seem to be having "great gobs" of fun, are very well stated by Ellis Chaney, vice president of the Southern Equipment Company, San Antonio, Texas, operators of Station WOAI. He is strongly opposed to such clubs and has made an other address on the subject. Here is what he has to say:

"Every owner of a receiving set which has a range of 300 miles and over is entirely familiar with the recent idea of some broadcasting stations organizing so-called clubs. It has been suggested to us by some that Station WOAI should fall in line and organize a club—one gentleman going so far, in an effort to co-operate with us, as to outline briefly by letter the character of matter to be broadcast.

"He also suggests a name for the proposed club, and if we were going to undertake the club idea we would be very much interested to consider the plan and we want to thank this gentleman, whose name is unknown to us, for his interest shown and compliment him on the original and amusing article which he submits as a proposed opening or introductory announcement.

Clubs Bore Fans; Lose Dignity

"In our opinion, the novelty quickly wears off and listeners in become tired and weary, and, in fact, provoked with the reading of names and addresses of those who have written a station in application for membership in a club, or, for that matter, regarding having heard their broadcasting.

"We think stations such as KSD of the St. Louis Post Dispatch are apt to retain the best will of Radio receiving set owners simply because they maintain their dignity by not broadcasting anything except features of general interest, such as high-class music, current news items, market reports and weather forecasts, without sidelights, and we are always pleased when we are able to tune in on such a station and we admire and compliment them for dignity and respect for those people who have Radio sets in their homes.

Abuse of Broadcast License

"We believe it is an abuse of the privileges granted under a Government license to perpetrate various nuisances on the Radio public in the form of ridiculous attempts at wit and humor, which is nothing more or less than plain shoddy advertising, which we hope will soon be more closely supervised by the United States Department of Commerce officials.

Acknowledge Communications by Mail

"We greatly appreciate receiving communications from listeners in who have

(Continued on page 6)

VISITING DAY, CODE PRACTICE AT WGI

GIVES FANS CHANCE TO SEE "HOW IT'S DONE"

15-Minute Period Daily Introduces Listeners In to Dot-Dash Mystery

MEDFORD HILLSIDE, MASS.—A "Radio Visiting Day" has been established at Station WGI, of the American Radio and Research Corporation here, whereby New England Radiophans may visit the station and see how broadcasting is done, and how a Radiophone plant is operated. People who nightly listen to this or that broadcasting station have a certain curiosity to see what the station and the announcers look like, as well as how the "thing" works.

Heretofore, the main reason why the big broadcasters have not invited their audience to visit them has not been because they were not wanted, but because there was not sufficient space to accommodate all those who might care to come.

This main difficulty has been eliminated at the WGI studio by a drawing system which, it is believed, will be adopted, with more or less modification to fit local needs, by other broadcasting stations all over the country.

Draw from Applications; Broadcast Winners

The drawing system works as follows: Those desiring to visit the broadcasting station are invited by Radiophone to make application. These applications are numbered. Then a list of numbers is put in a hat and a drawing is made by a committee. Those numbers selected are the invited guests of WGI at the first convenient date.

The visiting plan was first put in operation at the station recently when at 10:20 P. M. Eastern time, Announcer "HDM" broadcast that all letters received before 6 P. M. the next night would be included in the first drawing. Over 500 letters were received, including special deliveries and telegrams. One resident within a few miles of the station came over in person, his automobile being the first to break through the drifts on the street of the broadcasting studio after a heavy snowfall.

Code Signal Practice Period

Another new WGI feature is its code practice period. A desire on the part of many of the Radio audience for practice in the reception of code signals has encouraged WGI to insert a 15-minute period in its program each evening for this particular purpose. In answer to a query broadcast some weeks ago, asking if the fans desired this instruction, over 300 replies were received and almost as many telephone calls.

The Radio audience seems eager to know what the mysterious dots and dashes are saying. One or two letters read: "If we must listen to that darned buzzing, let us know how to interpret them."

It is believed that practice in the code will lead many Radiophans now interested mainly in the broadcasting to become real "DX" enthusiasts in amateur work. These lessons are planned for Monday, Wednesday and Friday at 6:15 p. m. Each lesson will be repeated the night following at 6:45 p. m.

An article in the New York Times estimates that before the close of the coming winter 3,000,000 Radio sets will be in use and the concerts will have a total audience of at least 50,000,000 persons.

Book Reviews

Vacuum Tube Receivers. By O. F. Heslar. A book that tells how to make a simple set. How to make the cabinet. It includes a 27 by 36-inch layout blue print. Price, 75 cents.

The Armstrong Super-Regenerative Circuit. By George Eltz, Jr., E. E. This is a De Luxe edition of this famous circuit. Profusely illustrated and fully explained. Fifty-two pages. Price, \$1.00.

Radio Receivers for Beginners. By Snodgrass and Camp. Answers the universal question, "How can I receive Radio?" Price, \$1.00.

Elements of Radiotelegraphy. By Elery W. Stone. The text was written for the guidance and instruction of Radio students in the communication service of the Navy. It is an instruction book for Radio schools. Price, \$2.50.

Radio for the Amateur. By A. H. Packer and R. R. Haugh. The underlying principles of Radio thoroughly explained in simple language and understandable illustrations. This book will teach you how to construct and operate a receiving set successfully. Price, \$1.50.

Radio Communication. By John Mills. The fundamental principles and methods upon which recent developments are based are emphasized. The vacuum tube is treated in a simple, fundamental and up-to-date manner. Present methods and tendencies of the art are explained in a chapter which is non-mathematical. Price, \$2.00.

The A B C of Vacuum Tubes. By E. H. Lewis. Is a book for beginners who have no knowledge of either Radio or electricity and sets forth the elementary principles of theory and operation of the vacuum tube. No attempt has been made in this book to describe all the possible circuit arrangements, but those shown may serve as suggestions to experimenters who desire to evolve their own circuits. Price, \$1.00.

Experimental Wireless Stations. By S. E. Edelman. This book assumes that the reader has some knowledge of fundamental electricity and mathematics and is a readily understandable text for beginners in the art of Radio communication who desire to start with the elements. Earlier editions of this book were published during the war. The 1922 edition has been revised and enlarged so as to cover the

CRL VAR. GRID LEAK FLEWELLING

Also Standard Lines
DEALERS WRITE FOR DISCOUNTS
DUNGAN RADIO CO.
Distributors
68 WEST WASHINGTON ST., CHICAGO

"ALL-AMERICAN" Amplifying Transformers

Two years of successful use all over the world guarantees permanent satisfaction. Radio and Audio Frequency.

Send for Circulars
Rauland Manufacturing Company
35 South Dearborn Street Chicago

FORMICA

A Laminated Phenolic Condensation Product
SHEETS TUBES RODS
RADIO PANELS
POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

1/32" THICK	1/2¢	PER SQ. INCH
1/16" THICK	3/4¢	PER SQ. INCH
3/32" THICK	1¢	PER SQ. INCH
1/8" THICK	1 1/2¢	PER SQ. INCH
3/16" THICK	2¢	PER SQ. INCH
1/4" THICK	2 1/2¢	PER SQ. INCH
3/8" THICK	4¢	PER SQ. INCH
1/2" THICK	5 1/4¢	PER SQ. INCH

SEND FOR COMPLETE PRICE LIST
PROMPT ATTENTION TO MAIL ORDERS
DEALERS PRICES ON APPLICATION

STARRETT MFG. CO.
519 SOUTH GREEN ST. CHICAGO

progress made in the last few years. Price, \$3.00.

The book department of the Radio Digest is prepared to send you any of the books on Radio published, whether listed in our Book Review or not. Let us know what book you want, send us your check and we will see that the book is mailed to you. Postage stamps in payments for books not accepted. Send money order or check. Book Department, Radio Digest Illustrated, 123 W. Madison St., Chicago, Ill.

FOR OR AGAINST?

(Continued from page 5)
heard our programs and we invariably and immediately pass all complimentary letters on to the artists who perform over WOAI, and it pleases these artists, just as applause would from an audience in a hall or theater.

"We not only do this, but a great many of such letters and cards are printed by the San Antonio Evening News and Express, which, in a general way, acknowledges receipt to the sender, but we also acknowledge every letter and card we receive by mail, sending our appreciation and our broadcast schedule.

One's Fun Is Bother for Many

"We have received many thousands of cards and letters from all over the continent and have them filed by states or countries and we are very proud of them and want more and will appreciate, in the future as in the past, the thoughtfulness which prompts anyone to write, but we believe the fan also appreciates the fact we should not spoil many people's entertainment by reading each card, in spite of

TUNE IN

Join our radio club and save money on sets and parts. Write us your wants and worries.
Radio Supply and Electric Co.
116 West 29th Street, Wilmington, Delaware.

CRL VAR. GRID LEAK

1/4 to 10 megohms

KLENTZ RADIO CO.

Exclusive Distributors
508 South Dearborn St.
Room 770 Wabash 1380
Chicago

the fact the individual might be interested to hear his name sent through the air.

"Next to almost incessant interference of the amateur telegraph 'worker'—frequently entirely unwilling to co-operate and regardless of the laws regulating his license, if he has one, respecting the wave length he may use and that he should always remember it is unsportsmanlike to unnecessarily interfere with rightful pleasure of thousands—the biggest detriment to and nuisance in Radio is the broadcast station which is constantly indulging in 'horse play' of the nature just mentioned. If we were going to pray together we would request you to join us in a prayer that a remedy for both of these impositions is shortly found."

Honor Columbus Council Woman

COLUMBUS, O.—Olga Anna Jones, Columbus' first woman member of the city council, was the speaker at the regular forum program of Station WPAL, the Superior Radio and Telephone Equipment company. The broadcast by Miss Jones was given in connection with a program made up especially for her benefit. Secretary of State Thad H. Brown, also was heard on the Friday-forum broadcasting program.



KELLOGG RADIO FOR BETTER RESULTS

KELLOGG SWITCHBOARD & SUPPLY COMPANY

Chicago

RADIO

Manufacturer Direct to You

SOMETHING NEW EVERY WEEK

LOWEST PRICES—HIGHEST QUALITY

Everything guaranteed as represented. We pay the postage

THIS WEEK'S LEADER

Sale on Honeycomb Coils

Complete set consisting of 16 coils ranging from 25 to 1500 turns regular value \$18.45. Sale Price. \$11.45

Fine workmanship and wire on these coils. Here is a real opportunity

Lattice Wound Variometers.....	\$2.95
Lattice Wound Vario Couplers.....	\$2.95
50 turn Honeycomb Coils.....	.31c
75 turn Honeycomb Coils.....	.35c
Grewol Crystal Detectors.....	\$1.50

BALDWIN TYPE C LOUD SPEAKER UNITS (with long cord)..... **\$4.65**

\$4.00 NEW TYPE VARIOMETERS (less capacity effect). (Wooden stators eliminated)..... **\$2.95**

Freshman Variable Grid Leaks.75c	Switch levers	19c
Potentiometers with taper knob	Bakelite V. T. Sockets.....	42c
.....\$1.25	Rubber knob B. posts.....	45c doz.
W. D. 11 adapters.....	75c 4 phone connectors.....	42c
.....50c	Vernier dial controls.....	42c
3 coil mountings with knobs.\$3.25	Two-inch dials.....	19c
2 coil mountings with knobs.\$2.65		
Single panel mountings.....		
.....36c		

Complete Parts for REGENERATIVE CIRCUIT
1 vario coupler, 2 variometers, 1 rheostat, 1 tube socket, 3, 3-in. dials, 6 binding posts, 1 inductance switch, 20 feet connecting wire, 1 panel. Complete for..... **\$11.95**

All orders filled promptly. We are swamped with orders from satisfied customers. A trial will convince you that we treat you right. Always glad to answer questions or give information.

The House of Service and Quality

Manufacturer's Outlet Company

Moco Products 28 South Wells St., Chicago, Ill.

How to build the Reinartz Receiver

is told, complete with illustrations and diagrams, in the latest addition to our FREE looseleaf, handbook-catalog now on the press.

Amateurs find the Reinartz hookup by far the simplest yet designed. In efficiency it rivals the Armstrong and other well-known circuits.

All the parts necessary for building your Reinartz Receiver are listed in the "Chi-Rad" handbook-catalog—save yourself the trouble of shopping around.

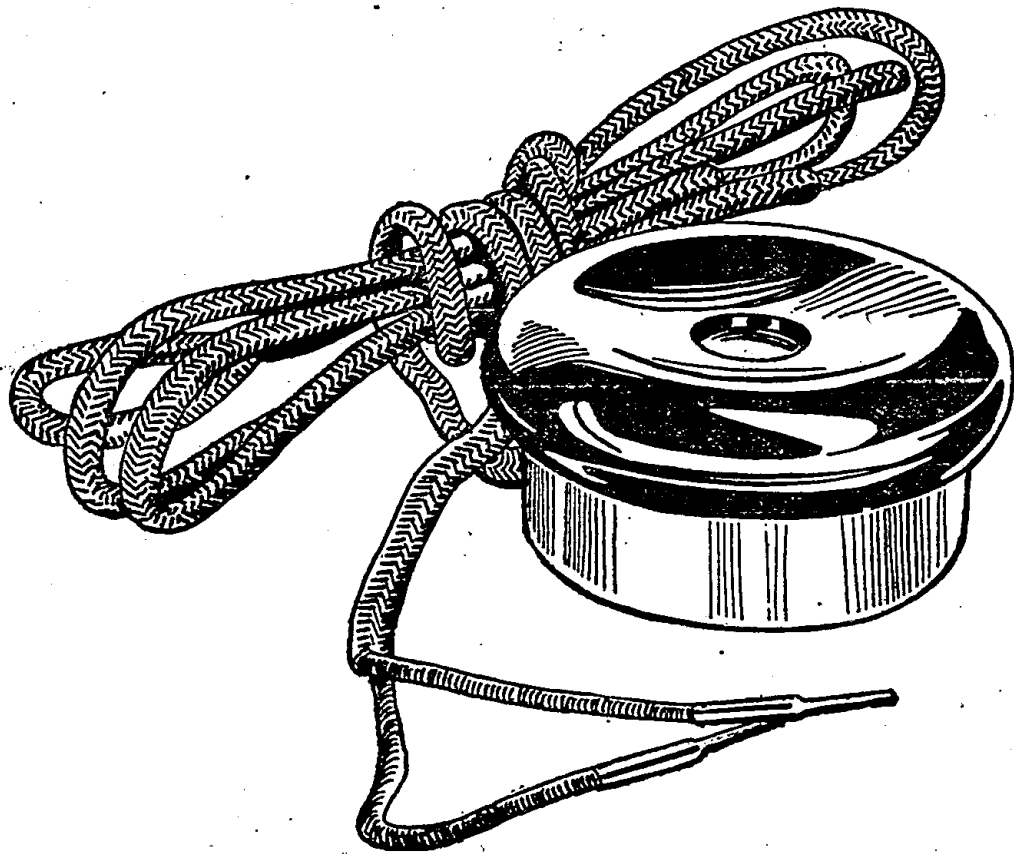
Write for your copy today—ask for "Chi-Rad" Handbook, Edition RR.

Chicago Radio Apparatus Co.
415 So. Dearborn Street
CHICAGO



The Radiophonist's Mart

Single Phone for Loud Speaker



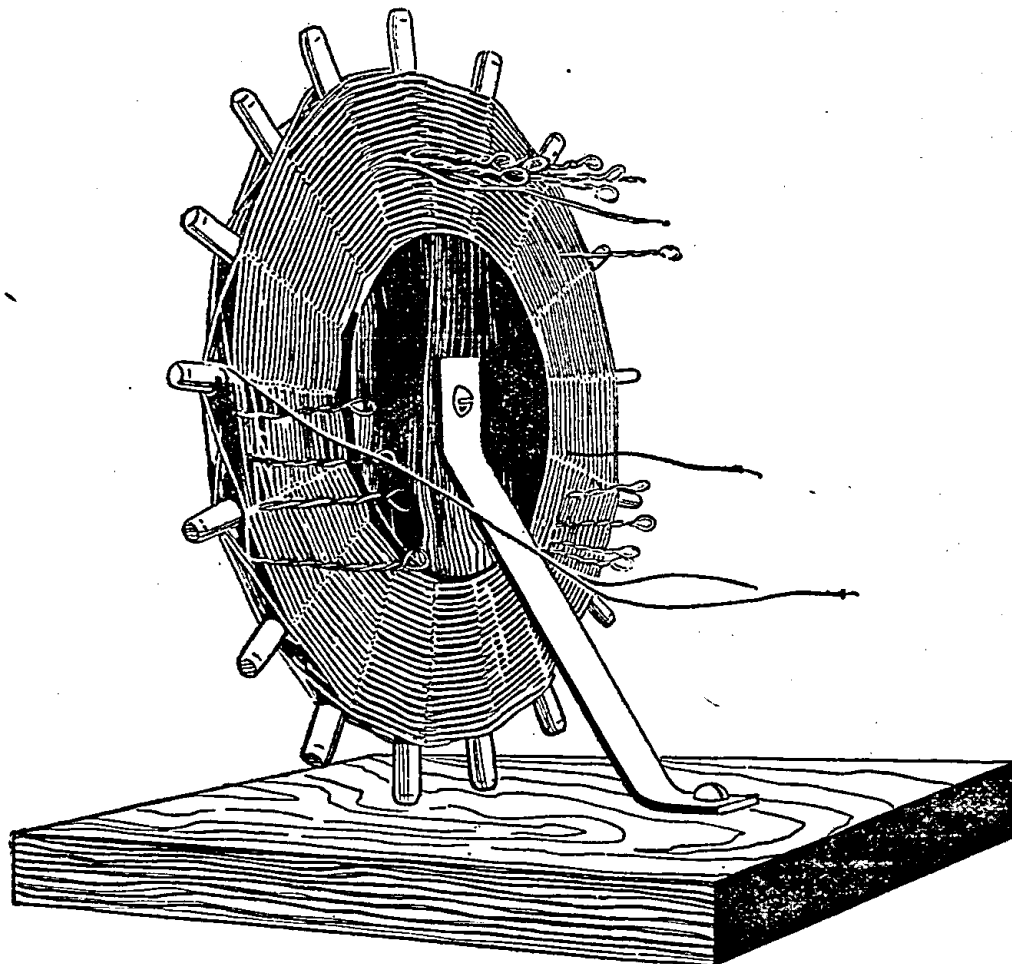
DUE to the rather high cost of loud speakers, many fans have attempted to construct their own loud speaker horns and simply add a good loud speaker phone. One of these telephones, produced by the Radio Industries Corporation of New York, N. Y., is shown in the illustration. This phone has a very clear sound and reproduces the higher notes without the chattering found in some others. Instead of the usual two-pole piece construction, only one spool is used. This brings the pull in the mathematical center of the diaphragm.

Less energy is necessary to pull this down than if the pull was away from the center. The further away the active pole pieces are, from the center, the more energy is required to pull down the diaphragm. In addition to this, there is a return magnetic circuit, due to the peculiar construction of the magnet, which extends to both sides of the shell. There is no active pull at the end of these poles, but the magnetic flux returns through the diaphragm, giving a finely balanced magnetic circuit.

The telephone has a heavy aluminum shell with a hard rubber composition cap and a non-rusting, spherulized diaphragm. The windings have a high resistance.

The phone is also furnished with a five-foot cord, the two tips of which are provided with a tag marked "very important," stating that the colored cord terminal should be connected to the positive B battery circuit as this will then permit the lines of magnetic force to follow the magnetized polarity of the receiver, and thus avoid the demagnetizing effects of a reversal of polarity which would ultimately wear down the efficiency of the receiver.

Coil Unit for Reinartz Circuit



TAKING into consideration the popularity of the Reinartz circuit, all Radiophans will be interested in the spider web coils, made for use in same. The coil shown in the illustration uses a circular wooden core on which seventeen wooden spokes or dowels project radially about 1 1/2 inches from the surface. A green double silk covered wire is used in the winding and is provided with a brass mounting bracket, so that it can be fastened to the base with the coil upright as shown in the illustration. Four taps and two end connections are provided for the inner, or plate coil winding. The primary winding has an end connection and nine taps, while the outer or secondary winding, in series with the primary, has three taps and an end connection.

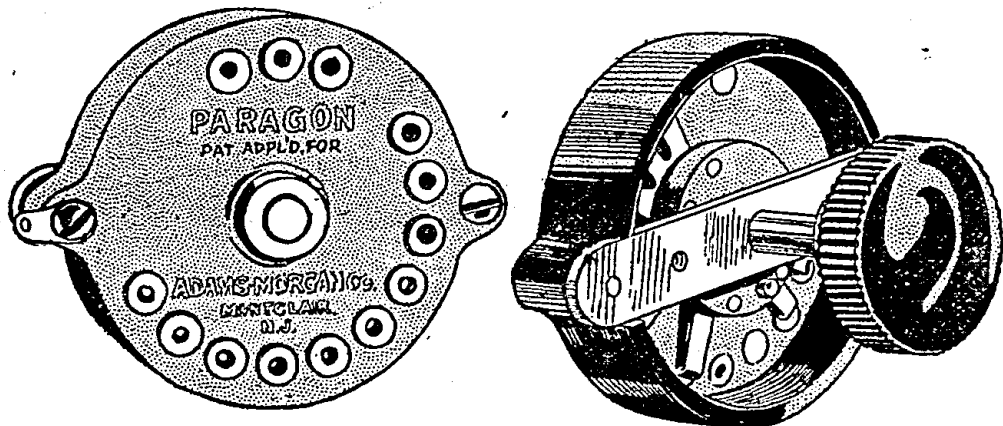
The taps are long enough that soldered connections can be made without the danger of running the solder or flux on the rest of the coil, thus shorting some of the turns. In addition the advantage of the upright mounting eliminates the possibility of the solder dropping into the

windings. By setting the tap side towards the panel when mounting it on the base, the lead lengths are reduced to a minimum.

The neatness of appearance and good workmanship are attractive features of the coil. It has been placed on the market by Hudson-Ross, Chicago, Ill.

The positive connection of your B battery always goes to the plate of your audion, although it can go through the telephones and then to the plate.

Compact Stage Control Switch



NOT only has there been a marked development in types of circuits used by amateurs in building their own sets, but of late there has been a decided tendency toward the construction of higher grade and more practical apparatus, compact in form, but which will function over a field that formerly required three or four units. An example of this trend of development is shown in the Paragon stage control switch, manufactured by the Adams-Morgan company of Upper Montclair, N. J.

This unit, as shown in the illustration, not only permits the change over from detector to any of the two stages of amplification, but also combines the filament control features. In this way, it eliminates the necessity of three jacks and the usual phone plug and adds a knob and pointer to the front of the panel instead of the three jack holes. The framework is a molded job with fourteen lug connections. The rotating element consists of a 10-arm, fan-type switch, automatically engaging with the contact points connecting to the terminal lugs, which are so interconnected that the windings of the transformers are thrown in or out of the circuit as required for the stage which the pointer indicates.

A metal bar across the framework acts as a bearing for the rotating shaft and also provides for panel mounting by means of two screws which are fastened to it on each side of the shaft hole. In this way the actual mounting of the instrument simply requires a drilling of three

holes. A diagram is furnished with each instrument showing just how to connect the switch in a detector, two-stage amplifier circuit. A recommendation is made that the user see that the outside terminals of the primary and secondary windings of the terminals are connected respectively to the plate and grid of the vacuum tubes. Unless this precaution is observed, howling will result, due to audio frequency oscillations in the circuits. In the case of the primary windings, this connection need not be direct.

Your set will act differently at different times and under varying conditions, but this time of year is good.

Radio Tubes

<p>DETECTOR \$3.50</p> <p>AMPLIFIER \$4.00</p>	<p>Send today for best 6-volt tubes you ever used, and save money. Absolute satisfaction guaranteed or your money back. Immediate shipment. Cash or C. O. D.</p> <p style="text-align: center;">BARSTA RADIO CO. GRAND RAPIDS, MICH.</p>
--	---

IMPROVED REINARTZ CIRCUIT

My highly improved and copyrighted circuit brings in all important stations on both coasts and the Mexican border without any distortion or other noises. We dance to music from Atlanta received on one loud Baldwin unit. Build one of these supersensitive sets from my blueprints and specifications. Price 50c or with a perfect and complete double wound spiderweb coil \$3.00 by mail. No other windings used. Photo of my set on a glass panel with every order. Everything clearly shown. Cheap and easy to build. Easy to operate.

S. A. TWITCHELL, 1925 Western Av., Minneapolis, Minn.



Carter "TU-WAY" Radio Plug

take two head sets and all types cord tip terminals. Price \$1.50. Write for Bulletin on Carter "HOLD-TITE" Jacks and other products. CARTER RADIO COMPANY, 289 South State Street, CHICAGO

MOUNTING BOARDS for ATWATER-KENT

STANDARD SIZES
DEALERS WRITE FOR DISCOUNT
DUGAN RADIO COMPANY
68 WEST WASHINGTON STREET

RADIO SUPPLIES STORES

Prompt Service—Quality Goods—Priced Right
Radio Division
TELEPHONE MAINTENANCE CO.
20 S. Wells St. Franklin 3986
5206 W. Madison, Austin 7041. 1122 E. 47th St
Look for the TELMACO Sign

MAGNAVOX Radio

The Reproducer Supreme

IN Radio, there are no substitutes for the Magnavox electrodynamic principle.

When you purchase Magnavox apparatus you assure yourself the utmost satisfaction.

R-2 Magnavox Radio

with 18-inch horn - (as illustrated)

For store demonstration, large audiences, dance halls, etc. . \$85.00

R-3 Magnavox Radio

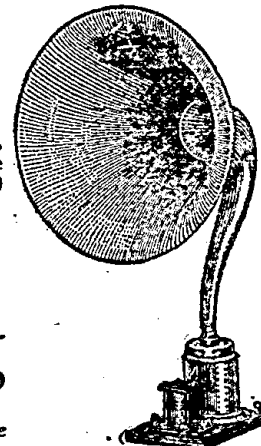
with 14-inch horn

For homes, offices, amateur stations, etc. \$45.00

At good dealers everywhere

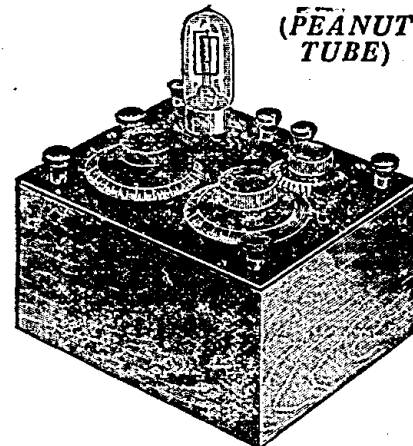
THE MAGNAVOX CO.
Oakland, Cal.

New York Office
370 Seventh Ave.



WD-11 OUTFIT

(PEANUT TUBE)



This wonderful dry battery outfit with a range of 600 miles comes to you ready to assemble, panel drilled and marked, mahogany finished box, condenser ready to screw in place. Variocoupler wound complete, rheostat, dials, binding posts, socket, wire screws and picture diagram for wiring, all at above price.

\$13.85

WD-11 Tubes\$5.85
Head Phones.....\$4.50 and up
Two-stage Amplifier Box complete to match the above.....\$14.15
Postage extra on four pounds. No personal checks received. Let us quote on your wants.

RADIO PARTS CO.
8 So. Austin Boulevard, CHICAGO, ILL.

Radiophone Broadcasting Stations

Corrected Every Week—Part III

State, City, Call	State, City, Call	State, City, Call	State, City, Call	State, City, Call	
Alabama: Auburn, WMAV Birmingham, WOAY, WSY Mobile, WEAP Montgomery, WKAN Arizona: Phoenix, KDYW, KFAD, KFCE Tucson, KDZA, KFDD Arkansas: Fort Smith, WCAC, WGAR Little Rock, WCAV, WEAX Pine Bluff, WOK California: Altadena, KGO Bakersfield, KDZE, KYI Berkeley, KQI, KRE Del Monte, KLN El Monte, KUY Eureka, KNI Fresno, KDZH, KMJ Glendale, KFAC Hanford, KFBD Hollywood, KFAR Long Beach, KSS Los Angeles, KDZF, KDZP, KFCL KFI, KHJ, KJS, KNN, KNU, KOG, KUS, KWH, KXS, KYJ Modesto, KXD Oakland, KFBN, KLX, KZM Pasadena, KLB Redding, KFAZ Richmond, KFDM Sacramento, KFBS, KVO San Diego, KDPT, KDYM, KDYO, KFBC, KFFA, KON San Francisco, AGI, KDN, KDZG, KDZV, KDZK, KFDB, KLP, KLS, KPO, KSL, KUO, KZY San Jose, KFAQ, KQW, San Luis Obispo, KFBE Santa Ana, KFAW Santa Barbara, KFHI Stanford Univ., KFGH Stockton, KJQ, KWG Sunnyvale, KJJ Taft, KFEB Venice, KFAV Colorado: Boulder, KFAJ Colorado Springs, KFFQ, KFBU, KFCK, KHD Denver, DD5, DN4, KDZQ, KEEP, KFAF, KFDL, KLZ Pueblo, KFGE Trinidad, KFBS Connecticut: Bridgeport, WKAX Greenwich, WAAQ Hartford, WDAK Middleton, WOAS New Haven, WGAH, WPAJ Waterbury, WQAD Delaware: Wilmington, WHAV, WOAT, WPAW District of Columbia: Washington, WDM, WEAS, WHAQ, WIL, WIAY, WJH, WMU, WPM, WWX Florida: Jacksonville, WDAL Miami, WFAW, WIAZ, WQAM Pensacola, WGAN, WLAV Tampa, WDAE, WEAT, WHAW West Palm Beach, WKAH	Georgia: Atlanta, WGM, WSB College Park, WDAJ Decatur, WAAS Gainesville, WKAY Macon, WGAK, WMAZ Savannah, WHAO Idaho: Boise, KFAU, KFDD Moscow, KFAN Thomasville, WPAX Wallace, KFCC Illinois: Belvidere, WOAG Carthage, WCAZ Chicago, KYW, WAAE, WBU, WDAW, WJAZ, WMAQ, WPAW, WCAP, WHAP Galesburg, WRAM Mattoon, WQAL Peoria, WJAN Quincy, WCAW Rockford, WLAB Springfield, WDAC Tuscola, WDS Urbana, WRM Indiana: Anderson, WEAW Evansville, WNAM, WOAU Fort Wayne, WFAZ Greencastle, WLAX Huntington, WHAY Indianapolis, WLK, WOH Marion, WIAQ Mishawaka, WBAQ Muncie, WJAF Richmond, WOX South Bend, WGAZ Terre Haute, WEAC West Lafayette, WBAA Iowa: Ames, WOI Burlington, WIAS, WLAT Cedar Rapids, WJAM, WKAA Centerville, WDAX Council Bluffs, WPAF Cresco, WNAG Davenport, WHAI, WOC Des Moines, WGF, WHX Dubuque, WQAK Fort Dodge, WEAB Iowa City, WHAA Le Mars, WIAU Marshalltown, WLAR Newton, WIAH Shenandoah, WGAJ Sigourney, WOAD Sioux City, WEAU, WHAE Vinton, WIAE Waterloo, WHAC, WMAR, WRAN Kansas: Anthony, WBL Atwood, WEAD Beloit, WPAR Eldorado, WAH Emporia, WAAZ Hutchinson, WLAS Independence, WFAJ Liberal, WMAG Manhattan, WNAK, WTG Marion, WRAD Parsons, WOAJ Salina, WFAD Topeka, WJAG, WPAW Wichita, WAAW, WEAH, WVEY Kentucky: Bowling Green, WNAB Frankfort, WQAK Lexington, WQAH	Louisville, WHAS, WKAG, WLAP Paducah, WIAR Louisiana: New Orleans, WAAB, WAAC, WCAG, WGV, WIAT, WWL Shreveport, WGAQ Maine: Auburn, WMB Bangor, WPAW Houlton, WLAN Portland, WJAL Maryland: Baltimore, WCAO, WEAR, WKC, WNAV Frostburg, WPAQ Massachusetts: Boston, WAAJ, WFAU, WNAC Dartmouth, WMAF Medford Hills, WGI New Bedford, WDAU Springfield, WBS Worcester, WCN, WDAS Michigan: Ann Arbor, WMAX, WQAJ Bay City, WTP Dearborn, WVI Detroit, KOP, WCX, WWJ East Lansing, WKAR Flint, WEAH Kalamazoo, WQAP, WLAQ Lansing, WHAL Laurium, WPAV Rogers, WCAF Saginaw, WIAW Minnesota: Duluth, WJAP, WMAT Hutchinson, WFAN Minneapolis, WBEA, WBAH, WCAS, WLAG, WLB Moorhead, WPAU Northfield, WCAW St. Cloud, WFAM St. Paul, AV7, WAAH Missouri: Butler, WNAR Cameron, WFAQ Cape Girardeau, WSAB Columbia, WAAN Independence, WPAQ Jefferson City, WOS Joplin, WHAH Kansas City, WDAF, WHB, WMAJ, WQQ, WPE Marshall, WJAT Rockport, WMAD St. Joseph, WEAK, WEB, WEW, WMAJ, WRAO Springfield, WIAI, WKAS, WQAB Tarkio, WIAT Webster Grove, WOAL Montana: Billings, KFCH Butte, KFAP Great Falls, KDYS Havre, KFBE Polytechnic, KFED Nebraska: David City, WRAR Fremont, WQAE Hastings, WQAY Lincoln, WFAV, WGAT, WJAB, WKAC, WLAF, WMAH, WQAP, WSAS Norfolk, WJAG	Omaha, WAAW, WDV, WIAM, WNAL, WOAW, WOU, WOV Rushville, WEAV Tecumseh, WTAU University Place, WCAJ Nevada: Reno, KDZK, KFAS New Hampshire: Laconia, WKAV New Jersey: Atlantic City, WHAR Camden, WRP Jersey City, WAAE, WNO Moorestown, WBAF Newark, WAAM, WBS, WJZ, WOR N. Plainfield, WEAM Ocean City, WIAD Paterson, WBAN Roselle Park, WDY Trenton, WMAL, WOAX New Mexico: Roswell, KNJ State College, KOB New York: Albany, WNJ Amsterdam, WPAS Binghamton, WIAV Buffalo, WGR, WWT Canton, WCAD Cazenovia, WMAC Ithaca, WEAI Lockport, WMAK Newburgh, WCAE New York, KDOW, WBAJ, WDT, WEAF, WJX, WLAU, WWZ Poughkeepsie, WFAF Rochester, WHAM Ridgewood, WHN Schenectady, WGY, WRL Syracuse, WDAI, WFAB, WLAH, WNAN Tarrytown, WRW Troy, WHAZ Utica, WSL Waterford, WFAG North Carolina: Asheville, WFAJ Charlotte, WBT Raleigh, WLAC North Dakota: Fargo, WDAY, WPAK Grand Forks, WOAB Mayville, WRAC Wahpeton, WMAW Ohio: Akron, WOE Canton, WWB Cincinnati, WAAD, WHAG, WIZ, WLW, WMH Cleveland, KDPM, WHK, WJAX Columbus, WBAV, WCAH, WEAU, WMAN, WPAW Dayton, WAI, WJAJ Defiance, WCAQ Fairfield, WL2 Granville, WJD Hamilton, WBAU, WRK Lebanon, WPG Lima, WOAC Marietta, WBAW Sandusky, WQAF Springfield, WLAM, WNAP Stockdale, WJAK Toledo, WJK Warren, WLAV Washington C. O., WGAX Wooster, WGAU Youngstown, WAAJ Oklahoma: Ardmore, WQAA	Enid, WNAF Muskegee, WDAV Norman, WNAD Okemah, WKAK Oklahoma City, WKY, WMAB Okmulgee, WPAC Tulsa, WEH, WLAL Oregon: Astoria, KFBM, KFGG Corvallis, KFDD Eugene, KFAT Hood River, KQP Marshfield, KFBB Medford, KFAY Pendleton, KFFE Portland, KDYQ, KFEC, KGG, KGN, KGW, KQY Salem, KFCD Pennsylvania: Altoona, WGAW Brownsville, WDAQ Clearfield, WPI Crawton, WAAZ Easton, WMAP Erie, WOAV Grove City, WSAJ Johnstown, WTAC Lancaster, WGAL McKeesport, WIK Parkersburg, WQAA Philadelphia, WCAU, WDR, WFI, WGL, WIP, WNAT, WOO, WWAD Pittsburgh, KDKA, KQV, WCAE, WHAF, WJAS Scranton, WLAO, WQAN, WRAY State College, WPAB Villanova, WCAM Wilkes-Barre, WBAX, WKAZ, WNAH Rhode Island: Cranston, WKAP Edgewood, WEAG East Providence, WKAD Providence, WEAN, WJAR South Carolina: Charleston, WEAZ, WNAQ, WOH Orangeburg, WGAM South Dakota: Rapid City, WCAT Sioux Falls, WEAT Vermillion, WEAJ Yankton, WAJU, WNAJ Tennessee: Knoxville, WNAV Lawrenceburg, WOAN Memphis, WKN, WMC, WPO Texas: Abilene, WQAG Amarillo, WDAG, WRAU, WRAU Austin, WCM, WNAS Beaumont, WMAM College Station, WTAU Dallas, WDAO, WFAA, WRR El Paso, WDAH, WPAT Fort Worth, WFAZ, WPA Galveston, WHAB, WIAC Houston, WCAK, WEAJ, WEV, WGAB, WRAA, WSAV Laredo, WWAX Orange, WKAL Plainview, WSAT Port Arthur, WFAH San Antonio, AS6, DM7, WCAR, WOAI Stanford, WQAZ Tyler, WQAF	Waco, WJAD, WLAJ, WWAC Wichita Falls, WKAF Utah: Ogden, KDZL, KFCE Salt Lake City, KDYL, KDYV, KZN Vermont: Bellows Falls, WLAK Burlington, WCAX Springfield, WQAE Virginia: Blacksburg, WEAE Fortress Monroe, WNAW Portsmouth, WQAO Washington: Aberdeen, KNT Bellingham, KDZR Centralia, KDZM Everett, KDZZ, KFBL Lacey, KGY Pullman, KFAE Seattle, KDZE, KDZT, KFC, KHQ, KJR, KTW, KZC Spokane, KFDC, KFZ Tacoma, BEI, KFEB, KFBJ, KGB, KMO Walla Walla, KFCE Wenatche, KDZI, KZV Yakima, KFV West Virginia: Arlington, NAA Clarksburg, WHAK Morgantown, WHD Wisconsin: Beloit, WKAW Kenosha, WOAR Madison, WGVY, WHA Milwaukee, WAAK, WCAJ, WHAD, WIAO Neenah, WIAJ Superior, WFAC Waupaca, WPAH Wyoming: Casper, KFCE, KFDF Laramie, KFBU Alaska: Fairbanks, WLAY Hawaii: Honolulu, KDYX, KGU, KYQ Puerto Rico: Ensenada, WGAD San Juan, WKAQ Canada: Calgary, CHBC, CHCQ, CFAC, CFCA, CJCY Edmonton, CJCA Fort Frances, CFPC Halifax, CFCE, CJCS Hamilton, CKOC Iroquois Falls, CFCH Kitchener, CJCF London, CFCF, CHCS, CJGC, CKQC Montreal, CFCF, CHCX, CHYX, CJBC, CKAC Nelson, CJCB Ottawa, CHX Regina, CKCK St. John, CJCI, CKCR Toronto, CFCA, CFCE, CHCB, CHVC, CJCD, CJCH, CJCN, CJSC, CKCE, CKZK, CKKZ Vancouver, CFCE, CFYC, CHCA, CJCE, CKDZ Winnipeg, CHCF, CJCG, CKCB, CKZK, CJNC Cuba: Havana, PWX

(NOTE.—The third and last part of the schedule list appears below. Next week the first part will appear.)

WLC, Indianapolis, Ind. 485 also. 500 ml. Hamilton Mfg. Co. Daily ex Sun. 11-11:30 am. 12-12:30 pm, 2-2:30, 3-3:30, 5-5:30, reports. Tues, Thurs, 8:30-10 pm. concert. Sun, 2-4 pm. 8:30-10. Central. 8:30-10 pm. concert. Sun, 2-4 pm. 2,000 ml. Crosley Mfg. Co. Daily ex Sun, 10 am-3 pm, music, reports. Tues, Fri, 8:40-30 pm, Thurs, 10-12 pm, music, news. Sun, 11 am, church service. Central.

WNAB, Oklahoma City, Okla. 500-mi. Radio Supply Co. Daily ex Sun, 9:30-10:30 pm, music. Fri, 11:30-12:30 pm. Central.

WNAC, Cazenovia, N. Y. 330, 250, 275 only. 500 ml. C. B. Meredith. No definite schedule.

WNAD, Rock Port, Mo. Atchinson County Mail. WNAF, Dartmouth, Mass. Round Hills Radio Corp.

WNAG, Liberal, Kan. 75 ml. Tucker Elec. Co. Daily ex Fri, Sun, 7:30-8:30 pm, music, news. Fri, 8-9 pm. concert. Central.

WNAM, Lincoln, Neb. 100 ml. General Supply Co. Daily ex Sun, 2:15 pm, music, news. Mon, Thurs, 7:30 pm, music. Central.

WNAN, Kansas City, Mo. 485 also. 600 ml. Daily Drivers Telegram. Daily ex Sun, 8:15 am, 9:15, 10:15, 11:15, 12:15 pm, 2:15, weather, markets. Central.

WNAP, Lockport, N. Y. Norton Labs.

WNAL, Trenton, N. J. 100 ml. Trenton Hdwe. Co. Mon, Thurs, 7:30-9 pm, music, lecture. Eastern.

WNAM, Beaumont, Tex. Beaumont Radio Equipment Co.

WNAN, Columbus, O. 50 ml. First Baptist Church. Sun., 10:30-12 m., 7:30-9 pm, church services. Central.

WNAW, Easton, Pa. Utility Battery Service.

WNAQ, Chicago, Ill. 1500 ml. The Chicago Daily News (Fair Department Store). Daily, 4:35-5 pm, 9:15-10. Mon, Wed, Fri, Sat, 7-7:30 pm, Tues, Thurs, 7-8 pm. Central.

WNAR, Waterloo, Iowa. Waterloo Electrical Supply Co. Schedule not established.

WNAT, Duluth, Minn. 485 also. 2,400 ml. Paramount Radio Corp. (Duluth News-Tribune). Daily ex Sun, 11:20 am, 4:20 pm, markets, reports, 6:50-7:30, stocks. Tues, Fri, 8-9:30 pm, classical program. Central.

WNAX, Auburn, Ala. Ala. Polytechnic Inst.

WNAY, Wahpeton, N. D. 50 ml. Wahpeton Elec. Co. Daily, 7-7:30 pm, music, sports, news. Central.

WNBA, Ann Arbor, Mich. K. & K. Radio Supply Co.

WNBB, St. Louis, Mo. 1,000 ml. Kingshighway Presbyterian Church. Sun, 11 am, 8 pm. Tues, 7-8 pm, church services. Central.

WNBC, Macon, Ga. 250 ml. Mercer University. Daily ex Sun, 6:30-6 pm, 7-7:30, 8:30-9:30, music. Tues, Wed, Thurs, 10:30-11 am, chapel. Eastern.

WMB, Auburn, Me. Auburn Elec. Co.

WMC, Memphis, Tenn. 400 and 485 only. 2,000 ml. The Commercial Appeal. Daily, 12 m, 3 pm, weather, markets; 8 pm, entertainment. Central.

WMD, Cincinnati, O. 485 only. 500 ml. Precision Equipment Co. Daily ex Sun, 11 am, 4 pm, reports. Mon, Wed, Sat, 8:15 pm, entertainment. Central.

WMO, Washington, D. C. 100 ml. Doubleday-Hill Elec. Co. Daily, 4:30 pm, concert, sports. Thurs, 8-9 pm, concert. Eastern.

WNAB, Bowling Green, Ky. 500 ml. R. D. Nichols. Daily ex Tues, 4-5 pm, 7:30-9 pm, music. Central.

WNAC, Boston, Mass. 200 ml. Shepard Stores. Daily ex Sun, 4-5 pm, dance music. Tues, Thurs, 7-8:30 pm. Wed, Sat, 9:30-11 pm, Fri, 8-9:30 pm. Sun, 11-12 am, 6:30-8:30 pm, church services. Eastern.

WNAD, Norman, Okla. 200 ml. Okla. Radio Engineering Co. Daily ex Sun, 7:45-8:15 pm, news. Central.

WNAM, Enid, Okla. Enid Radio Dist. Co.

WNAN, Cresco, Ia. Rotherth Radio and Electric Shop.

WNAT, Wilkes-Barre, Pa. Wilkes-Barre Radio Repair Shop.

WNAX, Manhattan, Kans. Manhattan Radio Supply Co.

WNAL, Omaha, Neb. R. J. Rockwell.

WNAM, Evansville, Ind. 200 ml. 485 also. Ideal Apparatus Co. Inc. Mon, Wed, Fri, Sat, 10:11 am, music, reports; 3-4 pm, 7-8, entertainment. Sun, 3-4 pm, music. Central.

WNAN, Syracuse, N. Y. 1,000 ml. Syracuse Radio Tel. Co. Mon, Wed, Sat, 7:30-9:30 pm, concert, agriograms, etc. Eastern.

WNAP, Charleston, S. C. Charleston Radio Elec. Co.

WNAR, Springfield, O. 200 ml. Wittenberg College.

WNAS, Butler, Mo. C. C. Rhodes.

WNAT, Austin, Tex. Tex. Radio Corp. (Austin Statesman).

WNAT, Philadelphia, Pa. 500 ml. Lennig Bros. Co. Daily ex Sun, 12:15-1 pm, Wed, Sat, 7:30-9:30 pm, Sun, 2:30 pm, 4:30, church services. Eastern.

WNAW, Knoxville, Tenn. People's Tel. & Telg. Co.

WNAW, Fortress Monroe, Va. Henry Kunzmann.

WNAZ, Yankton, S. D. Dakota Radio Apparatus Co.

WNAZ, Baltimore, Md. Shipman Radio Service.

WNJ, Albany, N. Y. 50 ml. Shotton Radio Mfg. Co. Inc. Daily ex Sun, 10-10:15 am, market reports. Wed, 8:15 pm, concert. Eastern.

WNO, Jersey City, N. J. Wireless Telephone Co of Hudson Co., N. J.

WOAA, Ardmore, Okla. Dr. Walker Hardy.

WOAB, Grand Forks, N. Dak. 50 ml. 485 also. Valley Radio. Daily ex Sun, 10-11 am, 2-2:30 pm, entertainment, reports. Sun, 3-4 pm, music, church service. Central.

WOAC, Lima, O. Maus Radio Co.

WOAD, Sigourney, Ia. Friday Battery & Elec. Co.

WOAE, Fremont, Neb. Medland College.

WOAF, Tyler, Tex. 485 also. 50 ml. The Tyler Commercial College. Daily ex Sat & Sun, 12 m, weather, markets; 7 pm, weather, codes; 10:15, U. S. Navy press. Sun, 11 am, 7:30 pm, church service. Central.

WOAG, Belvidere, Ill. Apollo Theatre.

WOAH, Charleston, S. C. 200 ml. Palmetto Radio Corp. Mon, Thurs, Sat, Sun, 10 pm-1 am, music. Eastern.

WOAI, San Antonio, Tex. 485 also. 1,800 ml. Southern Equip. Co. Daily ex Sun, 10:30 am, 12:15 pm, Sun, 9:30-10:30 am, 7-8:30 pm, concert. Central.

WOAJ, Parsons, Kans. Ervin's Elec. Co.

WOAK, Frankfort, Ky. Collins Hardware Co.

WOAL, Webster Grove, Mo. William E. Woods.

WOAN, Lawrenceburg, Tenn. 1,000 ml. James D. Vaughan. Daily, 8-9 pm, concert. Central.

WOAO, Portsmouth, Va. Portsmouth Radio Assn.

WOAP, Kalamazoo, Mich. Kalamazoo College.

WOAR, Kenosha, Wis. H. P. Lundskow.

WOAS, Middletown, Conn. 100 ml. Bailey's Radio Shop. Daily ex Sun, 4:15-6 pm, music. Sat, 9-12 pm, dance music. Eastern.

WOAT, Wilmington, Del. Boyd Martell Hamp.

WOAV, Evansville, Ind. Sowder Bowling Piano Co.

WOAW, Erie, Pa. Penna. Nat'l Guard.

WOAX, Omaha, Neb. Woodmen of the World.

WOAZ, Trenton, N. J. 342 only. 300 ml. F. J. Wolff. Intermittent schedule.

WOAY, Birmingham, Ala. John M. Wilder.

WOAZ, Stanford, Tex. Penick Hughes Co.

WOC, Davenport, Ia. 400 and 485 only. 1,000 ml. Palmer School of Chiropractic. Daily ex Sun, 10:55 am, time; 11, weather; 12 m, chimes; 2 pm, markets; 3:30, talk; 5:45 chimes, ex Wed; 6:30, sports; 7, concert; 10 pm, concert, Wed only. Sun, 9 am, chimes; 1:45 pm, 6, concert; 7, church services; 7, concert. Central.

WOE, Akron, Ohio. 100 ml. Buckeye Radio Service Co. Mon, Wed, Fri, 7-8:15 pm, music, agriograms, sports. Sat, 8-4:30 pm, music, sports. Eastern.

WOH, Indianapolis, Ind. 1,000 ml. Hatfield Elec. Co. (Indianapolis Star). Daily ex Sun, 10-11 am, music; 10:15, financial, markets; 1-2 pm, music; 1:20, markets; 4-5 pm, music; 4:15, police notes; 4:50, sports. Mon, Wed, Sat, 8:30-10 pm, concert. Central.

WOI, Ames, Ia. 485 also. 200 ml. Iowa State College. Daily ex Sun, 9:30 am, 12:45 pm, 9:30, music, weather. Central.

WOK, Pine Bluff, Ark. 485 also. 500 ml. Ark. Light & Power Co. Tues, Fri, 9-10 pm, concert. Sun, 11-12 m, 7:30 pm, church services. Central.

WOQ, Philadelphia, Pa. 400 and 485 only. 500 ml. John Wanamaker.

WOQ, Kansas City, Mo. 485 also. 1,000 ml. Western Radio Co. Mon, Tues, Wed, Thurs, 9:45 am, 10:55, 11:30, 12:30 pm, 2, 7:30, time signals, reports, etc. Fri, 1:15 pm, sacred service. Sat, 8 pm, concert. Sun, 7 pm, concert.

WOR, Newark, N. J. 400 only. 2,000 ml. L. Bamberger & Co. Daily ex Sun, 2:30-4 pm, 6:15-7, music,

talks. Tues, Fri, 8-10, music, entertainment. Eastern.

WOS, Jefferson City, Mo. 485 also. 1,500 ml. Missouri State Marketing Bureau. Daily ex Sun, first 15 min. of every hour from 8 am-2 pm, markets. Daily, 5 pm, music, markets. Mon, Wed, Fri, 8-9:30 pm, concert. Central.

WOU, Omaha, Neb. Metropolitan Utilities Dist.

WOZ, Richmond, Ind. 485 also. 300 ml. Palladium Printing Co. Daily ex Sun, 12-12:25 pm, 4-5, 6:30-7, music, markets. Central.

WPA, Ft. Worth, Tex. 485 also. 1,000 ml. Fort Worth Record. Daily ex Sun, 10:55-11 am, time, 2:30-3 pm, 6-6:30, 8-9:30, Sun, 3-3:30 pm, 9-9:30. Mon, 11-12 mid. Central.

WPAA, Waco, Neb. Anderson & Webster Elec. Co.

WPAB, State College, Pa. Pa. State College.

WPAC, Okmulgee, Okla. Donaldson Radio Co.

WPAD, Chicago, Ill. 1,000 ml. W. A. Wieboldt & Co. Daily ex Sun, 12:30-1:30 pm, 6:30-7, music. Central.

WPAE, Council Bluffs, Ia. Peterson's Radio Co.

WPAF, Independence, Mo. Central Radio Co., Inc.

WPAH, Waupaca, Wis. Wisconsin Dept. of Markets.

WPAJ, New Haven, Conn. Doolittle Radio Corp.

WPAK, Fargo, N. D. North Dakota Agricultural College.

WPAL, Columbus, O. Superior Radio & Tel. Equip. Co.

WPAM, Topeka, Kans. Averbach & Guettel.

WPAN, Winchester, Ky. Theodore D. Phillips.

WPAQ, Frostburg, Md. General Sales & Engineering Co.

WPAR, Beloit, Kan. 50 ml. R. A. Ward. No definite schedule.

WPAS, Amsterdam, N. Y. J. & M. Electric Co.

WPAT, El Paso, Tex. Saint Patrick's Cathedral.

WPAU, Moorhead, Minn. Concordia College.

WPAV, Laurium, Mich. Tinetti & Sons.

WPAX, Wilmington, Del. Radio Installation Co., Inc.

WPAY, Thomasville, Ga. 25 ml. S-V Radio Co. Daily ex Sun, 5-6 pm roads, weather, stocks, music. Mon, Wed, Fri, 8:30-9:30 pm, music. Sat, 10-11 am, codes. Sun, 11:30 am-12:30, 8:30 pm-9:30, church service. Eastern.

WPB, Bangor, Me. Bangor Radio Lab.

WPE, Kansas City, Mo. 300 ml. Central Radio Co. Sun, 6-7 pm, church services. Central.

WPG, New Lebanon, O. 485 also. 1,500 ml. Nushawg Poultry Farm. Daily ex Sun, 12-12:15 pm, news, 6-6:30 pm, markets Mon, Fri, 8-9:45 pm, music, farm program. Central.

WPI, Clearfield, Pa. Elec. Supply Co.

WPM, Washington, D. C. 200 ml. Thos. J. Williams, Inc. (Washington Daily News). Daily ex Sun, 12:30 pm, news. Mon, 8 pm, concert. Eastern.

(Continued on page 9)

The "How" of the Simplified Super Circuit

Part II—Details Regarding the Component Parts

By E. T. Flewelling

Exclusive—

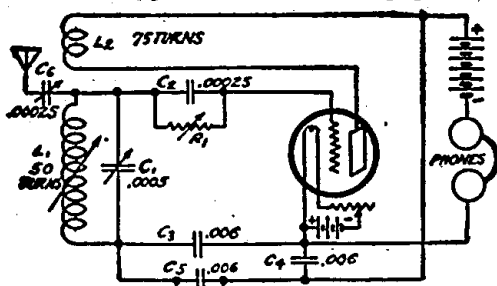
WHEN E. T. Flewelling and his set "that made good in a day" were discovered by Radio Digest, the flivver circuit was practically unknown. Its appearance in the Digest is another scoop. Mr. Flewelling has agreed to write exclusively for Radio Digest. The article on this page is one of a series to appear every week which will help the Radiophan in the perfecting of his own flivver set.

WHEN information concerning the Flewelling circuit was first published it was believed to be best to specify only one particular way in which the circuit could be set up, that is only one list of materials needed was given. This was done in order to simplify matters and to avoid the confusion that might arise if various coils, etc., were mentioned, and because it was known that if the specifications were rigidly followed the experimenter was practically assured of success. Our letters have shown us that a great many are endeavoring to make their own loops, coils and other parts used.

There is considerably more interest for some in constructing their own parts and it will doubtless be of value if some details are given about the component parts of the hook-up.

Use of Spider Web Coils
The variocoupler that would be suitable for use in the Simplified Super was covered in the last article. Instead of a variocoupler or Giblin Remler coils one might prefer to use spider web or other coils. Spider web coils are very efficient and flexible so far as coupling is preferred. To make suitable spider webs for broadcasting reception, that is 325 to 500 meters, procure some discs about 1/16 inch thick of bakelite, cardboard or celluloid. These discs are to be 4 inches in diameter and are slotted to within 3/4 inch of the center by 9 slots. The primary inductance L1 should be wound with No. 26 double cotton covered wire to 32 turns and the tickler coil L2 should be wound to 45 turns. It will be hard to get 45 turns of No. 26 wire into the space given so that it will be found preferable to use 30 or 32 wire for the tickler.

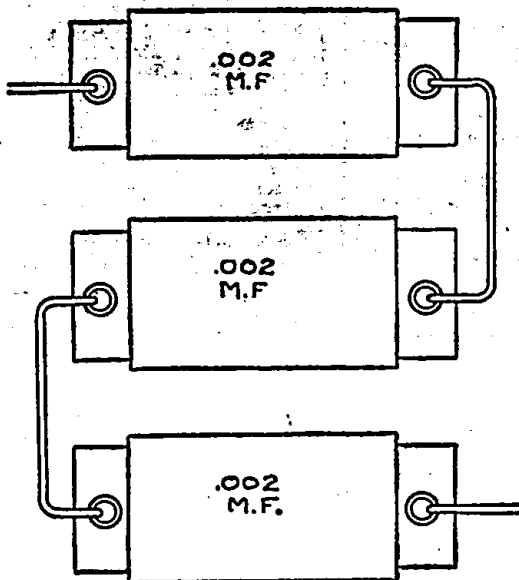
Single Layer Coil
Another type of coil that is popular is



Flewelling Super Circuit

the single layer coil wound on cardboard or bakelite tubing, and if the experimenter prefers this type, suitable coils may be made by using a 4-inch tube with 30 turns for the inductance L1 and 45 turns for the tickler L2, and as in the case of all other types of coils, mounting them so that the inductive relationship or distance from

each other may be varied to meet the requirements called for in tuning in a station.



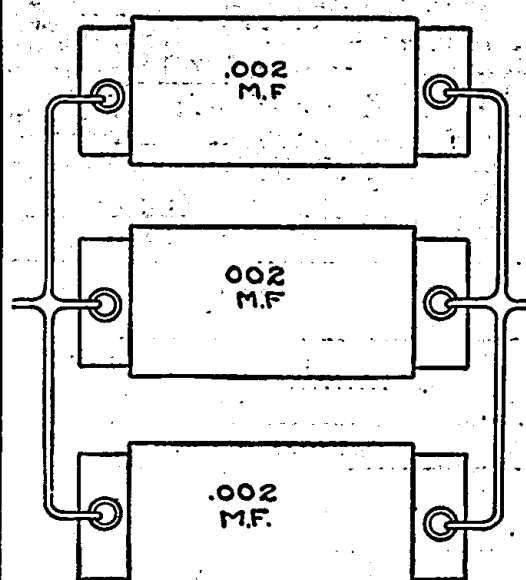
Improper method of connecting three .002 M. F. fixed condensers together to secure a capacity of .006 M. F. This arrangement is known as "series" and the capacity value of the whole is only .00067 M. F. See the correct method and note the difference

This brings us to a point that can hardly be overemphasized. The Super circuit is a very critical tuner and it is known that one of the easiest things to do when searching for a station is to jump right over it without knowing that it is there. When using a standard set equipped with a common three-plate vernier condenser, it has been noted at various times that up to four different broadcasters have been picked up within the range of the vernier alone. It is therefore of the utmost importance, especially for long distance reception, to have all parts move as smoothly as possible so that they may be moved very slowly and evenly, in this way covering every point in their range.

Condensers to Use

For the tuning condenser C1 most any make can be used, and as with anything else, some are preferable to others. Which-ever type is used be sure that a vernier is also used. It is best to use a condenser of .0005 MF capacity for broadcasting because if a larger one is used, stations will be jumped over, due to difficulty in moving the condenser without making a comparatively great change in capacity. On

the other hand, if a smaller condenser is used, say an eleven-plate, the set will be too much of the hair trigger variety.



Correct method of connecting three .002 M. F. condensers in series in order to secure a capacity of .006 M. F. This arrangement is known as "multiple" or "parallel" and the capacity of the whole is the sum of the capacities in parallel, or, in this case, .006 M. F. The open ends are for connection into the circuit

Body Capacity Effects

The matter of body capacity effects with this set will have to be treated at length later on, but this much can be said while we are on the subject of the phones. Remembering that the phones are not a part of the supposedly low frequency oscillation circuit we find that this effect should not be, comparatively speaking, any greater than with an ordinary receiver. That it is, is due to fact that the Super is so much more sensitive and acts here just

(Continued on page 13)

STATION SCHEDULES

(Continued from page 8)

- WFO, Memphis, Tenn. 100 mi. United Equip. Co. Daily, 7:15-8:15 pm, music. Central.
- WQAA, Parkersburg, Pa. 1,500 mi. Horace A. Beale, Jr. Daily, 10:30 pm, Eastern.
- WQAB, Springfield, Mo. Southwest Missouri State Teachers College.
- WQAC, Amarillo, Tex. E. B. Glsh.
- WQAD, Waterbury, Conn. Whitall Elect. Co.
- WQAF, Sandusky, O. Sandusky Register.
- WQAH, Lexington, Ky. Brock-Anderson Elect. Eng. Co.
- WQAJ, Ann Arbor, Mich. Ann Arbor Times News.
- WQAK, Dubuque, Ia. Appel-Higley Elec. Co.
- WQAL, Annetoon, Ill. Cole County Tel. & Tel. Co.
- WQAM, Miami, Fla. Electrical Equipment Co.
- WQAP, Lincoln, Neb. Am. Radio Co.
- WQAO, Abilene, Tex. West Tex. Radio Co.
- WQAA, Houston, Tex. Rice Institute.
- WRAC, Mayville, N. D. State Normal School.
- WRAD, Marion, Kans. Taylor Radio Shop.
- WRAM, Galesburg, Ill. Lombard College.
- WRAN, Waterloo, Ia. 100 mi. Black Hawk Electrical Co. Daily ex Sun, 5 pm, 5:30, concert, news. Mon, Wed, Fri, 8:30-9:15 pm, concert. Sun, 11:15, church services. Central.
- WRAR, David City, Neb. Jacob Carl Thomas.
- WRAS, Amarillo, Tex. Daily News.
- WRAY, Scranton, Pa. 485 also, 100 mi. Radio Sales Corp. Daily ex Sun, 11 am, music; 12 m, reports; 3:30-5:30 pm, reports, music; 7:30, bedtime stories, music. Sun, 3 pm, chapel. Eastern.
- WRK, Hamilton, O. 1,000 mi. Doron Bros. Elec. Co. Tues, Thur, 9-10:30 pm, music, lecture. Sun, 10:30 am, church service. Central.
- WRL, Schenectady, N. Y. Union College Radio Club.
- WRM, Urbana, Ill. 300 mi. Univ. of Ill. Mon, Thur, 8:30-8:50 pm, 9-9:30 news, talks, music. Central.
- WRP, Camden, N. J. 250 mi. Federal Inst. of Radio Tel. Daily ex Sat, Sun, 10-10:45 pm, music, news, ariograms. Eastern.
- WRR, Dallas, Tex. 485 also, 200 mi. City of Dallas. Daily ex Sun, 12-12:30 pm, weather; 3-3:30, sports, markets, news; 7-7:15, police news; 8-8:30, music. Sun, 11 am, church service; 7-8 pm, police news, church service. Central.
- WRW, Tarrytown, N. Y. 1,000 mi. Tarrytown Radio & Research Laboratory. Daily ex Sun, 10:30-12 m, Mon, Thur, Sat, 6:15-7 pm, 7:30-8:30, 10:30-12 pm, Sun, 1-3 pm, Eastern.
- WSAJ, Grove City, Pa. Grove City College.
- WSAB, Cape Girardeau, Mo. Southeast Mo. State Teachers College.
- WSAS, Lincoln, Neb. 485 also, 700 mi. Nebr. Dept. of Agri. Daily ex Sat pm and Sun, 9:30 am, 9:45, 10, 10:30, 10:45, 11, 11:30, 11:40, 11:50, 12 m, 1:15 pm, 1:30, 1:45, reports.
- WSAV, Houston, Tex. 300 mi. Clifford W. Vick, Radio Const'n Co. Mon, 8-10 pm, concerts. Daily, 7:15-8 pm, Central.
- WSB, Atlanta, Ga. 400 and 485 only, 1,500 mi. Atlanta Journal. Daily ex Sun, 12-1 pm, music; 2:30, reports; 4-4:45 pm, music, reports; 5-6 pm, 7-8, 10:45-12 music. Sun, 10:45 am, 5-6 pm, 7:30-9, church services. Central.
- WSL, Utica, N. Y. 500 mi. J. & M. Elec. Co. Daily ex Sat, Sun, 11-11:30 am, 2-2:30 pm, 3-3:30, 4-4:30, 5-5:30, music, news. Mon, Wed, 8-9 pm, Sat, 11-11:30 am, 5-6 pm, 8-9. Sun, 10:30-12 m, 7:30-9 pm, Eastern.

- WSY, Birmingham, Ala. 2,000 mi. Alabama Power Co. Mon, Wed, Fri, 3-3:30 pm, 8-8:45, reports, concert. Sun, 11 am, 7:30 pm, church services. Central.
- WTAC, Johnston, Pa. Penn Traffic Co.
- WTAU, Tecumseh, Neb. Ruegy Battery & Elec. Co.
- WTAW, Colago Station, Tex. Agricultural and Mechanical College of Tex.
- WTG, Manhattan, Kan. 485 only, 75 mi. Kan. State Agri. College. Daily ex Sun, 9:55 am, weather (code). Central.
- WTP, Bay City, Mich. 75 mi. Ra-Do Corp. Mon, Wed, 1:30-2 pm, reports, news; 6:30-7:30 pm, concert. Central.
- WWAC, Aco, Tex. 485 also, 200 mi. Sanger Bros. Daily ex Sun, 10 am, weather, 1:30 pm, music. Mon, Wed, Fri, 8:45 pm, music. Central.
- WWAD, Philadelphia, Pa. Wright & Wright, Inc.
- WWAX, Laredo, Tex. 150 mi. Worms Bros. Daily ex Sun, 4:30-5:30 pm, music. Mon, Sat, 8-9 pm, music. Central.
- WWB, Canton, O. Daily News Printing Co.
- WWI, Dearborn, Mich. 200 mi. Ford Motor Co. Wed, 10-11 pm, music, lectures. Eastern.
- WWJ, Detroit, Mich. 400 and 485 only, 1,500 mi. Evening News. Daily ex Sun, 9:30-9:40 am, household hints; 9:40-10:25, health talks; 10:25-10:30 am, weather; 11:55-12 m, time; 12:05-12:45 pm, music; 3-3:30 music; 3:30-3:35, weather; 3:35-4:15, markets; 5-6, sports; 7:30-10, entertainment. Sun, November 11, and every other week, 11 am, 4 pm, church services. Sun, all in weeks, 2 pm, 7:30, church services, special. Eastern.
- WWL, New Orleans, La. Loyola Univ.
- WWT, Buffalo, N. Y. 200 mi. McCarthy Bros. & Ford. Daily 3-4:30 pm, 7:30-9:30. Eastern.
- WWX, Washington, D. C. 1,160 only, 600 mi. Post Office Dept. Daily ex Sun, 10 am, weather; 10:30, markets, 12:30, 2:15, 3:30, markets, 5 pm, 7:30, markets; 9:45, weather. Eastern.
- WWZ, New York City, 200 mi. John Wanamaker. Daily ex Sun, 1:15-2:15 pm, Tues, 7:30-9 pm, Fri, 7:30-8:30 pm, Eastern.

(Note.—This completes the station schedule list. The first part will appear again next week.)

C R L
VAR. GRID LEAK
1/4 to 10 megohms
KLENTZ RADIO CO.
Exclusive Distributors
508 South Dearborn St.
Room 770 Wabash 1380
Chicago

PRICE ONLY \$2.50

Your Set Deserves One



180° COUPLER

Affords a Guaranteed Range of 600 Meters. Mechanically Perfect, Complete with Soldered Leads, Positive Pigtail Connections. Genuine Bakelite Tubing and Fahnestock Clips.

At your dealers—otherwise send purchase price and the Coupler will be sent without further charge.

G. H. FISCHER & CO.
317 Cypress Hills Road GLENDALE, L. I., N. Y.

WE ALSO MANUFACTURE
LARGE AND SMALL
VARIOMETERS AND
VARIOCOUPERS
WRITE FOR CATALOGUE

FLEWELLING
ALL PARTS NECESSARY
DEALERS: WRITE FOR DISCOUNTS
HUDSON-ROSS
123 W. Madison St. Chicago

GOV'T. RADIO STORAGE BATTERIES

All absolutely new Signal Corps Batteries. Edison 3 cell type 1B-1 \$4.50; Willard 4 cell type SYR-13 \$4.25; Willard 2 volt 40 A. H. for WD-11 tubes \$4.75; 6 volts Edison \$7.75; Edison B Battery elements 4c each.

FLEWELLING .006 CONDENSERS
Bakelite mounted with binding posts. Set of three \$2.90.

FLEWELLING SPIDER WEB COILS
Easier tuning; clearer signals; Green silk wound \$1.75 ea.

FLEWELLING VARIABLE GRID LEAKS
Give clearer music, louder signals on any circuit, 75c.

REINARTZ LATEST SPIDER WEB COILS
Double green silk winding on Bakelite spider \$1.95.

VERNIER FOR VARIABLE CONDENSER
Fits any condenser. Requires no extra space, 95c.

HI-POWER AMPLIFYING TRANSFORMERS
Best made. Louder signals. Cannot burn out. \$2.95. Call Book of all Canadian Stations, \$1.25. 5000 Meter long wave couplers, \$7.95.

We save you money. Tell us what you need.
QUALITY RADIO SHOP, RICHMOND, IND.

How to Make a Flewelling Receiver



COMPLETE Blue Prints
for the construction of a Flewelling Receiving Unit and two step amplifier.

Instructions for Assembly
Description of apparatus and accessories and details of tuning.

**CABINET DIMENSIONS
PANEL LAYOUTS
LIST OF PARTS**

Send only money orders—no checks or stamps. Coins at your own risk.

Book Department
Radio Digest
123 W. Madison Street, Chicago, Ill.

Only 50¢

Radio Digest Illustrated

REG. U. S. PAT. OFF.

Published by the Radio Digest Publishing Company, Inc.
123 West Madison Street
Telephone State 4844-4845
Chicago, Illinois

E. C. RAYNER, Publisher
Chas. F. Smisor, Editor Evans E. Plummer, Managing Editor
Harry J. Marx, Technical Editor

Eastern Representative, Jacob Miller, 2126 Broadway, New York
Telephone Columbus 2390

Pacific Coast Representatives
E. J. Wood, 251 Kearny St., San Francisco
Telephone Kearny 1472
H. M. Morris, 417 Western Mutual Life Building, Los Angeles
Telephone 12011

58
PUBLISHED WEEKLY

SUBSCRIPTION RATES
Yearly.....\$5.00 | Foreign.....\$6.00
Single Copies, 10 Cents

Vol. IV Chicago, Saturday, February 10, 1923 No. 5

White Radio Bill

Early Consideration Vital to Development of Radio
AFTER a thorough study of the White Radio bill, the House Committee recommends its early consideration since it carries only proposals vital to Radio development at this time. The approaching end of the session is pointed out with the imperative need for conferring regulatory powers upon the Department of Commerce.

Little opposition is anticipated, and yet, some point out, helpful legislation has been lost heretofore through lack of public interest. If the Radio operators and fans want the White bill passed this session, they must assert themselves, indicating their desires to their representatives in Congress. This is the opinion of many who seek legislation.

If the bill is not passed this session, they say, new measures will have to be introduced in the next session of Congress, which does not organize until next December. Many believe a long delay would be most unfortunate for a national service which is fast developing in its many useful phases.

Those Who Transmit

Where Some Interference Comes from and Why
NATURALLY everyone is acquainted with the fact that no charge is made by the government for the privilege of operating a receiving station. The same, of course, is true of the transmitter. Outside of the small notary fee, there is no charge for an amateur's license or, in fact, any license.

Today, aside from the high power government stations there are thousands of so-called Radio amateurs in the country possessing the authority and knowledge of operating a transmitting station. The transmission is sent out in code and phone, although the former predominates. The licensing, it is agreed, has been somewhat indiscriminate and quite a few operate stations who in reality are not capable. In this lies a source of interference which, it is hoped, will be shortly cleared by better Radio legislation.

Natives of Jungles Broadcast

Before Radio the Natives Had Their Own Way to Send Messages

OUR best Radio sets seem to be back numbers when we learn that in the darkest Africa the bush "Radio" has been in use many years by the natives. Our invention may be wonderful wherein advancing knowledge has made broadcasting possible. Every traveler in savage Africa has had evidence of the almost incredible swiftness with which the native can communicate with distant friends. The bush "Radio" operates even more speedily than our telegraph.

The exact means employed varies with the tribe and circumstances. Drum-beats are the usual signals; smoke is often used, and in some parts of the Gold Coast even whistling is enlisted for the conveyance of news. More mysterious is the so-called veldt or bush "telegraph," a phenomenon which wise Europeans do not attempt to explain.

Bush villages can call up one another very much as if they were on the telephone. Each has its collection of signal drums, used for different purposes, and by them the chiefs can tell each other that there is a man-eating lion on the prowl, that the native commissioner has started his tax gathering tour, or that there will be a big beer-drink at such and such a village on the night of the full moon.

The European who has lived long in the bush and who hears the sound of far-away drums knows well that to him unintelligible beats are far from meaningless for the natives.

At the outbreak of the world war in 1914 a party of explorers was located quite a number of miles from a telegraph station in Africa. When the operator at the telegraph station learned of it he sent a messenger on a bicycle to bring the news. He need not have troubled. Four hours before the telegraph clerk arrived one of the plantation overseers had asked the head of the party mysteriously why the white men in Europe were at war. It was the first intimation that the exploring party had that hostilities were started. The bush "telegraph" had beaten the wire lines and messenger.

Condensed

By DIELECTRIC

A short time ago the news of having talked to England from a broadcasting station in this country would have elicited considerable excitement. The feat accomplished by officials of the American Telephone and Telegraph Company when their speeches were clearly heard in a receiving set in Southgate, England, affects us only slightly, in comparison to the significance of the thing. We are told that it may be months—years, before the arrival of such time as will find Radiophony used internationally on a commercial basis. That may be. It may also prove true that in a much shorter time business will be utilizing this medium. It would be unwise to make a prediction in this age of sudden discoveries. England is preparing to talk back to us and when she does there may be something said by Yankee listeners about the English accent, by jove! Keep your directional loop aimed toward Senator Marconi or you may miss something. He is working, too, on an important phase of Radio.

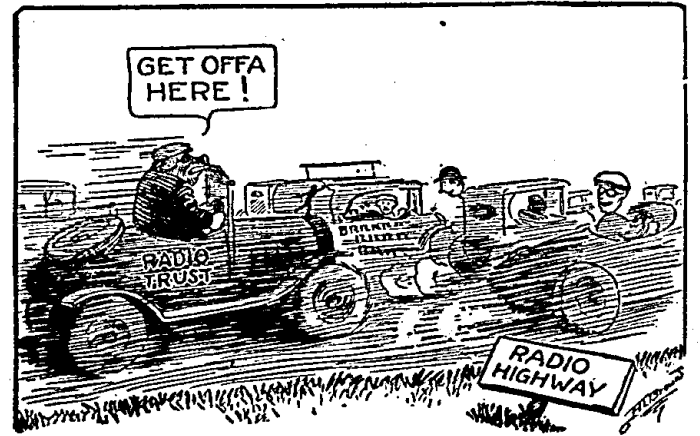
Before swinging away from the British Isles let me call attention to plans, which are now maturing, for the construction of a system over there to allow the sending of messages from England to Australia at a cost of two cents a word. They are awaking to a realization of the necessity of meeting needs in conformity with modern practices. There is no advantage in discussing whether or not Radio is to supplant the more common methods of communication between states and nations, enough that it is to fill an important place in this realm of everyday experience. Pity the country whose lack of vision is responsible for its tardiness in developing this new science and keeping abreast of the times. As in every other field of world progress, it is necessary to adjust oneself to changing conditions and accept whatever tends to advancement. Where outworn usages hinder, remove them, and let every government aid its amateurs to a freer use of whatever ability they possess.

Prizes are being offered by some of the broadcasting stations to the one who hears their programs from the most distant point. An offer of this kind was made by Station WNAC in Boston. DX owls have been indulging in the pastime of picking up remote stations for a long time, and will continue to do so. The number of such patient ones will be rapidly increased, I fancy, if success is to bring some more or less valuable gift. The notion of possessing one of those large boxes of candy offered by WDAP still lingers as a taunting memory. And, just think of winning a WDAP Flivver. That would be rattling good, wouldn't it?

The extent to which code messages may be heard by stations far removed from each other is gradually assuming proportions which Radiotricians prophesied would come eventually. A ship copied code from four Atlantic amateur stations when one hundred and twenty miles off the coast of China. That speaks well for our amateurs. Still more recently a message from Japan was received in its entirety by the receiving operator of The New York Times, a distance of nine thousand miles. If you live long enough, you will look back on these records as commonplace in view of what will then be possible.

Perhaps one of the most enjoyable, and at the same time, profitable, features of a broadcasting program is to be able to listen in to some after dinner speeches by men who are eminent in their particular line. It has been possible to hear railway officials, public officials, university presidents at alumni reunions, leaders in the automotive industry and many others address audiences in banquetting halls through a receiving set in your home. Except for the kindly offices of broadcasting stations this would be impossible for most of us. I happen to know one case of biliousness that was dissipated with Coueism magic, simply by placing the patient where he could hear the hearty laughter which followed witty remarks by Big Bill Edwards at a meeting of college athletic directors. Impressions of prominent men are often found to be erroneous when the microphone transmits side remarks made by them while seated at the speakers' table in the dining hall of a hotel. Mr. Schwab was thus truly revealed to an acquaintance, unmindful perhaps that what those present could not hear was entirely audible in a headset.

No, I have not overlooked the mention of "silent periods". It seems rather a hopeless task to secure the attention of some powerful stations to this subject. If each of you fans will keep a fairly steady flow of letters directed to your local stations asking for this service, we will secure their attention ultimately. Opportunities to hear distant stations without interference from local broadcasters are becoming more general, but there is plenty of room for improvement. Without doubt instances of silent periods obtain about which I know nothing and failure to mention them is not due to intentional neglect. Where specific mention is made it is for the purpose of presenting an example, as much so as for congratulating them on their good judgment. Two instances will be cited of cordial cooperation along this line. WGY signed off for a period lasting over an hour in order that WHAZ might broadcast without interference from them. On another evening WEAJ transmitted its entire program over a special wire to WNAC, where it was broadcast to the Radio audience of the latter station. Pacific Coast stations are observing periods of silence to the great joy of Radiophans in that section of the country. Don't fail to express your appreciation where stations follow this regime. They deserve it.



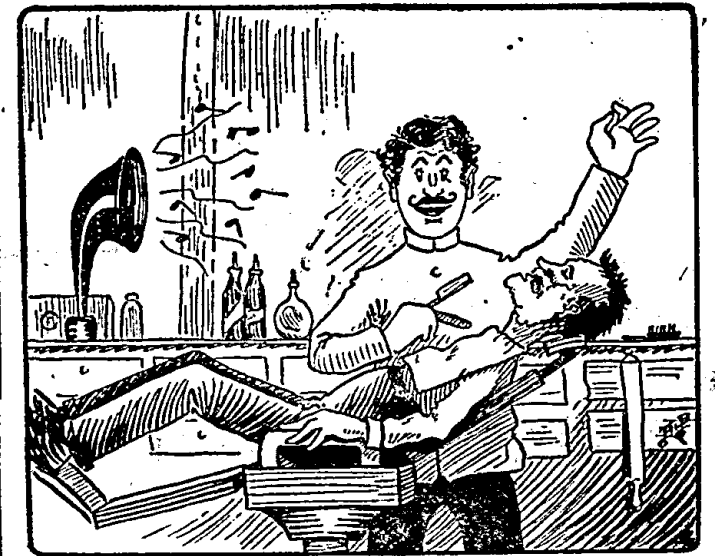
RADIO INDI-GEST

Tony, the Barber, on "Da Rad-I-O-U"

By EDWARD CALLOW

Hello Peepla!!!
Deesa time I speaka to you about won greata machine. It is calla Rad-I-O-U.
Grabba da speecha—da song from da fresh air.
De Rad-I-O-U was firsta invent by greata Italian man—Signor Marconi.
Wan million peepla try to improva da work of Signor Marconi.

I buy Rad-I-O-U for da shop—pay fiva dol' down—feefta centa week.
Gatta da louda speak for da shop—use—a da softa speak for da wife.
Da customer in barber shop talka too much—da barb no can do da work.
Da Rad-I-O-U maka da customer leesen in—no speaka out.
Da barb now can make da clean shave—no cutta da car—da chin—da lip.

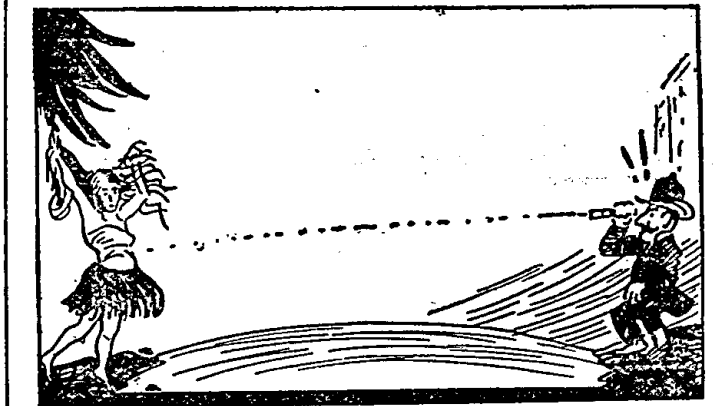


Herba Da Hoove mak' greata mistak—he try to gat congressaman to passa da bill to controlla da wave. We tal Herba Da Hoove to lay offa Rad-I-O-U wave control.
Coma to barber shop gat nice—a marcella wave on da dome.
Resta da hand an feet—hear Congressaman broadcuss hot air into da fresh air.
Yours vera true, for Rad-I-O-U,
Tony the Barber.

Not Always the Shape

Dear Indi—
Last nite and the nite before, twenty-four stations were at my door. Turned on the juice and let them in. Darned good set for the shape it's in.
—Jay Pee.

Ukeleles out; Radiophones in



A recent heading reads, "Hawaii dances to Seattle's music." A few years ago we were all dancing to Hawaii's music.

Old Gal-Lena Would Detect It

They were trying to improve reception on a crystal set.
"Shall I tickle the old gal-Lena?"
"You might try it, old top, if she'll let you."

Just a Good Variety of Jazz

The broadcast program was being received on a loud speaker. "My, but that static is awful tonight, isn't it?"
"Static nothing! That's a jazz orchestra!"

A. B. C. Lessons for Radio Beginners

By Arthur G. Mohaupt

CHAPTER VI

IN THE previous chapter we were told about the Radio receiving station, how it consists of an antenna for intercepting the Radio waves as they pass through space, a device known as the tuner by means of which the station can be adjusted or tuned to the desired wave length, and a detector by means of which the incoming Radio frequency oscillations are ren-

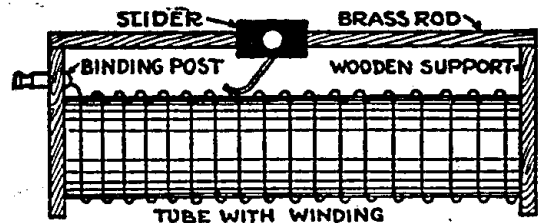


Figure 19

dered capable of affecting the human ear after they have been passed through a pair of telephone receivers. In this chapter we will interest ourselves with the process of tuning, as well as with the construction and operation of their various devices by means of which tuning is effected.

Tuning the Radio Station

Every antenna together with its lead-in and ground wire has its own natural oscillation frequency. In other words, every antenna system will respond more readily to an incoming wave of a certain length than to waves of other lengths. This natural wave length of an antenna depends upon the length of wire used and the height of the antenna above the ground. The longer the antenna or the higher it is elevated above the ground, the longer will be the natural wave length. It is evident, then, that an antenna system could be adjusted to any desired wave length by altering the length of the wire used, or by changing the height above the ground. But since either of these methods is generally not very convenient, it is common practice to add to the receiving apparatus an arrangement of coils and condensers by means of which the same effects can be produced as by altering the dimensions of the antenna.

If the natural wave length of an an-

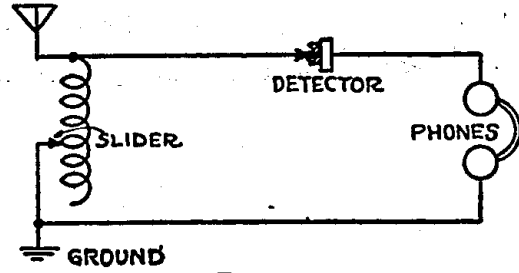


Figure 20

tenna system is less than the length of the desired incoming waves, the receiving station can be adjusted to the desired wave length by introducing additional inductance into the system. This is accomplished by means of some form of inductance coil connected in series with the antenna system. Such a "tuning coil" may be in the form of a one or two-slide tuner, a loose coupler, a variocoupler, or a variometer.

Single-Slide Tuning Coil

A single-slide tuning coil, as is illustrated in Figure 19, consists of a coil of wire wound in a single layer around a cardboard or fiber tube about four inches in diameter. The coil consists of about 150 turns of No. 23 or 24 insulated wire, cotton or enamel insulation being satisfactory. By means of the slider any number of turns can be cut into the circuit, and hence any desired amount of inductance can be obtained from maximum value of the coil to minimum. A wiring diagram illustrating how a one-slide tuning coil is connected into a receiving station is illustrated in Figure 20. As shown, the antenna is connected to the binding post leading to one end of the coil, while the ground wire, as well as the other wire leading to the phones is connected

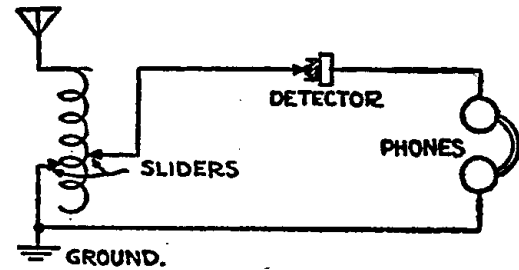


Figure 21

to the slider. By moving the slider back and forth the necessary amount of inductance can thus be introduced into the antenna circuit until the station is tuned to the desired wave length.

Two-Slide Tuning Coil

A two-slide tuning coil is similar in construction to the single-slide coil except, as its name suggests, it is provided with two sliding contacts. A common circuit used for connecting a two-slide tuner into a receiving station is illustrated in Figure 21. As shown, the antenna is connected

to one end of the coil, the wire leading to the detector is connected to one slider and the wire leading to the ground is connected to the other slider.

By moving the ground-connection slider back and forth the antenna system is adjusted to the wave length of the incoming signals, while by adjusting the other slider the detector circuit is thrown into resonance with the antenna circuit. The two-slide coil has the advantage in that it makes possible closer and sharper tuning. By closer tuning is meant the ability to tune in one station more accurately and to exclude all others.

Loose Coupler

A loose coupler is illustrated in Figure 22. The term coupler suggests that there are two inductively related or coupled coils. The loose coupler, as shown, consists of two coils, a primary and a secondary. The outer or primary coil, consists of a number of turns of wire wound on an insulating tube. It is also provided with a slider by means of which any number of turns can be cut in or out of the circuit.

Sliding in and out of the primary is the secondary coil which also consists

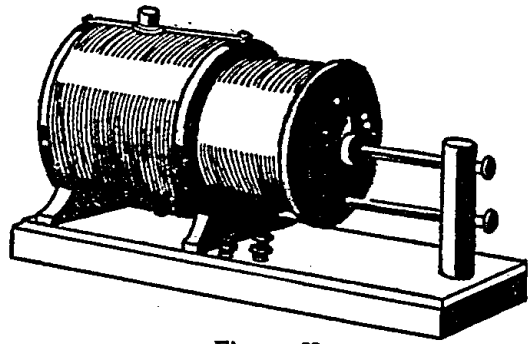


Figure 22

of a number of turns of wire wound on an insulating tube slightly smaller in diameter than the one used for the primary. The antenna is connected to one end of the primary coil, and the ground is connected to the slider. By adjusting the slider, the necessary number of turns can be introduced into the antenna circuit, so that it will have the correct natural wave length to receive the desired signals.

Across the terminals of the secondary coil is connected the detector circuit. The incoming oscillations in flowing through the stationary or primary coil set up around it a pulsating magnetic field which induces a current of corresponding nature and frequency in the secondary coil. The amount of this inductive influence upon the secondary can be altered by adjusting the position of the coil. The signals will be heard loudest in the telephone receivers when the secondary or detector circuit is in resonance with the primary circuit.

Variocoupler

Another form of tuning device used is the variocoupler. This, like the loose coupler, also consists of two coils, a pri-

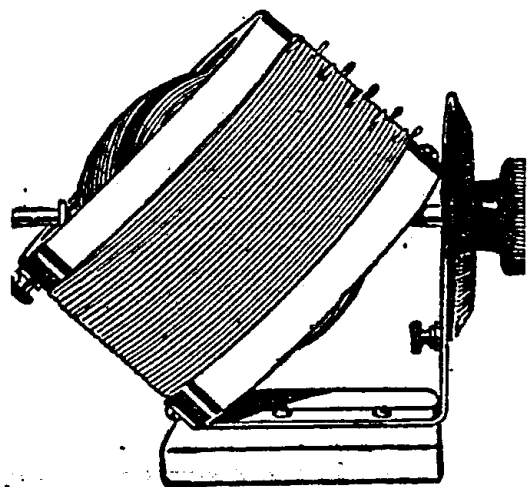


Figure 23

mary and a secondary, but differs in that the secondary rotates within the primary. The variocoupler is somewhat more efficient than the loose coupler and has the additional advantage that it can be conveniently mounted on a panel.

As illustrated in Figure 23, it consists of a primary coil with a number of taps brought out, by means of which the necessary number of turns can be cut in or out of the circuit. These taps are electrically connected to a number of switch points mounted on the panel and over which a rotating switch lever moves. The secondary consists of a number of turns of wire wound on an insulating tube somewhat smaller in diameter than that used for the primary.

The secondary is mounted on a rotating shaft which extends through the front of the panel and by means of which the secondary can be adjusted to any degree of inductive coupling desired. On the end of the shaft, projecting through the front of the panel a graduated dial can be mounted so that the position of the second-

ary can readily be observed. The antenna is connected to the end or first tap of the primary coil, while the ground connection is made to the shaft of the rotating switch, which moves over the contact points to which the taps of the primary are connected. The detector circuit is connected across the secondary or rotor of the coupler.

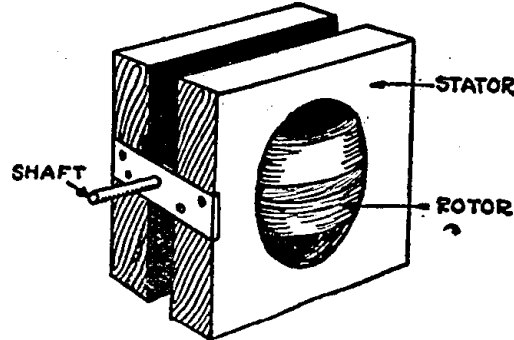


Figure 24

To operate a variocoupler, the antenna is first tuned to the desired wave length by adjusting the rotating switch, and after this has been done the secondary circuit is thrown into resonance with the primary until the signals can be heard loudest in the telephone receivers. In the coupler illustrated in Figure 23, the secondary is mounted at an angle of 45 degrees with the rotating shaft. The advantage of this construction is that it enables the rotor to be adjusted through a greater range of coupling.

Variometer

The variometer is another type of variable inductance. The variometer, like the variocoupler, consists of two coils, a stator or primary coil and a rotor or secondary coil. It differs from the variocoupler, however, in that there are no taps brought out on the primary coil and no variation in the length or amount of wire used is made.

In a variometer the two coils, that is, the primary and secondary, are connected in series and the amount of inductance of the two windings is varied by changing the position of the secondary with respect to the primary. When the rotor and stator are in such a position that their mag-

netic fields act in the same direction the inductance of the variometer will be a maximum; while if the rotor is turned through an angle of 180 degrees to this position the two magnetic fields will oppose each other and the inductance will then be a minimum. By setting the rotor at any intermediate position any desired amount of inductance can be secured.

The common type of variometer used in Radio receiving apparatus has the stator coil wound in two sections on the inner surface of two wooden blocks which are turned out to form a hollow sphere. The rotor coil is wound on a wooden ball which is mounted on a shaft and which rotates within the stator coil with a minimum amount of clearance between the two. Such a form of variometer is illustrated in Figure 24.

In another type of variometer, the supports for the stator and rotor coils are made of bakelite or some other insulating compound. Such variometers are called moulded variometers and are somewhat neater in appearance, although there is still a question as to whether their operation is better than, or even as good as the operation of the wooden type.

Receiving Circuit

In Figure 25, is illustrated a very efficient receiving circuit employing a vario-

(Continued on page 12)

NOVO B BATTERIES

NOTE THE INSULATED BINDING POSTS AND 7/16" WIRE CONNECTOR

NOVO MFG. CO.
424 W. 33rd ST. NEW YORK 531 SO. DEARBORN ST. CHICAGO

Wessco

W. E. SUPPLY AND SERVICE CORPORATION
18 MURRAY STREET, New York
2 Blocks South of Chambers, between Broadway and Church St.

OUR PRICES SPEAK LOUDER THAN WORDS

FREE FREE FREE
WITH EVERY \$10.00 AND OVER PURCHASE A \$1.50 22½-VOLT VARIABLE B BATTERY

Mail orders must include postage. TERMS:—Money Orders with Orders—checks not accepted. All Merchandise offered is Standard, Guaranteed, and is of perfect workmanship.

\$20.00 WESSCO BATTERY CHARGER DE LUXE

Equipped with a doubly durable vibrator which can be removed in less than a minute without the use of tools. Special rubber treads and various other im-

provements. Adapted for the recharging of radio A and B batteries and automobile storage batteries at the special introductory price of \$12.95

SOCKETS:	PANELS:
\$1.00 Genuine Bakelite Socket..... \$ 0.45	Guaranteed Genuine Bakelite Panels—7x10, \$1.25; 7x18, \$1.85; 9x10, \$1.60; 6x9, 95c; 5x5, 47c; 5x9, 95c; 6x12, \$1.25; 7x12, \$1.50; 7x9, \$1.15; 12x14, \$3; 7x24..... \$ 3.00
DIALS:	Spaghetti, per length..... .07½
\$1.00 Genuine Bakelite Dials—3-in. 45c; 4-in..... .55	Special Electric Soldering Iron, two heat..... 4.05
VARIOCOUPERS:	20c Bezel..... .15
\$7.00 Guaranteed Genuine Bakelite Pioneer Variocoupler, silk wound..... 4.75	PHONES:
\$4.25 Variocoupler, guaranteed high quality..... 2.25	\$5.00 Murrlock Phones..... 3.55
\$8.00 Moulded Variocoupler, highest quality..... 4.50	\$1.00 Freshman Variable Grid Leak..... .75
\$5.00 Shamrock Variocoupler..... 2.50	WIRE:
TRANSFORMERS:	100 ft. coil No. 14, 7-strand pure copper Aerial Wire..... .50
\$5.00 Acme Transformer..... 3.40	Magnet Wire 20 per cent. off list.
\$3.00 Radio Frequency Transformers..... 1.65	RHEOSTATS:
\$6.50 Wessco Audio Transformers, highest quality guaranteed..... 3.25	\$1.00 Rheostat..... .32
Thordarsen Transformer..... 2.50	Johns-Manville Bk. Com. Tubes, 3-in..... .25
\$3.00 Radio Frequency Transformer..... 1.50	DETECTORS:
VARIOMETERS:	\$.75 Crystal Detector..... .35
\$6.50 Pioneer Variometer, genuine Bakelite, silk wound..... 4.50	\$.40 K. D. Crystal Detector..... .16
\$6.00 Wessco Variometer, highest quality guaranteed..... 3.25	\$1.50 Multi Jack..... 1.15
\$4.50 Variometer, guaranteed high quality..... 2.40	\$1.50 Twin Adapter..... 1.15
\$6.50 Moulded Variometer, highest quality..... 3.50	\$1.25 Universal Plug..... .75
BATTERIES:	BATTERY CHARGERS:
\$ 6.75 Westinghouse Storage B Battery..... 4.75	\$18.00 Westinghouse Battery Chargers..... 14.40
\$24.00 A Battery, 100 Amp., 6 V..... 16.75	\$19.50 Westinghouse Battery Chargers for A & B Batteries..... 15.60
\$19.00 A Battery, 80 Amp., 6 V..... 11.45	70c Open Circuit Jack..... .25
\$14.50 A Battery, 60 Amp., 6 V..... 8.75	85c Double Circuit..... .30
\$3.00 Battery, 22½ V. Variable, highest quality guaranteed. Large size..... 1.45	75c Battery Hydrometer..... .35
\$1.75 B Battery, 22½ V. Variable, highest quality guaranteed. Small size..... .75	KNIFE SWITCHES:
\$7.00 Westinghouse Storage B Battery..... 5.50	Knife Switch S. P. S. T..... .14
\$1.00 W. D. A. Battery..... .55	Knife Switch S. P. D. T..... .22
CONDENSERS:	Knife Switch D. P. D. T..... .35
\$5.00 23-pl. Variable Condenser..... 1.65	Wooden Horn..... 5.50
\$5.50 43-pl. Variable Condenser..... 1.95	Contact Points..... .06
3-plate Vernier Variable Condenser..... .70	\$5.00 Standard Metal Horn..... 4.50
50c Mica Condensers..... .25	\$7.50 Standard Metal Horn..... 7.00
Thordarsen Grid Condenser..... .15	\$22.50 Pathe Large Speaker..... 15.00
Bronze Bus Bar, tinned, ft..... .02	
100 ft. pure Copper Antenna Wire..... .40	
MAGNAVOX—NEW TYPE, NEW CONSTRUCTION, NEW FINISH—ON SALE.	
\$10.00 Guaranteed highest quality Wessco Phones. Superior to any phone on the market at the price. Introductory price..... \$4.95	

Mounting for Spider Web Coils

Operating Dial Knobs Placed on Panel Front

Unless spider web coils are neatly constructed they present an unsightly object on the front of a receiving set. Even if they are neatly wound they are so large

WORKSHOP KINKS? EARN A DOLLAR—

THERE are many little kinks worked out at home that would aid your fellow Radio worker if he only knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. RADIO DIGEST is very much interested in securing such material. Send them in with full details, including stamped envelope so rejected copy may be returned. The work must be entirely original, not copied.

RADIO KINKS DEPARTMENT,
RADIO DIGEST,
123 West Madison St., Chicago, Ill.

they will extend out from the front and are in the way of the dial controls. It is always best to mount these coils on the inside of the case, but there is no suitable mounting for this purpose. The illustration shows a homemade device that controls the coils within the case by turning regular dial knobs on the panel front.

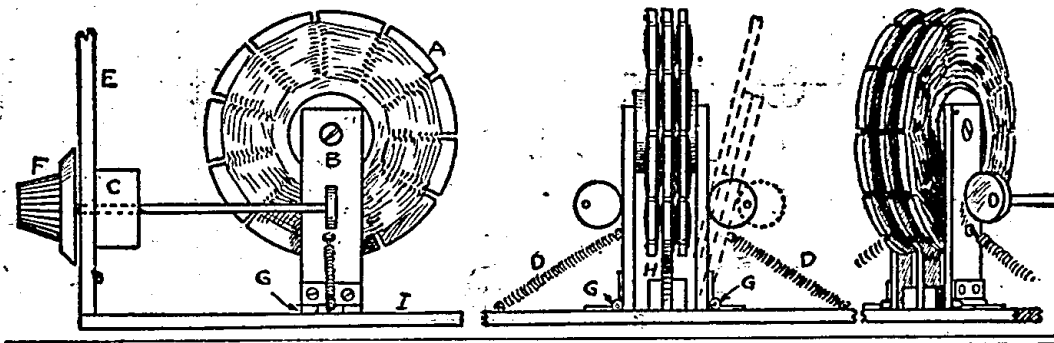
The center coil is made stationary by fastening it in an upright position, the other two coils are hinged on like supports to the base surface. The control of the hinged members are obtained by eccentric disks attached to the dial shafts. Coil springs are used to keep the hinged members against the eccentric.—Z. S. Musser, Anderson, Ind.

Inside Aerials

There are many possibilities open to the Radio enthusiast who is unable to erect an outside aerial, and the conditions attending each are so varied that he should try every one before deciding upon the best.

Where the set is located on the second floor or higher and a hallway fifty feet long or thereabout is available, four wires strung the full length will usually be the best sort of indoor aerial. The lead-in

ECCENTRICS MOVE OUTSIDE COILS

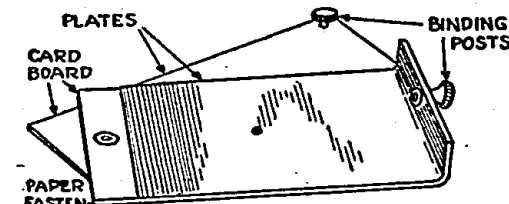


should then be taken from one end or from the middle, depending upon which is nearer the receiving set. All the wires should be joined at the lead-in.

Another possibility in the way of an indoor antenna is the bedspring. Several springs may be joined together with better results, a good contact being obtained by tightening the end of the wire beneath one of the brass nuts on the framework. Often the antenna post may be connected to the gas pipe and the ground post to the radiator or water pipe and excellent results secured.

Small Variable Condenser

When an amateur is experimenting, he often finds need of an extra variable condenser but as the experiment is only slight, he does not make the purchase of one for the occasion. The condenser herein described is homemade and it will over-

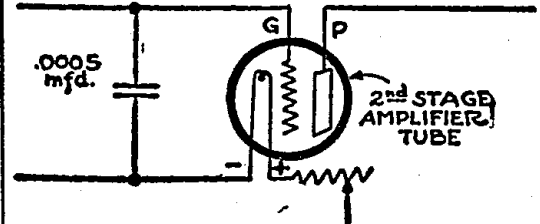


come the difficulty. Procure two sheets of stiff paper or cardboard of any convenient size, about 3 inches wide and 8 inches long. Paste or shellac a sheet of tinfoil on each piece, leaving at the end about 1/2-inch margin. In the center of this margin place a paper fastener so that the two parts will slide sideways on each other. Turn up the opposite end of the top plate, making 1/2-inch of it stand at right angles to the base. Place a binding post in the center of the upright part and

fasten another binding post on the end of the base piece. By simply sliding the plates on each other, the capacity may be varied. The maximum capacity of the condenser depends on the size of the plates.—John Barry, Cedar Rapids, Iowa.

Amplifier Tube Condenser

By using a fixed condenser of .0005 mfd. capacity across the grid and negative of the second stage amplifier tube the voice



and music will be much more natural and noises will be diminished to a great extent. A variable condenser will give slightly better results. This condenser used as described is of value, especially in loud talking instruments.—Arthur R. Klinger, Staunton, Ill.

Eliminating the Howl

One way to prevent the howl in regenerative receivers is to put a shield around the detector tube. Such a shield can be made from a piece of cardboard tube 1 1/4 inches in diameter and 2 1/2 inches long, with its outside covered with tinfoil, and grounded. Place this over the tube.—Mike Kertz, Cleveland, O.

Damp weather tends to shorten the useful life of any form of dry cell, including plate batteries, which should therefore be protected as much as possible.

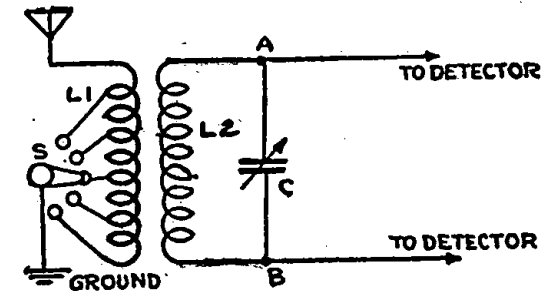
When your set does not seem to work while tuning in a station, do not blame the set but try another station. Some stations have poor modulation.

REINARTZ
ALL PARTS NECESSARY
DEALERS: WRITE FOR DISCOUNTS
HUDSON-ROSS
123 W. Madison St. Chicago

RUSONITE
CRYSTAL RECTIFIER
MULTIPOINT (Patent Pending)
A Synthetic CRYSTAL-DETECTOR sensitive over its entire surface
Eliminates all detector troubles. Extraordinary clearness and volume. Endorsed by Radio experts and press. Sold in Sealed Packages only. Join the ever increasing Rusonite fans.
Price, Postpaid, mounted 50c
Sensitiveness guaranteed
RUSONITE CATWHISKER
14 Karat Gold Multiple Contact Super Sensitive..... 25c
Order from your dealer or direct from us.
RUSONITE PRODUCTS CORP.
19 Park Row, N. Y.

A. B. C. LESSONS

(Continued from page 11)
coupler and a variable condenser. As shown, the antenna is connected to one end of the primary coil L-1, while the ground connection is made to the center of the rotating switch S which moves over the points to which the taps of the primary are connected. Across the



secondary of the coupler L-2 is connected the variable condenser C.

The operation of the circuit is as follows: By means of the switch S, the wave length of the antenna system is adjusted to that of the desired incoming waves. As these incoming oscillations flow through L-1, they establish a pulsating magnetic field which as it expands and collapses cuts the turns of the secondary L-2 and induces in it electrical oscillations of the same nature and frequency as originally flowed in the primary circuit.

In order that these oscillations in the secondary circuit may produce a maximum effect the closed circuit C-L-2 must be in resonance (have the same oscillation frequency) with the primary circuit. This is effected by adjusting the variable condenser C. Next the coupling between L-1 and L-2 is adjusted by rotating the secondary until the sounds are heard in the receivers with maximum intensity. The detector circuit is then connected across the terminals A and B and the electrical oscillations set up across the condenser are then increased upon the detector.

Variometer Used for Tuning
The use of a variometer for tuning purposes is clearly illustrated in Figure 26. Here the left hand part of the circuit is similar to that shown in Figure 25. The circuit is completed, however, by having connected across the points A B

the Variometer V in series with the detector and the phones. The circuit is operated by first adjusting the switch S until the antenna system is tuned to the desired wave length. Next, the circuit L-2-C is thrown into resonance by adjusting the variable condenser C and the degree of coupling between L-1 and L-2. After this has been accomplished the variometer-detector circuit is thrown into resonance by adjusting the position of the rotor of the variometer V. It is thus evident that with such completely tuned circuits maximum receiving efficiency is obtained. The variometer V in figure 26 tunes the circuit by altering the amount of inductance in it. If we compare the circuit illustrated in Figure 20 with that illustrated in Figure 26, we will at once see that the closed circuit in the former has no period of its own but must oscillate in unison with the waves coming from the antenna, while in Figure 26 the closed circuits are all perfectly tuned and will thus affect the detector with greater intensity.

This completes our study of the tuning process of the receiving station, and we are now ready to consider the two final operations to be performed, namely, the

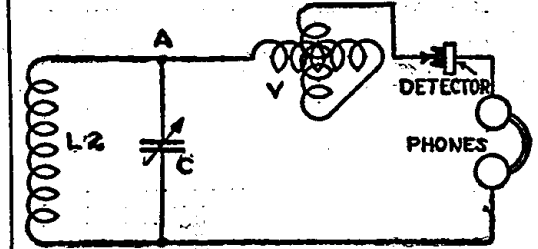


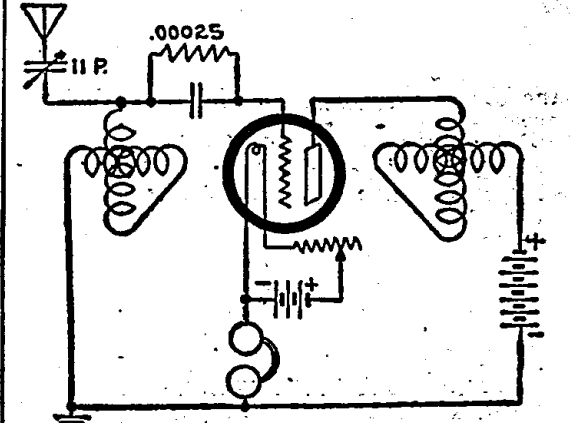
Figure 26 action of the detector and the telephone receivers.

Chapter Seven
In chapter seven, which is to appear in the next week's issue, we will make a detailed study of the crystal detector and how it serves to render the oscillations capable of affecting the telephone receivers so that audible sounds will be produced in accordance with those originally sent in to the transmitting station. Chapter seven will be of special interest because it will sum up in a practical manner the principles set forth in the last three chapters and apply them in the construction of an efficient receiving set.

Efficient Circuit for Use with Indoor Aerial

I have been experimenting for a long time on reception without an aerial and have at last come upon a circuit that is excellent for the indoor aerial type. This circuit is simple in construction when used with one step audio frequency. I find that stations can be readily copied at distances as great as 1500 miles with great ease and can be understood very plain.

My first experiment was with a single insulated wire in the molding in my room with one step of Radio frequency but the



results did not satisfy me and I changed my Radio frequency to audio frequency and dropped an insulated number 18 wire from my set out over the window ledge until it remained about 1 foot from the ground.

I was surprised at the results this produced and was able to copy with ease stations 700 miles distant, but still not being satisfied I next anchored an insulated wire at the top of my bed, passing it four times back and forth from head to foot of the bed and into the set. No change whatever was made in the circuit.

My results were so much better than the previous one that I always have used this type of aerial. When through I always disconnect the lead-in and wind it up on a spool which only takes a few minutes.

The circuit as submitted is used with an ordinary one step audio frequency with 22 and 40 volts respectively on the plates and six volts on the filaments.—D. P. Metzgar.

Signals come in better just at sundown and sunrise.

PHANTOM-CIRCUIT
Build Your Own. This marvel of mystery, using no loop, no aerial and no ground, brings in music instead of interference. We have heard stations 950 miles distant on one tube. By using WD-11 tube set can be entirely self contained. Very easy to build from our instructions, use your own spare parts, nothing complicated like radio frequency or super regenerative. Only one tuning control. Complete instructions, with hookup and photo of circuit mailed to you for 60 cents. Stamps accepted.
VESCO RADIO SHOP, Box D-704, Vacaville, Calif.

SWELLS EVERY NOTE INTO FULL RICHNESS MAKES YOUR OUTFIT COMPLETE
WITH
BALDWIN PHONES
Type C Unit, \$11.00
Type C Head Set, \$17.00
AT ALL GOOD DEALERS
SHELTONE LOUD SPEAKER
STATES ELECTRIC COMPANY, Agents
24 Clinton Street Newark, N. J.

Spirola BETTER LOUD SPEAKER \$3.85 TRUE CABINET TYPE
Not just a common horn built into a cabinet. Beautiful—Compact—THE TONE OF FINE CABINET PHONOGRAPHS. Make your two-step set a HOME ENTERTAINER. All SPIROLAS are of the best construction, with fine, rubbed finishes and are absolutely guaranteed.
SPIROLA DUPLEX—uses any headset. Satin Black (DB) finish \$3.85. Oak (DO) or mahogany (DM) finish \$4.85.
SPIROLA SIMPLEX—uses Baldwin or other unit. Black (SB) oak (SO), mahogany (SM) finish, same prices as DUPLEX.
SPIROLA CONCERT—complete with built-in unit and cord. Oak (CO) or mahogany (CM) finish \$12.50.
At dealers or postpaid (C. O. D. if preferred)
L. H. DONNELL MFG. CO., DEPT. D, BOX 70, ANN ARBOR, MICH.

Reinartz Panel Set Designed for Compactness

Cabinet for Popular Tuner Occupies Small Space

By H. J. Marx

THE popularity of the Flewelling Panel Set has created a demand for the same treatment of the Reinartz Circuit, not merely the detector stage, but also a two-stage audio frequency amplifier. It was at first considered rather doubtful whether or not the complete tuning unit and detector tube could be assembled on the popular seven by nine-inch panel. After considerable planning on the layout of the panel, the compact arrangement shown in Figure 1 was decided on.

Naturally it was impossible to account for all the different types of apparatus, so in most cases only the shaft hole is located, and the remainder of the drilled holes necessary for mounting can be filled in by the amateur as required by the apparatus used. Care must be exercised to avoid apparatus where the overall dimensions are too large for the compact assembly.

Controls on Panel

The controls on the panel, as shown in Figure 1, are: The five-contact point lever switch which is the secondary wave length control; the switch facing it, also having five contact points, controls the regeneration in the plate circuit; the eleven-point contact switch is the primary wave length control; the knob in the upper right corner is the rheostat control. The latter can be any of the average type. Vernier adjustment will be of considerable assistance, however, in getting the best results from the tube.

Going on with the discussion of the controls, the dial on the left side is the secondary condenser, having .0005 mfd. capacity and a vernier adjustment; the dial at the right is the plate condenser, capacity .00025 mfd., which should also have a vernier adjustment.

Some of the wound spider web coils on the market have different tap arrangements. If this is the case the number of tap holes for the three switches should conform to the taps on the coil to be used. Such a change in number does not necessarily affect the operation of the set.

The knob and pointer at the center between the two large condenser dials is the variable grid leak. This device will permit operation of the tube at maximum efficiency through the proper control of grid potential. A .00025 mfd. fixed condenser should be connected across the two grid leak terminals.

All the binding posts are marked and so need no further explanation.

Panel Layout

The panel should be 7 by 9 inches and 1/8 inch thick. The holes should be located and carefully centerpunched before drilling is commenced. Carefully centerpunch marks to avoid slipping of the drill, scratched panels and holes off-center.

The three countersunk holes in the base are for wood screws which fasten the panel to the baseboard. In drilling the holes for the switches and contact points, the number of taps must be considered. Also the fan will find that occasionally the contact points have larger or smaller heads. In any event the spacing dimension of the 1/4-inch, shown in Figure 2, will have to be altered so that the clearance of the contact points is about 1/8 inch. If this spacing is too great the switch lever is apt to jam between the points, or if too small it will be difficult to make connections in the rear without short circuits to adjacent points.

The three holes for mounting the rheostat are given inasmuch as a number of the standard types were found to be alike. It is advisable to check the location of the two outside holes, however.

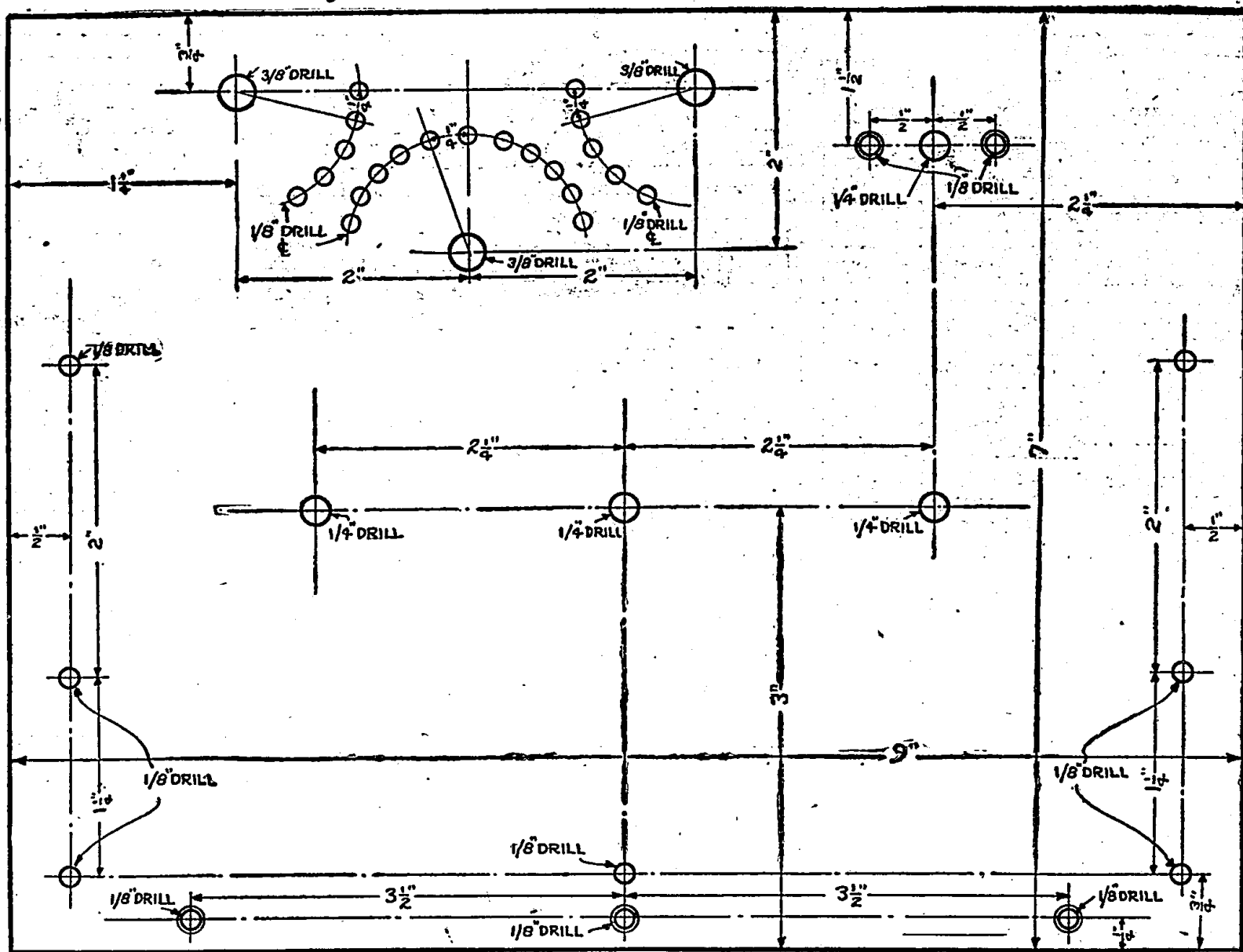


Figure 2

The three 1/4-inch holes give the shaft location for the two condensers and the variable grid leak. The holes for the mounting screws should be located as required by the apparatus.

The binding post holes will no doubt be found satisfactory for most of the types available on the market.

Further details of this panel Reinartz set will be given in the next issue.

ity distance, or lack of body capacity effect, when using the circuit without a vernier that could be secured with the use of them. This point of exact sharp and careful tuning when using the Super circuit, cannot be overemphasized.

The bank of condensers C3, C4 and C5 seem to cause, but little trouble except in

cases where the common paper dielectric condensers are used. Doubtless even these

(Continued on page 14)

FLEWELLING ON "HOW"

(Continued from page 9)

ceiver, a capacity change will be noted. If this is more noticeable with a Super it is probably due to the extraordinary sensitiveness of the set. However, a peculiar effect has been noticed, and a number of letters have been received coinciding directly with the writer's own observations to the effect that if a station is tuned exactly on its wave, so to speak, that is by accurate adjustment of vernier controls, audibility is enormously increased (thus agreeing with super regenerative theory) but body capacity seems to be practically eliminated. So much for this point.

It is well to note that testing with known stations under as nearly as possible the same conditions, that the author has never been able to obtain the audibil-

DEALERS
WRITE FOR DISCOUNTS
DUNGAN RADIO CO.
Distributors
68 WEST WASHINGTON ST., CHICAGO

.006
DUBILIER CONDENSERS
DEALERS: WRITE FOR DISCOUNTS
HUDSON-ROSS
123 W. Madison St. Chicago

DELICATE SOLDERING
The Post Soldering Iron
Platinum Heating Unit
Interchangeable Tips
(Large and Small)
Universal Current

ONE-HALF ACTUAL SIZE
LISTS AT **\$6.00** Awarded Certificate of Excellency, N. Y. Evening Mail Radio Institute
From your dealer or write
POST ELECTRIC COMPANY, Dept. 509, 30 E. 42nd St. NEW YORK

For The New Flewelling "Super" Circuit

FRESHMAN
VARIABLE GRID LEAK
With .00025 mfd. Micon Condenser Combined **\$1.00**
Without Condenser **\$0.75**

MICON .006
Tested Mica Condenser **\$1.00**

ESPECIALLY ADAPTABLE
At your dealers—otherwise send purchase price and you will be supplied postpaid.
Chas. Freshman Co., Inc.
97 Beekman Street, New York City

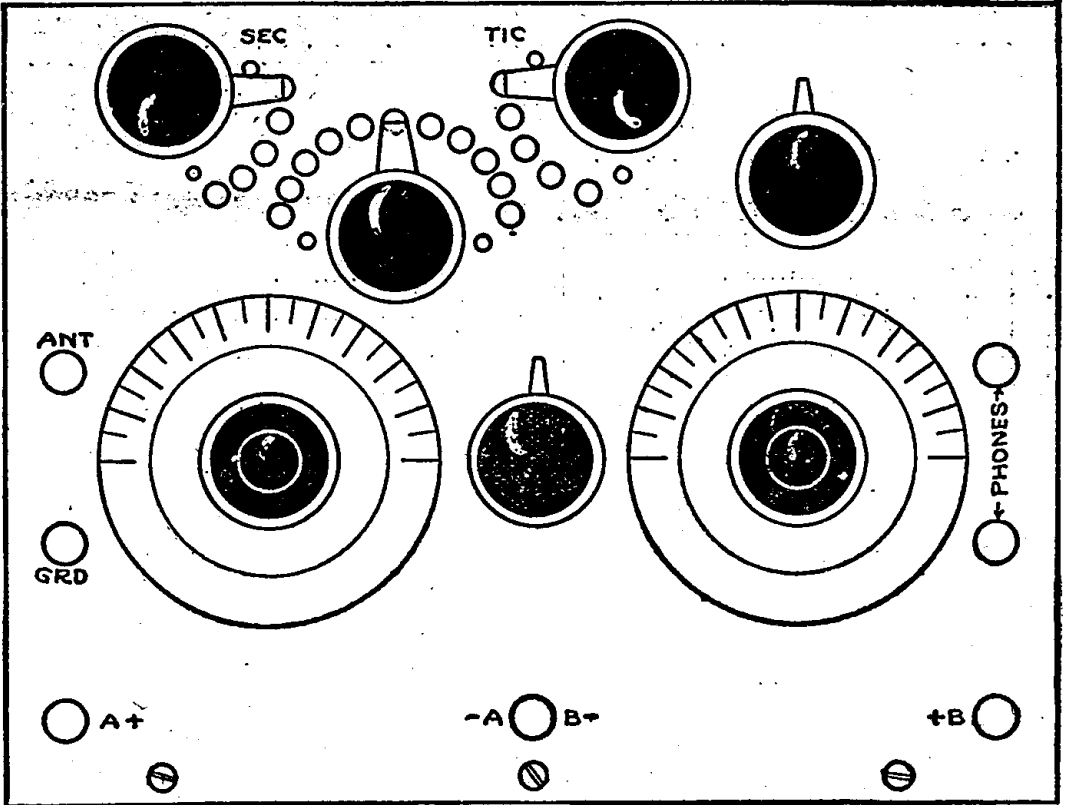


Figure 1.

The Reader's View

More Crystal DX Work

In response to George H. Cook's query as to crystal set records, published in The Reader's View of the Radio Digest for January 6, I wish to submit my record. Below are a few of the stations which I have heard and their airline distance from Pleasant Hill:

- WGM, Atlanta, Ga., 700 miles.
- WSB, Atlanta, Ga., 700 miles.
- WWJ, Detroit, Mich., 650 miles.
- WGY, Schenectady, N. Y., 1,150 miles.
- WLW, Cincinnati, O., 535 miles.
- WFAA, Dallas, Texas, 500 miles.
- WPA, Fort Worth, Texas, 500 miles.
- WBAP, Fort Worth, Texas, 500 miles.
- WLAG, Minneapolis, Minn., 500 miles.
- WOAI, San Antonio, Texas, 800 miles.
- WKY, Oklahoma City, Okla., 300 miles.
- WOC, Davenport, Iowa, 300 miles.

My set is even simpler than Mr. Cook's. It consists of a two-slide tuning coil, a crystal detector, and a fixed phone condenser. My aerial is one strand of solid wire, 115 feet long and 40 feet high.

On almost any clear night (after the local stations have signed off) I can pick up and enjoy programs from one or more of the above stations.—Ernest Pearce, Pleasant Hill, Mo.

Speaking of No. 2 Yellow Corn

I have a suggestion to make to the manufacturers and jobbers of Radio equipment: That they hurry up and build a transmitting station and broadcast Radio entertainment that the majority of buyers of Radio equipment want.

In Chicago, for instance, all but one of the broadcasting stations are controlled and operated by firms and institutions that are not in the Radio business, and they seem more interested in broadcasting market and stock reports, propaganda, etc.

Many times I listen in, and about all I can hear up to about 8 in the evening is No. 2 yellow corn, etc., etc., until I get so disgusted I am ready to smash up the set. Recently a Chicago station changed hands and the air is full of Radio waves that the majority of fans are not particularly interested in. If one wants to get real good Radio entertainment, he is compelled to wait until between 10 p. m. and 1 a. m. to get it.

I think the Radio firms should pause long enough to analyze the situation and ascertain if the people will continue to spend money for uninteresting news; also to find out if the majority of buyers of Radio equipment are people particularly interested in the market reports or what percentage of those market report fiends are really purchasers of Radio equipment. It seems to me if the manufacturers and Radio jobbers want to continue making money, they had better spend a little on broadcasting stations and give the Radio public programs that will keep them interested, and to transmit at a reasonable hour of the day or evening. Many local business men have sets and when at home for noon lunch about all they can hear is No. 2 yellow corn, etc., etc., ad nauseum.

The local stations can not be completely or successfully tuned out. Practically all through the day and during a good portion of the evening the Radio programs are of such a character that the man who looks to his set for entertainment is disappointed.

As to the remedy here it is: The firms that are making money out of Radio goods should get together and install a first-class broadcasting station and broadcast all through the day interesting musical programs on a wave length that can be tuned in without interference from other local stations that are cluttering up the air with market and stock reports, news, propaganda, etc.—Dr. Chas. E. Scharf, Chicago, Ill.

FLEWELLING ON "HOW"

(Continued from page 13)

as it does with an incoming signal it amplifies it greatly.

If the phones are touched (especially in the case of metal backed phones) while a station is being tuned in on any Radio set can be used if one is fortunate enough to procure extra good ones. The returns, however, have not been at all consistent and their use is not to be recommended.

At the time that the Super circuit was published it was almost impossible to secure a fixed mica dielectric condenser of larger capacity than .002 M. F. and in order to secure the necessary large capacity of .006 M. F. one was forced to connect three of this smaller capacity in multiple with each other.

A large number of letters have been received showing these smaller condensers in series with each other, and as this is a mistake which means failure of the set to operate, this point should be noted carefully in the accompanying illustrations. There is great stress to be laid on having full value or even greater for the condensers C3 and C4. If you are short of sufficient condensers to make up the full value for all three condensers, satisfactory results may be obtained if C5 is slighted in favor of the other two. The circuit will operate satisfactorily although full value is not used at C5, but will not do so if C3 and C4 are not full value.

Largest Radio Store in America

R-A-D-I-O

Largest Radio Store in America

BUY HERE FOR LESS

Radio Supplies purchased here are sold under a positive guarantee of satisfaction. We carry the largest new stock of first quality merchandise.

Complete Parts for Reinartz Circuit

Includes 1 7x18 Formica Panel, 1 Bakelite Socket, 1 Howard Vernier Rheostat, 23 Plate Condenser, 11 Plate Condenser, 3 Switch Levers, 2 Dozen Switch Points, 1 Reinartz Wound Coil, 1 Variable Grid Leak, 8 Binding Posts, 25 Feet Tinned Wire, 1 Base for Coil, 1 Mounting Base Board, and 1 Diagram to Construct This Set. Complete. **\$11.45**

COMPLETE KNOCKDOWN RECEIVING SET

This includes 2 Variometers, 1 Coupler, 3 Dials, 1 Rheostat, 1 Cunningham Detector Tube, 1 Bakelite Socket, 1 Mahogany Cabinet, 7x18 Formica Panel, 6 Binding Posts, 1 Switch Lever, 12 Switch Points, 2 Stops and 1 Diagram to construct this set. Set is capable of receiving 1,000 miles if installed with outdoor aerial. **\$17.95**

VARIABLE CONDENSERS

\$4.30 Value, 43 PLATE, now.....\$1.75 \$3.10 Value, 5 PLATE, now.....\$1.25
 \$3.70 Value, 23 PLATE, now.....\$1.45 \$2.70 Value, 3 PLATE, now.....\$1.15
 \$3.30 Value, 11 PLATE, now.....\$1.35

U.S.A. SIGNAL CORPS Aviation Type 194-W WESTERN ELECTRIC PHONES, \$7.95

Each Phone Cap is covered with large soft rubber ear cushions, and an aviation leather helmet goes with each set! These are the only phones to pass the Government specifications for sensitiveness and loudness, the requirements called for in aircraft reception.

COMPLETE PARTS FOR FLEWELLING CIRCUIT

Includes 6x14 Formica Panel, 23 Plate Condenser, 3 Micon .006 Condensers, 1 Freshman Variable Grid Leak, 1 Remler Leak, 2 Coil Mount, 2 Honeycomb Coils, 2 Coil Plugs, 1 Socket, 1 Howard Vernier Rheostat, 8 Binding Posts and 1 Diagram to Wire and Construct This Set. Complete. **\$12.45**

MAGNAVOX, LOUD SPEAKER, Type R3\$34.95

VARIOMETERS, Genuine Mahogany, \$5 Value, Now.....\$1.95

VARIOCOUPERS, \$4.50 Value, Now\$1.75

HONEYCOMB COILS

1,500 Turns.....\$1.50 750 Turns.....\$1.00 75 Turns.....40c
 1,250 Turns.....1.50 250 Turns......75c 50 Turns.....40c
 1,000 Turns.....1.25 150 Turns......60c
 100 Turns......50c 35 and 25 Turns.....40c

\$8.50 Guaranteed 3,000 Ohm

Head Phones \$3.65

RHEOSTATS 45c

SPONGE RUBBER EAR CAPS, Pair 50c

DIALS, 2, 3 and 3 1/2 inch 25c

Thordarson Amplifying TRANSFORMERS, \$4.50 Value, Now...\$2.95

GREWOL DETECTORS.....\$1.65

Signal Corps Super Sensitive Microphone Transmitters\$2.45

Solid Copper Aerial Wire, 100 ft.....	35c	2-Slide Tuning Coils, at.....	\$1.95	Anti-Capacity Switches.....	\$1.50
Spaghetti Tubing, yard.....	10c	3-Coil Honeycomb Mountings, with Knobs.....	\$4.20	Lightning Switches.....	\$2.65
Cord Tip.....	60c	Phone Caps, for mostly all phones.....	25c	Hydrometers, now at.....	45c
Plugs.....	95c	Signal Corps Hot Wire Ammeters, at.....	\$5.45	Freshman Variable Grid Leaks.....	95c

FORMICA PANEL, 1/8" thick, Black or Brown, Square Inch.....1 1/2c

We guarantee all Merchandise purchased of us. Mail orders receive immediate attention.

BUY HERE FOR LESS

CHICAGO SALVAGE STOCK STORE

509 South State Street

Chicago, Illinois

Questions and Answers

Coil Position

(1768) MLL, San Diego, Cal.

I built the Flewelling set according to your diagram and specifications. Everything came in fine but; first, for operation, the movable coil had to be always at right angles with the stationary coil. Is this perhaps due to the winding of the particular coils used being opposite to each other? If so, will reversion of the leads in either coil be the remedy?

Second, I could not make the set work without aerial or ground, even with broadcasting stations five blocks distant. I had to use both, ground and aerial, making my ground with a direct connection to the negative of the filament.

Third, in using loop aerial, I had to connect one lead of the loop to the aerial and one to the ground. The set works fine with a Magnavox, and I can bring in Station KHJ, Los Angeles, in this city (San Diego) on the Magnavox.

I used the combinations of 50 turns and tickler of 75 and also 100, but only the 75 works in combination with the 50. I could not use a 90-turn tickler coil, because they are not on the market.

I use, of course, a five-watt tube as detector.

Referring to the amplifier of the Flewelling, are the amplifier tubes supposed also to be five-watt tubes?

A.—We do not believe that the position of coils necessary for operation is due to the direction of winding, but rather to the character of the circuit. The 90-turn coil was made by unwinding ten turns from a 100-turn coil.

Use of a five-watt amplifier will give more volume than any of the other tubes afford.

This circuit requires very sharp tuning and lack of it accounts, undoubtedly, for your inability to hear without employing antenna and ground.

Loop Aerial Construction

(1764) WM, Dallas, Texas.

In connection with the Flewelling circuit published in your magazine, I desire further information as to the following:

1. Amount of B battery required for (a) detector, (b) first step audio, (c) second step audio.

2. Specifications for a loop aerial for this receiver.

3. Will set function properly if connected to both aerial and ground?

4. Can I substitute a single circuit jack for the two phone binding posts? Your criticism is requested as to this change.

A.—1. The voltage of B battery should be from 90 to 150 on all tubes.

2. Radio Digest of September 16th, page fourteen affords constructional data for a loop aerial.

3. This circuit will function properly using both aerial and ground.

4. Your substitution of single-circuit jack for two binding posts is correct and a very good idea.

Body Capacity

(1784) EDW, Berkeley, Calif.

I am constructing a super-flivver receiver using the Flewelling circuit described in your December 2 edition, page 13, and ask that you answer a few questions concerning it.

My set is to be mounted on a glass panel. I do not intend to use the condenser No. 4 in the aerial circuit, as I intend to use a loop aerial.

What size loop is advisable?

Can a peanut tube be used instead of C-301 tube?

Will it be necessary to shield the instruments from body capacity?

What range of wave lengths will it receive?

Can a loud speaker be operated without an amplifying circuit?

When first adjusting the grid leak (8) should the honeycomb coils 1 and 2 be parallel and should the condenser (3) be set at full or minimum capacity?

Will a .5 megohm leak (9) non-adjustable be suitable?

A.—Use a 10 to 12-turn loop, one-half inch space between turns and wound on a 30¹/₂ inch square.

Peanut or WD-11 tubes are satisfactory. Use 100 volts on their plates in this circuit.

Body capacity will be noticed probably in adjusting variable grid leak, or tickler coil coupling.

Wave length range as described is approximately 250 to 600 meters. For local stations you should be able to work the loud speaker, but you may need one step audio.

Keep honeycomb coils spread until grid leak is once set. After this adjust honeycomb coil coupling, then readjust grid leak if necessary. You will have to approximate correct tuning of coil by condenser 3 before doing anything else.

Yes, the leak (9), .5 megohm fixed, is proper.

Wants Variable Grid Leaks

(1748) IK, Douglas, Ariz.

May I ask a few questions about the Flewelling circuit? I have been a victim

of the Radio "disease" and the "doctors" prescribe my "medicine" to be a Flewelling set.

About how far can this circuit receive music? Kindly tell me where I can get the variable grid leaks used in the circuit? Can we use more than a four to one ratio transformer in this circuit without disastrous results?

A.—This circuit properly executed should afford a range of one thousand miles.

Personally we prefer to make grid leaks by ink or pencil lines which can be through experiment graduated to the correct value. Otherwise, must refer you to a dealer, several of whom advertise variable leaks in Radio Digest.

Although it may be possible to use a

more than four to one ratio transformer in the circuit, we would not, however, advise the use of a delicate pair of phones in conjunction with it.

Loop Antenna

(1922) JDB, St. Paul, Minn.

Slung the Flewelling hook-up together experimentally yesterday in about an hour, guessed at both grid-leaks and most everything else, and it came to life right off, bringing in KDKA with surprising volume both with indoor aerial and no ground, and with ground and no aerial.

Your diagram calls for shortening the antenna condenser if a loop is used. Should not this condenser be shunted across the loop? I do not see how one could tune

the thing without a condenser in the primary circuit somewhere.

A.—Congratulations for your success with the circuit in the experimental test. Antenna condenser may be shunted across the loop, as suggested, and thus will aid in tuning.

Receivers and Amplification

(1976) FNP, Nelsonville, Ohio

I would like to know if using Brandes receivers in a loud speaker with detector and two-stage of amplification would ruin the diaphragms? I have had several friends say it would ruin the silver diaphragms, and I would like to know.

A.—There could be no detrimental effects on the phones used, in the manner suggested, in a loud speaker.

Flewelling

Your Choice


BOUND VOLUMES

Numbers Two or Three

with One Year's Subscription to RADIO DIGEST

POSTPAID BY PARCEL POST

Limited Quantity



Better Hurry

GREATEST COLLECTION OF RADIO INFORMATION EVER PUBLISHED

VOLUME TWO	
Questions Answered	300
Simple Instruction Articles.....	30
Receiving Set Diagrams.....	3
How to Make Articles.....	66
New Apparatus	46
Pictures and Illustrations.....	350
Hookup Diagrams	142
Broadcasting Stations	17
Technical Articles	10
Book Reviews	78

VOLUME THREE	
Questions Answered	300
Simple Instruction Articles.....	28
Receiving Set Diagrams.....	5
How to Make Articles.....	100
New Apparatus	29
Pictures and Illustrations.....	360
Hookup Diagrams	75
Broadcasting Stations	10
Technical Articles	10
Book Reviews	77

65 Numbers

13 NUMBERS IN THE BOUND VOLUME
52 NUMBERS IN YEAR'S SUBSCRIPTION

VOLUMES TWO AND THREE

Now Ready for Delivery. Parcel Post
Prepaid, Each Only..... **\$2.00**

On account of the limited supply, the sale of these bound volumes is limited strictly to these readers of the Radio Digest who have subscribed for a year.

One year subscription to Radio Digest
and both bound volumes 2 and 3..... **\$7.00**

By subscribing now for one year to the Radio Digest you get both BOUND VOLUMES 2 AND 3, 25 numbers, with one year's subscription, for \$7.00.

ALL ORDERS MUST BE SENT DIRECT—No orders on this offer will be accepted through subscription agencies, news dealers or other sources. Check, money or express orders (no stamps) must accompany all orders.

COUPON

PUBLISHER, RADIO DIGEST,
123 West Madison St., Chicago, Illinois.

Please reserve me Bound Volume Number Two and also Number Three and one year's subscription to the Radio Digest, for which I am inclosing check—M. O. for Seven Dollars.

Please reserve me Bound Volume Number Two or Three and one year's subscription to the Radio Digest, for which I am enclosing check—M. O. for Five Dollars.

Name.....

Address.....

City..... State.....

May I ask a few questions about the Flewelling circuit? I have been a victim

Radio

Illustrated



Binocular stereoscope cinematography is a new invention through which an audience sees plays on the screen stereoscopically. You look with both eyes and see the roundness of pictures on the screen just the same as if the person were acting in front of you on the stage. The picture shows how the people of Mars appear to a Radio enthusiast who manages to get into communication with that planet. These Martian characters are shown through "Teleview" at the Selwyn Theater in a production called "M.A.R.S."



Character reading by Radio. You step up, lay your fingers outstretched on the pads and the automaton seated on a pedestal delivers her message to the subject, which in this case is Viscountess Maitland.
© Keystone



Mr. H. B. Thayer, President of the American Telephone and Telegraph Company, talking in New York over microphones to England.
© Fotograms



The latest accomplishment in the Radio world is that of pulling an aching tooth. Dr. A. E. Wood of the S. S. America recently directed a successful operation of this nature at sea, the first in the history of Radio.
© Wide World Photos