Coil Eliminates Much Frequency Resistance and Dielectric Loss

Less Wire Required to Produce Given Inductance Than in Type "D" or "8" Coils.—Inductors May be Wound and Mounted as Self-Supporting Units

BY G. N. GARRISON, I. R. E.

in this article I will discuss certain factors involved in the use in radio ciroults of the "D" coll, and I shall confine myself largely to a discussion what the "D" coll will not do rather than what it will do, and as there has been plenty written of late concerning what the "D" coll is supposed to do when used in radio receiving circuits.

In the first place, the D-coll is not now, for the "age" of this particular type of inductor may be stated in terms of years! I have in my laboratory now a number of 'D' onls which I built as far back as 1908—and which I later discarded for something better! The "original inventor" of the D-coll remains, to

national in the same of the forms of inductors; and for all purposes? We think not: for if we do, we are scheduled for a bitter disappointment. Especially duce these two properties--small external

field and small distributed capacity—are rained at an increase in radio equally Important energy-waster-high frequency

those above named.

It should be kept in mind that any soft still more high-frequency resistance is coil will have the greatest inductance only when its turns are parallel, and close, together; and the closer together they are, other things being equal, the greater will be the self-inductance of the foll for a windler more than twice as much be the self-inductance of the foll for a windler space on a tube than will the given length of wire. Howover, suppose, as in Fig. 1, we had

tion and connected together as shown as much dielectric in the field of the coll When placed in inductive relation to each, and the additional dielectric losses caused other the total inductance will be found thoreby are considerable, to be greater than the sum of the in- When all things are considered, it must

M = L + L' - 2M

the value (2M) depending upon closeness together or "coefficient

coupling," of the two colls, The same reasoning and formulae apply to the colls of Fig. 3, providing only that they are in inductive relation to each other and that their diameters are great compared to their length.

When inductively coupled, the spiral coils shown in Fig. 5 also follow the rule above stated and are governed by the same formulae.

same formulae.

In each of these cases the total inductance is always greater than the sum of the separate inductors. This means, in plain English, that, for a given value of inductance, such an arrangement, whatever may be its faults, uses less wire than
would a single coil of equal inductance.
Suppose that we would the two coils

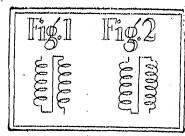
in opposite directions and connected them ns shown in Figs. 2, 4 or 6. The total inductance would then be expressed by the

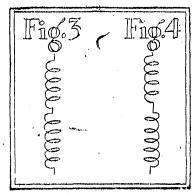
M = L + L + 2M

The fields of the two colls are now said to "oppose" each other and the total in-ductance, as may be readily seen, is always loss than the sum of the separate inductors. For a given value of inducfance. this arrangement will require more wire than would a single coil of equal in-

Both of these proporties of ordinary in ductors, when electromagnetically coupled are made use of in the variometre, but their application to the "D" coil will be explained a little inter-

Now, Fig. 7-a shows the usual form of "D" coll and, for all practical purposes, this device may be considered as two separate inductors, (A) and (B) inductively coupled to each other. The arrows show the flow of current through the winding at any elven instant. If will at once be seen that the current in coll (A)





Investigate

LIBERTY'S

Easy

TIME

PAYMENT

PLAN

partial

Money.

Will Save You

ANY RADIO SET

is flowing in the opposite direction from the flow in coll (B) in other words, their fields are opposing each other and, consequently, must be governed by the formula whove. Therefore, the same length of wire, it wound with its turns close together on an ordinary cylindrical tube of the same diameter, will give a greater inductance than our "D" coll.

At first consideration this may not appear important, but the high-frequency resistance of a conductor of circular cross section is proportional to its length and other things being equal, the less wire used to obtain a specific value of induc-tance, the smaller will be the high-frequency resistance.
In addition, our "D" coll of Fig. 7-a has

a considerable section of very small self-inductance; that section consisting of this day, inknown.

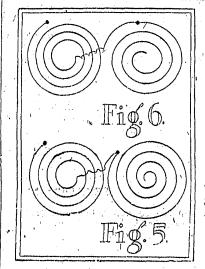
It is freely admitted that the usual type of "ID" coll has less external field and less apartly than most other inductors—but is this sufficient reason to of winding to produce a given inductance. of winding to produce a given inductance adding also, to the coll's high-frequency resistance.
Ply. 7-b is a side view of the sime coll.
It will be noted that there is a space (B)

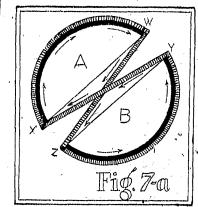
equal to the diameter of the wire (A) tween each turn. In the "D" coil this is necessarily so and its only redocming at tribute is that, by virtue of such spacing As far as can be ascertained, the spensors of the "D" coll claim no distinguishing characteristics other than the required industance; since the turns,

other things being equal, the greater will will require more than twice as much be the self-inductance of the coll for a winding space on a tube than will the ordinary, single-layer, Requiring more than twice as much wind-

When all things are considered, it must to be greater than the sam of the whole and the whole and the shaller external or the be "saststing" each other and the stray field and less distributed capacity of a "D" coll is more than compensated for by an increase in both high-frequency resistance and dielectric loses. In short, any superiority of this coll over a care fully designed "standard" inductor, is more imagined than real.

If, as is done in Fig. 8, we make use of two cylindrical forms, winding between them a single layer of wire, after the fashlon of a true figure "8," as shown, the efficiency of such an arrangement will





be slightly increased over what it was in the "D" coll, for less high frequency and delectric losses will occur. This is made possible by the fact that, for a given value of inductance, the coll of Fig. 8 will require less wire than that

RADIO CABINETS Made to Order

Highest grade of cabinet and ear-penter work. Specialty stock cut to dimensions—no order too small. GLEDHILL

PATTERNS AND MODELS 107 Friendship St.

Radio Chain Stores inc

Investigate LIBERTY'S Easy

85 Washington Street Strand Theatre Building

Branches: New York, Staten Island, Washington, D. C.

At Our Store Easy Radio Sets and Horns Easy Terms Every Week is Truth Week. Time Payments Our Experts' Im-Advice

We will install a 2, 3 or 5-tube radio set in your home. Terms to satisfy all. Our service will be of the best. Call at our store for further information which will be cheerfully given to you,

More for Less Money AT ALL TIMES in Our Store.

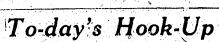
TIME

PAYMENT

PLAN

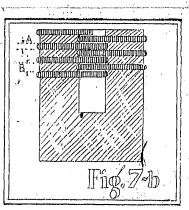
Courtoous, efficient service is a Liberty

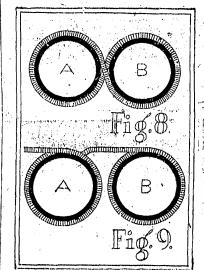
WE BUILD OR REPAIR | Our Tremendous Purchasing Power Assures You of the Lowest Prices





Simply Trying to be Courteous





ween these two colls in efficiency is only slight at best and results attained will probably not warrant the trouble involved

In its winding. In our Fig. 9 we show a more logical arrangement and one more in agreement with sound engineering principles. This arrangement is not new, in any ordinary sense of the term, but it is superior to any "D" coll ever built and for that reason, if for no other, its construction should prove of interest to the reader. . Coil (A) is wound with its turns close together, as is, also odl (B). After each

GIVES REMARKABLE RESULTS

A recent invention in crystals is amazing Reflex and Crystal Set owners everywhere. It is stated that this marvelous Crystal gets distant stations loud and clear, and there is no disagreeable "hunting" for spots because the entire surface is sensitive. Many are finding it far superior for reflex work and claim it is the last word in mounted synthetic crystals.

A Trial Costs You Nothing

In order to introduce his invention, the owner, Mr. Hick, offers, you two \$1.00 Crystals for the price of one, Sell one, and put the other on your own set without cost to you. Just send name and address to Mr. Hick Dept. 104, 1018 S. Wabash ave., Chicago, Pay postman \$1.00 (plus postage). Unless you are, absolutely satisfied, write Mr. Hick, and money will be cheerfully refunded.

number of turns, the bottom of coll (A) Navy are so large that it would take is connected with the top of coil (B) and they are permanently mounted in inductive relation to each other. The pair of coils of Fig. 9 is the practical application of the diagram of Fig.

I, and obeys the formula given in connec-tion therewith governing inductively coupled "assisting" coils. Such an arrangement has less high frequency resistance and less dielectric cosses than either the type "D" or "figure s" colls, for the reason that less wire is

required to produce a given inductance and less dielectric is used in the field of addition, these inductors may yound and supported, the dielectric loss

is reduced to a minimum-that of the "D" coll. The inductors shown in Fig. 9 may be used in any circuit where any coil is required, beside being used to replace the ordinary inductor, and their use will gen-

erally be found far superior, especially when wound self-supporting, to the coils. which they replace. Rather than present anything radically new in the above, we trust that our discussion has caused the reader to think along new lines and if we have but succeeded in inducing him to forsake the "beaten path" of least resistance in thought and action, the object of this article will have been fulfilled.

LOUD SPEAKERS ON BOATS

Radlo Dovices Used to Relay Orders On U. S. Navy Vessels

When John Paul Jones, commanding he Bonhemie Richard, the original Amercan man o' war, ordered "all hands to quarters," a hardy bo's'n blew the call on his little metal pipe and followed it ip with a lusty shout down the 'main hatch, But it is, a long time since Jones and his crew, on Sept. 23, 1779, captured the British frigate Scrapis, and

coll has been wound with the requisite now the battleships of the United States several minutes to sound a call in every part of the ship.

> The first of the American battleships to be equipped with telephones and loud speakers was the Arizona. This was "Connect with the steam radiator for lone in 1016, and the results, despite the act that loud speaker construction was n is infancy, were so encouraging that he navy equipped all subsequent large ships with these systems.

As the result of the co-operative, en-leavor of naval officers and divilian engineers specializing in telephony, the super-dreadnaught West Virginia has a elephone communication system that in-dudes 100 loud speakers so placed that

or the commanding officer's orders. \
This system is divided into five circuits which can be operated singly or all together, and there are three "talking stations," one on the bridge for use while at sea, another on the main deck att for use while in port, and the third in the hip control room for use during target practice or battle. This, however, has not rendered the bo's'n or his pipe ob-

enlete. Instead, Chief Boatswain's Mate Samuel Conover, tootles the calls just as they have always been piped and then for the benefit of any aboard who are not this-holded scattler and can't understant.

The elouded the commond into the recurrence
as the "talking sintion."

WHY NOT HAVE A.

HANSCOM SIX TUBE SECOND HARMONIC SUPERHETERODYNE

BUILT TO YOUR ORDER

The Utmost in Selectivity

cation Given in Your Home

PERLEY L. ANDREWS BOX 138, NORWOOD, R. I.





Interference Eliminator

What Radio Users Have Been Looking For. For those who have had Interference. Trouble this new auxiliary tuning device will trap out the undesired stations.

Select Your Stations at Will The air is so crowded with must and voices that the average set falls to bring in the desired stations out local and other interference. You got one station at a time, whatever one you want, and can tune it in loud and

Improved Results With Tube or Improved Results With Tube or Crystal

Try for yourself entirely at my risk the wonderful improvement this inexpensive liftle device will make in the reception of your set. Sold on absolute guarantee of satisfaction or money back and the greatest dollar's worth ever offered the radio public improves results on both erystal and tube sets that use an indoor aerial, outdoor aerial or light socket; but will not help a set using loop antenna. Cloars up reception wonderfully and partially absorbs static.

Mfrs, Ramous, 1,500 Mi, Steinite Tube Sets, \$12; Tong Distance Crystal Set, \$6; De Luxe Crystal Set, complete with headphones, nortal and ground, \$10; 2 Tube Set, \$16; 2 Tube Ampiller, \$15, FKEE descriptive literature on request.

Amazing Satisfaction or Money Back

Sats, \$12; Tong Distance Crystal Set, Complete with Sat De Luxe Crystal Set, complete with leadphones, nortal and ground, \$10; 2 Tube Set, \$10; 2 Tube Ampiller, \$10; 2 Tube Set, \$10; 2 Tube Ampiller, \$10; 2 Tube Instructions of couls needed and but a moment's time required to install. Full directions with each instrument. Simply connect with set and and delighted for you get money back promptly on your say so, \$1.00 postpald any where in U. S. when each accompanies order.

These two big Atchison banks will teadly to my, reliability: Exchange National Bank, Atchison Bayings Bank, Order to-day—a dollar bil will do.

STEINITE LABORATORIES

He found that when you take the ends of two wires and twist them together with your fingers the contact thus afforded isn't going, to be the sort that helps a radio set perform at its best. He discovered that though the lead-in wire may saw against a cornice of the house and not stop proceedings altogether it will cut reception radically, also causing what

stop proceedings altogether it will cut reception radically, also causing what often passes for static.

The variations in performance occasioned by his constant rearrangement of the lead-in and, his fussing with the makeshift connections told him very plainly that one of the first things is to prevent high loss through good insulation, good connections and low resistance wiring. "That's radio!" I reminded him. "You've got to go it radio's vay—or none at all." (Copyright, 1925, Ullman Feature Service)

an interesting error.

As I told him, when explaining the situation, "You're favoring yourself, not radio."

radio."
Smith tried to get away from all interference by stringing his antenna from high poles above the roof, never realizing that while this appeals to the human being as an ideal method of getting results it doesn't fit in with radio's own ideas along this line. A high antenna is not as selective as a lower one, though the latter does not give as good results in volume or in range.

in volume or in range.

Accordingly the aerial, when completed, ran about 10 feet above the roof. The lightning arrester was installed about six lightning arrester was installed about six inches from the side of the house between the lead-in and an insulated wire leading straight down to the earth and grounded. Just before the arrester the lead-in was tapped for a direct lead-in to the set itself.

The lightning arrester, Smith came to learn, is more of a protection against damaging the set than against fire damage from lightning. He could readily appreciate that the small wire of the aerial is even less of an attraction to lightning than the electric light wires or the metal water leaders and that, if actually struck, he serial would burn to pieces instantly the aerial would burn to pieces instantly. "The arrester," I explained, "provides protection against cak lighting action and protects your set when there is an electrical storm. If the potential in the aerial reaches too high a point a spark jumps the gap of the arrester and is

your set ground. And remember that the ground lead should be as short as pos-Keep it within six feet for best s. And be sure to scratch off the sible. radiator paint where you attach the

Then, having made sure that the arrester was well insulated and that the lead-in tube through the window frame

The temporary antenna proved to be a valuable experience for Smith, for it demonstrated to him the importance of details. And that is half the story.

He found that when you take the ends approved of his effort to hide all unneces.

sary paraphernalia.
"Now it ought to work like magic," he enthused. "That's the way I like to have

things. "Yes, but I wonder whether the radio likes it," I retorted. "I'm willing to bet you a new set of tubes that you've added

ENGLAND ON ONE-TUBE,

To the Editor of the Sunday Journal: Will you please tell in the Sunday Journal if England has ever been received n. Providence by a one-tube set and by

(Robert Davies of 51 Mitchell street has reported that on Nov. 25 he enjoyed the programme broadcast from Station 2-LO (London) and also heard the announcers in Aberdeen and Glasgow. He used a ne-tube set with a tuning coll chemically treated. Reception was clear, after considerable fading .- Ed.

Thompson Neutrodyne

stations with Thompson Neutrodyne after others fail to give satisfaction in his home.

All New Models in Stock

R. I. ELECTRICAL **ECUIPMENT CO**

45 WASHINGTON ST.

Cash or Easy Payments First Radio Store in Providence

WHERE THE FIRST

BROWNING DRAKE RECEIVER

WAS DISPLAYED IN PROVIDENCE

Three Months Ago the Browning Drake Set Was Being "Knocked" Badiy-At That Time Our Model Was on Display and Numbers of Customers Satisfied

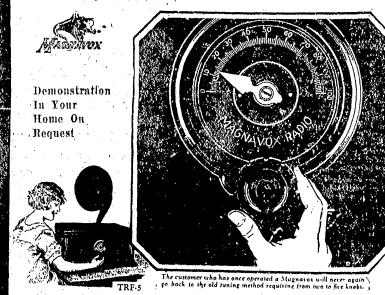
TO-DAY

The Browning Drake Receiver HAS OUTCLASSED THE ROBERTS AND OTHERS

> TO-DAY IT IS THE MOST

AUTHENTIC ADVICE DIRECT FROM PROFESSOR BROWNING'S LECTURE

THE NEW ONE-CONTROL **MAGNAVOX RECEIVERS**



The Magnavox Company does not guarantee their receivers unless purchased from a Registered Magnavox Dealer.

TYPE \$110.00 \$150.00 TRF-50

TILLEY RADIO

311 Woolworth Bldg.

187 Westminster Street

5:10-Church, WCCO.

6:00—Concert, KGW.
Vespers, WEAA.
Recital, WOO.
Choir, WSB.
6:30—Concert, KGO.

6:45-Church, WNAC.

Bible class, WFAA,
Orchestra, WJZ,
Music, WLIT,
Orchestra, WBZ,
7:30—Church, WOO.

Church, WWJ. Church, WGR. 7:45—Church, WGY.

Services, KYW.

Bible stories, WIAT, Forum, WBZ.

WHAP.

WEMC.

WHEL

Sermon, WJZ.

Church, KDKA. 8:00—Church, WFAA.

8:15-Concert, WJY.

8:30-Church, WSB.

Lecture, WJZ. 8:45—Church, WCCO. Orchestra, WJZ.

0:00—Church, KGW.
Orchestra, WGY.
Forum, WLIT.
9:15—Music, WIMC.

9:30—Opera, WGBS. 9:45—Music talk, KFI.

Church, KOA.
-Sermon, WEM

Talk, WHN.

Church, KGW. Talk, WJY. Quartet, WJZ. Lecture, WBZ.

Concert, WHN

7:05 p. m .- Continuation of programme

THURSDAY.

3:15 p. m .- Truth Week talk, to be an-

2:30 p. m.—Musical programme. 3:15 p. m.—Truth Week talk, to be an

3:30 p. m.-Musical programme con-

6:00 p. m.-A. story for the Radio Pals

by Fosters Story Lady.
6:15 p. m.—Concert by the "Belvedere

7:00 p. m.-Truth Week talk by Gard-

Distributors Of

A. C. DAYTON

RADIO SETS

Prov. Hardware

76 Mathewson Street

INDOORS

WHERE IT BELONGS!

ASK YOUR DEALER

The 25 and 50 foot lengths are sufficient for crystal sets or local reception and some distance on tube sets—ideal, too, for "boosters," counterpoise or ground substitute.

The correct length of any serial depends on the receiving set and surrounding conditions and is easily determined by experiment.

Judge Talking Tape by its performance

HOPE WEBBING COMPANY

& Supply Co.

2:30 p. m.-Instrumental music.

3:20 p. m.-Instrumental music.

10:00-Theatre, KFT

10:30-Church, KGO.

11:00—Recital, KFI. 11:15—Music, WHN.

12:00-Music, KFI.

by "Cole's Snappy Six."

No evening programmes.

ounced.

ounced.

tinued.

Trio.

Music, WFAA. 10:45—Orchestra, WHN.

Recital, WCDS.

Roxy, WEAR, WEEL, WCTS

7:00-Vespers, KFI.

5:10—Church, WCCO.
5:15—Organ recital, WGR.
5:20—Socoer game, WSAR.
5:30—Orchestra, WLIT.
Song service, WHAS.
String trio, WHN.

Concert, KDKA.

RADIO PROGRAMMES

put on the air daily by all stations, according to present plans. Wednesday evening WJAR will relay from New York a presentation of "Cavalleria Rusticana." and on the following night there will be another in the series of Victor concerts by opera singers. During the wook WEAN will broadcast several of the noon-day Lenten services from Grace Church.

WEAN, THE SHEPARD STORES (270 METRES)

TO-DAY. 10:45 a. m .- Entire service, broadcast from Graco Church, 7:30 p. m.—Mathewson Stroot Mothodist Church service: Organ prelude, "Imprivisation," Hall; Gray Brass Quartot, "Quartet from Martha," Flotow; hymn, Lancashire: prayer; chant, "The Lord's tot; Miss Virgin prayer," Novello; soprano solo, "Como trude Cauffield, Into Ilim" (from "Messiah") Handel; Holen Donahue. (into Him" (from "Alossiah") Handel; psaiter, "Eighth Sunday Evening;" Gloria, Patri, Greatorex; Gray Brass Quartet, "Sweet and Low," Barnby, "The Palms," Faure; offertory, anthem, "Lamb of God" (intermezzo), Elzet-Ryder; doxology, sermon, R. D. Hollington, "Washington, the Man Who Made the City" quartet. "Hand Man Who Made the City;" quartet, "Hark Hark My Soul," Shelley; benediction; amen, Neukomm; organ postlude, "War-

rior's Son," Heller-Blggs. 10:00 p. m.—Special broadcast by WEAN Noonday Club, with selections by the following members: Fred Weaks, Fred Prentice, Fred Travers, Herbert Tarryton, Fred Warren, George Gaskin, Florence Brown, Julie Beneit, 1dla Day, Poggy Green, Joseph Doak, WEAN Noonday Club Quartet, Kalua Hawalian Troupe. MONDAY

11:55 a. m.—Timo signals. 12:00 p. m.-Colonial Concert Orchestra. 12:10 p. m.-Weather report. 12:15 B. m --- WEAN Noonday Club. 4:00 p. m.—Organ recital by Prof. Edward Bonedlet, broadcast from Emery's Malestic Theatre. 115 p. m .- Colonial Danco Orchestra.

4:30 p. m.—Weather report. 4:35 p. m.—Saxophone and Clarinot solos by Samuel D. Strauss; saxophone solos by Isabello Strauss. 8:00 p. m .-- Address by Samuel D. Rob

bins, Better Speech Week talk on "Prevention of Speech Defects." 8:10 p. m.-Concert programme from TUBBDAY 7 10:00 a. m.-Mossage to Housewives by

Miss Gladys J. L. Peckham. 11:55 a. m .-- Time signals. 12:00 p. m .- Cofonial Concert Orches-

12:10 p. m -- Weather report 12:15 p. m.—Musical programmic. 1:00 p. m.—Colonial Danco Orchestra.

1:10 p. m.-Incidental music by the Emery Theatre Concert Orchestra, Willlum J. Faucher, director. 4:30 p. m.-Weather report. 4:35 p. m.-Mezzo soprano solos by

Mary Bennett, Eleanor T. Gormley, plan-6:30 p. m.-Shepard Colonial Orchestra

tenor solos by Leroy Goodwin. 8:10 p. m.-Orchestra, relayed

WEDNESDAY O : 11:55 a. m.--/Pimo signals. :

12:00 p. m.-Lenten noonday broadcast from Graco Church. 12:30 p. m.—Weather report. 4:00 p. m.—Organ reeltal by Prof. Ed-

ward Bonodict. 4:30 p. m.--Weather report. 4:35 p. m. -- Colonial Danco Orchestra. 8:00 p. m.-divening service from Ca-thedral Church of St. Paul, relayed from

10:45 p. m -- Organ recital by Prof. Edward Benedlet.

10:00 a. m .-- Message to Housewives by Miss Chadys J. L. Peckham, 11:55 a. m.—Time signals.

12:00 m.--Lenten noonday service broad-cast from Grace Church. 12:30 p. m .-- Weather report.

4:30 p. m.—Weather report. 4:35 p. m.—Barltone solos by Hugh Curry, Mrs. Hugh Curry, planist.

6.30 p. m .-- The Kalua Troupe Hawallar String Quartet tenor solos by Harold Strong: Vaughan Kazarlan, baritone; Rose Duart, violinist; Margaret Williams, soprano; George Claskins, planist.

FRIDAY. 11:55 a. m.—Time signals. 12:00 m.--Lenten noonday service broad-cast from Grace Church. 12:30 p. m .-- Weather report.

12:35 p. m .-- WEAN Noonday Club. 4:00 p. m.-Organ reoltal by Prof. Edward Benedict. 4:15 p. m.-Colonial Concert Orchestra

4:30 p. m.—Colomal Concert Grenestra. 4:35 p. m.—Colomal Dance Orchestra. 8:00 p. m.—Pettingill Andrews Gleo Club, relayed from Boston.

9:00 p. m.—Concert programme, 10:00 p. m.—Emery Theatro Concert Or SATURDAY, VY

10:00 a. m.-Message to Housewives by

Miss Gladys J. L. Peckham. 11:35 p. m.—Time signals. 12:00 m.—Colonial Concert Orchestra. 12:10 p. m.—Weather report. 12:15 p. m. -Musical programme. 4:00 p. m.-Colonial Dance Orchestra.

4:30 p. m.—Weather report. 4:35 p. m.—Colonial Dando Orchestra. 4:45 p. m.--Recital by Prof. Edward-Benedict.

8:00 p. m.-D. and L. Slade Spice Or-ohestra, relayed from Station WNAC, Bos-

10:00 p. m.-Copley Plaza Orchestra, direction W. Edward Boyle; popular songs, Irving Crocker and George Rogers, re-layed from Station WNAC.

WJAR, THE OUTLET COMPANY

(306 METRES)

TO-DAY.

Roxy and Ills Clang" direct from the Capitol Theatre, New York city, by courtesy of the Capitol Theatre management

Stocks Sawed for Specials RADIO CABINETS TABLES TO ORDER WOODWORK OF ALL KINDS J. M. Baker Pattern Co. 114 W. Exchange St. Union 5583 Corner of Mathewson St.



Truth Week talks, grand opera and and S. L. Rothafel (Roxy). The first part Lenten services are among the offerings of the programme will be taken from the stage of the theatre and will consist of music by featured artists and the Capital and the Capital artists are capital artists and the Capital artists are capital artists. the week by local broadcasting stations, tol Grand Orchestra. The second part of Truth Week talks by local men will be the programme will consist of a special presentation by Mr. Rothafel of vocal and instrumental artists direct from the broadcusting studio in the theatro.
9:15 p. m.—Organ recital direct from

the chapel at Columbia University, New 10:00 a. m.—Housewives! Radio Ex-

Wood on all matters of household inter-1:05 p. m - Truth Week lunchoon under

auspices of Town Criers of Rhode Island, direct from Biltmore Hotel. 7:30 p. m.—Talk on the Daughters of the American Revolution by Miss Bertha

7:35 p. m.—Mrs. Harvey J. Flint, President of the Rhode Island Tederation of Women's Clubs, will speak on "The Bet-ter Business Bureau and Its Relation to the Community."
7:40 p. m. Maurice Iacohere and quar-

tot; Miss Virginia Marshall, pianist; Gerrude Cauffield, soprano, accompanied by 8:50 p. m .-- Mrs. Gertrude Wilcox Harrop in one of the series of talks on the Red Cross.

Red Cross.
0:00-10:00 p. m.-Music by the A. and P. Cypsies. TUESDAY 1:05 p. m .- Providence Biltmore Hotel

Orchestra under the direction of Erwin 7:30 p. m .- Prof. Raiph Badger, Brown University, will speak on "Truth in Edueation.

7:35 p. m.-Programme under the direction of Florence Corley Hurley; Mrs. Waldron, soprano.

8:00 p. m.—Troubadour Orchestra under the direction of Lester Denault.

8:15 p. m.—Troubadour Orchestra, 8:30 p. m.—"The Gold Dust Twins," 9:00 p. m.—"Evòready Hour." 10:00 p.'m.—The Sivertown Cord Orchestra under the direction of Joseph Knecht. WEDNESDAY

10:00 a. m .- Housewives' Radio Exshange. A department conducted by Mrs. Wood on all matters of household interest. 1:05 p. m.—Brown University Jazz Team inder the direction of Philip Bronstein, Gardner T. Swarts. Chief Crier of the lown Criors, will speak on "Truth and the Public."

7:30 p. m.-This programme will come direct from New York studio. Concert by the United States Army Band under the direction of Warrant Officer William J. Stannard, direct from Washington, D. C. 8:30 p. m.-Modena Scoville, planist,

8:50 p. m.—Bessie Richards, soprano. 9:00 p. m.—"Atwater Kent Radio Ar-10:00 p. m .- Rizzi Grand Opera Com-

pany, consisting of Mmo. Gemma Rizzi, soprano: Marguerite Warnoke, contraito; Guiseppe di Benedetto, tenor, and Imeric Perrari, baritone. THURSDAY

1:05 p. m .-- Arthur Rothman's Radio Or hestra; Miss Alice McHugh, reader. 8:00 p. m.—Winifred Mauer, planist, 8:15 p. m.-Guiseppe De Benedetto, opratic tenor.

8:30 p. m.—Oscar Nicastro, 'cellisti 8:50 p. m.—Gulseppe De Benedetto, 9:00 p. m.—"Victor Presentation" under the auspices of the Victor Talking Ma-chine Company: Victor Concert Orchestra; Mme. Toti, Dal Monte, coloratura so prano: Gulsoppe do Lauca, baritone of the Metropolitan Opera Company.
10:00 p. m.—The Silvertown Chord Or under the direction of Joseph

FRIDAY.

m .-- Housewives' Radio : 10xhange. A department conducted by Mrs. Vood on all matters of householf interest. 16:00 a. m.—Talk on Red Cross work. 1:05 p. m.—The Woodstock Orchestra inder the direction of Martin J. Casey. Irginia Campbell, reader; Juliana 'Allen, soprano: Eddle Bourne, planist; Carl

Agronick, violinist. 2:00 p. m.—Carl B. Marshall of Brown, Lisic & Marshall, "Protecting Unwary

7:15 p. m.-Plano "Musik Tawkalog" by Mabel Woolsey. The fifth of an educaional series especially arranged for

plano students. 7:45 p. m.—John J. Collins of Ostby & Barton will talk on "Standards of Prac-

7:50 p. m -- William J. Carrigan, tenor Programmo selected.

9:00 p. m.—B. Fischer & Co.'s Astor
Coffee Dance Orchestra.

11:00 p. m.—Providence Biltmore Hotel
Orchestra, under the direction of Edwin

White. SATURDAY, 1:05 p. m.—Twin Elim Orchestra. 2:00 p. m.—Flint Grinnell of the Better Business Bureau of Providence will talk n "Better Business Bureau Movement." Silent night.

> WSAD, FOSTERS. (256 METRES)

MONDAY.

2:30 p. m.—Musical programme.

3:45 p. m.—Truth Week talk by Flint
Grinnell, director of the Better Business

HIGHLY selective, pre-logged at the factory, simple to operate, with ample volume and clear, almost faultless reception, are the superior features of the A-C Dayton X-5.

A fine \five-tube receiver. Tuned radio frequency. Luxurious mahogany cabinet—at \$115.00.

A=C ELECTRICAL CO.

OF NEW BUGGAND



To-day's Programmes in Brief

For the convenience of radio fans, the following hourly schedule of broadcasting to-day is given in brief form, the complete programme being given under the regular listing of announcements. The hours are based on Eastern Standard Time.

10:00—Chimes, WDWF. 4:00-Concert, WDAN. 5:00-Recital, WDWF. 7:20—Concert, WJAR. 7:30—Church, WEAN. 0:15—Organ recital, WJAR. 10:00—Concert, WEAN.

LOCAL STATIONS

OUT-OF-TOWN STATIONS 9:00—Children's hour, WJZ. 10:30—Church, WSAR, 10:45-Church, WIP. Church, WCAE.

Church, KDKA. 10:55-Church, WBZ. 11:00-Church, WGY. Church, WJZ. Church, WHAS. Church, WNAC. 11:30-Church, WCCO, 12:00-Music, WIMC.

Church, WSB, Church, KYW. 12:40-Sermon, WEMC. 1:00-Church, KFI. Church, KOA. -Church, KGW. 2:00-Church, KGO.

Songs, WEAF. Orchestra, WWJ. Mothers' Day, KDKA, 2:30—Music, WOO. Bible class, WJZ. Church, WCAE. Concert, KDKA.

2:45-Services, WEAF, 3:00—Concert, WLIT. Services, WHN. Vespers, WGR. -Concert, WBZ. 3:30-Matince musicale, WGBS.

Music, WJZ.
3:35—Orohestra, WGY.
3:45—Mon's conference, WEEI, 3:45-Mon's WDAF.

4:00—Vespers, WJZ. Music; WCAE. Organ recital, KDKA. Band, WHN. Concert, WNAC, Organ recital, WGR. Lecture, WSB.
Y. M. C. A., WIF.
Music, WHN.
Concert, WSAR.

5:00-Organ recital, WGY. Concert, KYW. Recital, WHAS.

Better Business Bureau."

tinued.

inued.

Story Lady.

nounced.

Bureau of Providence, "The Work of the

3:50 p. m.-Musical programme con-

0:00 p. m.-Radio Pals story by Fosters'

Story Lady.
6:15 p. m.—Concert by "Billy Cahill's Superb Dance Orchestra,"

7:00 p, m.—Truth Week talk by Carl B. Marshall, "Separating the Wheat from the Chaft."

7:10 p. m.—Continuation of concert by

"Billy Cahill's Superb Dance Orchestra."

TUESDAY.

2:30 p. m.—Instrumental music. 3:15 p. m.—Truth Week talk by H. Harold Price: "A Jewel Above Price."

3:20 p. m.-Instrumental music con-

6:00 p. m .- Radio Pals story by Fosters

6:15 p. m.-Truth Week talk to be an-

WEDNESDAY 2:30 p. m.—An Eddson programme. 3:15 p. m.—Truth Week talk by Rabbi Samuel Gup: "Observation on Truth."

3:20 p. m.-Edison programme con-

0:00 p. m.-Wednesday evening Radio

Pals entertainment by Fosters Story and, assisted by Dolly Gibb and Marion

6:20 p. m.-Concert by "Cole's Snappy

7:00 p. m.-Truth Week talk to be an-

UNCLE SAM COILS

are the most revolutionary radio instrument yet devised. Takes the place

UNOIS SAM BLECTRIC CO., 100 E. Sixth St., Plainfield, N. J.

is Reliability

Several ALL-AMERICAN Au-

dio Transformers, soaked in

water for three weeks, afterwards tested 100% perfect and performed

faultlessly in a radio receiving set.

Yet ALL-AMERICANS cost no more.

There is an ALL-AMERICAN

Transformer for every radio need -Audio and Radio Fre-

quency—Power Amplifying (Push-Pull)—Intermediate

All-Amax Receivers

The famous ALL-AMERICAN

long-distance sets completely

mounted, with full photographic instructions for wiring.
All-Amax Junior (1 tube) \$22.00
All-Amax Senior (3 tubes) 42.00

Your Favorite Radio Store Has Them

Largest Selling Transformers

in the World

Frequency.

This-

Ask your dealor or send us four conts in stamps for wiring diagrams using this colt as suggested by Boston American, Transcript, Browning & Drake, etc.

Town Orier of Rhode Island: "Truth and the Public." 7:05 p. m.—Continuation of concert by the "Belvedere Trio." SATURDAY. 2:80 p. m.-Dance music by the Bruns-

vick Dance Orchestra. 8:15 p. m .- Truth Week talk, to be an-3:20 p. m.-Continuation of dance music by the Brunswick Dance Orchestra.

6:00 p. m.—Saturday night story for the Radio Pals by Fosters Story Lady. 6:15 p. m.—Regular Saturday dance music by Lar Potter's Orchestra. Week talks, to be announced, 7:05 p. m.—Continuation of dance music by Lar Potter's Orchestra.

> WDWF, DUTEE W. FLINT, INC. (441 METRES)

10:00 a. m.-Chimes. 5:00 p. m.—Radio recital, Part 1: Venetian Serenaders; Part 2: Organ recital by E. Rupert Sircom TUESDAY

8;30 p. m.—Arcadia Dance Orchestra. 7:00 p. m.—Rhode Island Bankers' Dinnor, Providence-Biltmore Hotel,

FRIDAY 8:00 p. m.—Lecture by member of Brown University faculty, followed by plane recital by Dorothy Brown.

KGO, OAKLAND, CAL.

(800 METRES) TO-DAY.
2:00 p. m.—Service of the First Presbyterian Church, Oakland; Rev. Frank M.

Silsley, D. D., pastor. 6:30 p. m.—Concert by the KGO Little Symphony Orchestra, Carl Rhodehamel, conductor; Arthur S. Garbett, musical interpretative writer; guest artists, 10:30 p. m.—Service, of the First Presby-terian Church, Oakland, Rev. Frank M. Silsley, D. D., pastor.

> WSAR, FALL RIVER, MASS. (254 MICTRES)

TO-DAY. 10:30 a. m.-Service of Union M. E.

WALTER W. MASSIE Consulting

Radio Engineer

Charter Member Institute of Radio Engineers Consultant to manufacturers, dealers and users of radio ap-

Shop and laboratory facilities manufacturing, repairing and testing. Phone Broad 0507

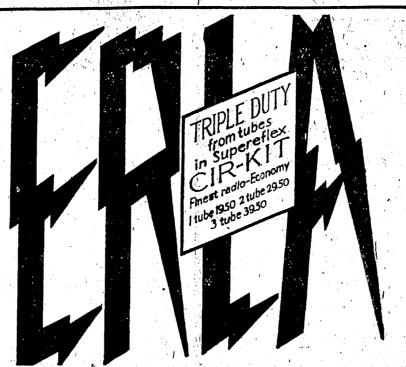
for Appointment

SHUMAN HAWS ADV. CO. Ad No. 7769 NP. Ad No. 17 1 col. x 100 lines



Always Uniform

Chosen-after stiffest tests-by the majority of quality set builders. Not surprising, how-ever, when you remember they're made and unconditionally guaranteed by the world's oldest and largest exclusive transformer manufacturer. Follow the lead of the leaders —buildor replace with Thordarsons. Recommended by best dealers, Audio frequency: 2-1,85; 35;-1,84;6-1,84.50. Power Amplifying, pair, \$13. Interstage Power Amplifying Transformer, \$3. Write for latest bulleting. THERMARSON ELECTRIC MFG. CO. SUBJECT



ner T. Swarts, Jr., Chief Crier of the Church, including sermon by Rev. Robert Episcopal Church, Denver, Rev. Loren M. Town Criers of Rhode Island: "Truth and Colpitts, and singing by the regular choir. Edwards, D. D., minister. 4:30 p. m.—Nepeldo Trio—violin, plane and 'cello.

4:45 p. m.-Tenor solos by Kennoth 4:55 p. m.—Talk, "Character Building and Girls," by Miss Marion Hope.

5:10 p. m.—Pisie Houlker, soprano, in solo numbers. 5:20 p. m.-Result of Fall River-Brooklyn soocer game.

KFI, LOS ANGELES, CAL (460 METRES) TO-DAY.

1:00 p., m.-L. A. Church Federation

7:00 p. m.-Vesper services, June Evans mezzo-soprano, and others. 9:45 p. m.-KFI editorial and music ap-10:00 p. m.-Metropolitan Theatre Pro-

11:00 p. m.-Special classic recital. 12:00 p. m.-Los Angeles Examiner programme. 1:00 a. m.—Packard Eight Orchestra, under direction of William Hennessy.

KOA, DENVER, COL.

(323 METRES) 1:00 p. m.—Service of Trinity Methodist Episcopal Church, Denver, Rev. Loren M. Edwards, D. D., minister.

9:45 p. m.—Service of Trinity Methodist

THE HANSCOM

EASY TO BUILD EASY TO OPERATE EASY TO OPENATE
A second harmonic super heterodyne is the utmost in selectivity. Why bother with less efficient sets? Price of unit alone \$37.50 (tested on at least three distant stations.) Buttre set of parts

Marshall & Co. Where they know the Neutrodyne 94 DORRANCE STREET 94 Opp. Narragansett Hotel

KYW, CHICAGO, ILL. TO-DAY.

12 m.—Central Church service will bs broadcast from Orchestra Hall, Chloago. Dr. F. F. Shannon, pastor, Musical programme will be arranged under the direction of Daniel Protheroe.

5:00 p. m.-Studio concert will be broadeast from Hearst square. Artists and detailed programme will be announced by

8:00 p. m.—Chicago Sunday Evening Club service will be broadcast from Or-chestra Hall, Chicago. The musical pro-Continued on Page Twelve.



WIN.

This Week Only \$5 ALLOWANCE CRYSTAL SET

Towards your purchase of one of the following tube sets RADIOLA III., 2-TUBE SET. RADIOLA III., BALANCED AMPLIFIEB RADIOLA III.-A, 4-TUBE SET ' RADIOLA REGENOFLEX AND SUPERHETERODYNE

> WARE NEUTRODYNE, 8-TUBE REFLEX ATWATER KENT, 5-TUBE RADIO FREQUENCY MAGNAVOX 5-TUBE SINGLE CONTROL THOMPSON NEUTRODYNE, 5 or 6 TUBES

CROSLEY TRIRDYN, 8-TUBE REFLEX

Clip the coupon below and present it with your crystal set. If you cannot conveniently call, mail coupon and our representative will visit you?

"Leave It To Us And Be Satisfied"

BLANCHARD RADIO & ELECTRIC CO., Inc.

208 WOOLWORTH BLDG., PROVIDENCE

I would like to trade in my crystal set towards a tube set. This coupon with my crystal set is good for \$5 credit.

N —Dependability -Courtesy -Service

THE CAUSES of the steady in-L crease in patronage at The

Shepard Radio Store. As local representatives of the Leading Radio Receivers, we are at all times ready to serve you.

> The Brightson True Blue Tubes

Standard Base Tubes are now ready for delivery. Small Base Tubes-orders being taken.

For over two months True Blue Tubes have been used by: some of our customers in The Famous Magnavox Sets Also in the Super-Zenith Sets

Becoming So Popular in Providence And Have Proved Eminently Satisfactory The Magnavox Company has made a reduction in the price. of the M-4 Reproducer from 25.00 to 16.00, thereby enabling anyone to now obtain a speaker of excellent tone, quality and

one that is noted for performance at a very moderate outlay.

RADIO PROGRAMMES

Continued from Page Bleven.

grammo will be arranged by Edgar Nelson. The speaker of the evening will be announced by radio.

KGW, PORTLAND, ORE. (402 METRES)

TO-DAY, 1:30 p. m.—Services from First Presbyterian Church, Dr. Harold Leonard Bow-0:00 p. m .- Municipal concert by wire

telephony from auditorium.

0:00 p. m.—Church services provided by the Portland Council of Churches, 10:00 p. m.-Dinner concert by Colburn Centert Orchestra of Hotel Portland; intermission solos, Nellio Torgior, pianist:

WCAE, PITTSBURGH, PA. (401 METRES)

TO-DAY.

10:45 a. m.—Services from Rodet Sha

3:00 p. m.-People's Radio Church serv ices. 1:00 p. m.—Plano recital by Prof. Otto

Kaltels. 0:30 p. m.—Dinner concert transmitted from William Penn Hotel.

WCCO, MINNEAPOLIS-ST. PAUL. (417 METRES)

TO-DAY. 11:20 a. m.-Plymouth Congregational Church, Minneapolis, Rev. H. P. Dowey, D. D., pastor. 5:10 p. m.—House of Hope Presbyterian

Church, St. Paul, Roy. H. C. Swearingen, D. D., pastor. 8:45 p. m.—Central Lutheran Church, Minneapolis, Rev. J. A. O. Stub, D. D.,

10:15 p. m .-- Classical concert.

WEAF, NEW YORK CITY. (402 MISTRISS)

TO-DAX.

3:00 p. m.—"Sunday hymn sing" under the auspices of the Greater New York Federation of Churches.

2:45 p. m.-Interdenominational services under the auspices of the Greater New York Federation of Churches, Rov. William B. Millar, general secretary, presiding. Address by Rov. S. Edward Young, D. D., pastor of Bedford Presbyterian Church, Brooklyn, N. Y. Music by Federal Church, Brooklyn, N. Y. Music by Federal Red President Research P evation Radio Group and male quartet, with Arthur Billings Hunt, baritone and musical director: Gladys C. Hill, soprano Mildred Bryars, contralto: Louis Caton tenor; Paul Merritt, baritone; George Vause, planist, and William H. Browster, organist and basso, togother with Alda Brass Quartet, consisting of Clara Flaven, Helen Batchelder, Eleanor Betts and Cora

3:45 p. m.—Men's conference in the Bedford Branch Y. M. C. A., Brooklyn, N. Y. Halsey Hammond, executive secretary, prosiding. Address by Dr. S. Parkes Cadman, subject, "George Washington." Answers to questions by Dr. Cadman follow the address. Special music by the Chorla Trumpoters. Howard Wade Kim-sey, song leader; Mrs. Howard Wade Kimsey, accompanist; George Betts, chime 7:20 to 9:15 p. m .- Musical programme

by "Roxy and His Gang," direct from the Capitol Theatre, New York city, by cour-tesy of the Capitol Theatre management and S. L. Rothafel (Roxy). The first part of the programme will be taken from the stage of the theatre and will consist of music by featured artists and the Capitol Grand Orchestra. The second part presentation by Mr. Rothafel of vocal and instrumental artists direct from broadcasting sudio in the theatre.

9:15 p. m.-Organ recital direct from the chapel at Columbia University, New

WEEI, BOSTON, MASS.

(476 METRES)

TO-DAY,

1:45 tp. m.--Mon's conforence in the Redford Branch, Y. M. C. A., Brooklyn, 7:20 p. m .- "Roxy and his Gang," New York Capitol Theatre.

9:15 p. m.—Organ recital, chapel at Co-

lumbia University, New York city.

WEMC, BERRIEN SPRINGS, MICH. (885 METRES)

TO-DAY.

12:00 m.—Sacred music by the Radio Lighthouse Cheir; Ceell Woods, bass; Miss Totile Kressin, soprano. 12:40 p. m.-Sermon, Pastor

9:15 p. m.—Sacred music by the Radio Lighthouse Choir; Ernest Furd, tenor; Miss Martha Hutchinson, soprano. 9:55 p. m .-- Sermon, Pastor John Knox.

WFAA, DALLAS, TEX. (476 METRES)

TO-DAY 6:00 p. in.-Vespor service at Westmin-ster Presbyterian Church, Dr. T. O. Perrin, pastor; Miss Daisy Polk, soloist and

7:00 p. m.—Radio Biblo class, Dr. William M. Anderson, paster, Eirst Presbyterian Church, teacher: Bible study and gospel song.

8:00 p. m.—Service at Central Congregational Church, Dr. Thomas H. Harper, paster; Mrs. Clarence R. Hamilton, or-

9:30 p. m.—Dr. Robert A. Hunt, paster Pirst Methodist Church, in sacred song

recital and hymnologue.
10:30 p. m.—McDowell Sisters in Ha-wallan and sacred music recital.

WGBS; NEW YORK CITY. (816 KETRES)

TO-DAY

3:30 p. m.—Matinee musical from Piccadilly Theatre.
9:30 p. m.—Rossini's "Barber of Soville," second in series of complete radio operas presented by WGBS and Corriero D'America.

WGY, SCHENECTADY, N. Y. (879.8 METRES) TO-DAY.

11:00 a. m .- Service of St. Peter's Episcopal Church, Albany; sormon by the Roy, 3:35 p. m.—WGY Symphony Orchestra

Radio Cabinets Why not a genuine Mahogany, little

difference in cost?

Can make inexpensive or claborate

Robert P. O'Brien

86 Calverly St. Wood and Metal Patterns Cablact Making, Carpenters', Jobbing Bronze and Aluminum Castings Stock Bronze or at a Few Hours Notice

Aluminum Pattern Plates

Leo Kliwen, conductor; Ben Franklin

5:00 p. m .- Organ recital by Dr. Frank Sill Rogers, assisted by T. Roy Kecfer, violinist, from St. Peter's Episcopa 7:45 p. m. Service of First Presbyterian

Church, Albany; address, "Washington," by Prof. Adna W. Risloy, New York State College for Teachers. 9:00 p. m .-- Waldorf-Astoria Orchestra

Now York, Joseph Knecht, conductor; also broadcast by WJZ.

WIP, PHILADELPHIA, PA. (500 METRES)

10:45 a. m.—Morning service, broadcast dreet from Holy Trinity Church, Ritten-louse square, Philadelphia, Rev. Floyd

V. Tomkins, D. D., rector.
4:00 p. m.—Services under the auspices of the Cormantown Y. M. C. A., broad-"The Master Thought," a lecture by Wil-liam Rainey, Bonnett, the man who rought down the house last year.

WJY, NEW YORK CITY

- (405 METRES) TO-DAY. 8:15 p. m.-Bernhard Levitow's Hotel Commodore Concert Orchestra. 10:00 p. m.—"Reminiscences of a Re-orter," William H. Crawford.

WJZ, NEW YORK CITY (466 METRES)

m.-Children's hour: Original stories by the authors, music by the comcomic stories by the originators

of famous comedies.

11:00 a, m.—St. Thomas Episcopal
Church services; sermon by Dr. E. M. 2:30 p. m.—Radio Bible class, under auspices of Greater New York Federation of Churches: "A Coward's Verdict," Rev.

Basil D. Hall; Elsie Kiesewetter, soprano Grace Holone Force, contralto. 8:30 p. m.—Edna Walter, planist. 4:00 p. m.—St. George's Episcopal Church vospor services, Sixteenth street and Stuyvesant square; rector, Dr. Karl Rolland; George W. Keminer, organist

and choirmaster; Mozello Bennett, violinist. 7:00 p. m.—Nathan Abas's Hotel Penn sylvania Orchestra.

8:00 p. m.—"Practical Religion," Dr.

Harry Emerson Fosdick. 8:30 p. m.—"George Washington," by Gen. Oliver B. Bridgeman, of Sons of American Revolution. 8:45 p. m .- Joseph Knecht's Waldorf-Astoria Concert Orchestra; WGY will also

10:00 p. m.—Hampton Institute Quartet. WLS, CHICAGO, ILL.

(845 METRES) 7:30 p. m.—Emerson at Barton organ; special musical programme.

WOO, PHILADELPHIA, PA. (509.9 METRES) 2:30 p. m.—Musical exercises opening he regular Sunday afternoon session of Bethany Sunday school.

0:00 p. m.—Sacrod recital on the Wana-nakor grand organ, Clarence K. Bawden at the console. 7:30 p. m.—Evening services from Bethany Presbyterian Church, Twenty-second and Balnbridge streats, Philadel-

second and Bainfridge stream, Philadelphila. Broadcasting will include an organ recital from 7:30 to 7:45 with Miss Caroline Quigg at the console; sermon by the pastor, Rev. Dr. A. Gordon MacLennan.

WSB, ATLANTA, GA. (420 METRES)

TO-DAY. 12 m .- First Presbyterian Church serv-4:30 p. m.-Christian Science lecture at

Loow's Grand Theatre. 6:00 p. m.—Baptist Tabernacle Church 8:30 p. m -- Wesley Memorial Church

WBZ, SPRINGFIELD (383 METRES.)

TO-DAY.

10:55 a. m.—Church services from the Church of the Unity, Rev. Charles A. Wing, paster. Music by the Philharmonic

Male Quartet; Raymond C. Hodge, first tenor; Howard I. Smith, second tenor; William H. Lippmann, baritone; George

B. Dowd, bass; Robert W. Fleid, organ-lst and director.

3:25 p. m.—Concert by the People's Symphony Orchestra, direct from the St. James Theatre, Boston.

7:00 p. m.—Copley-Plaza Orchestra. under the direction of W. Edward Boylo, Boston:

7:30 p. m.—Edward Botner, baritone, broadcast from Ford Hall, Boston, through Hotel Brunswick.

8:00 p. m.—Broadcast of Ford Hall forum meeting. Address by Mrs. Frank B. Chibreath, "The Effect of Scientific Management on the Worker," through the

Hotel Brunswick, Boston.

10:00 p. m.—Lecture on "Paths of Adventure," Hotel Brunswick, Boston.

WWJ. DETROIT, MICH. (852.7 METRES)

TO-DAY.
7:30 p. m.—Services at St. Paul's Episcopal Cathodral, broadcast from the ca-2:00 p. m .- The Detroit News Orches-

WCTS, WORCESTER, MASS. (268 METRES.)

TO-DAY. 7:20 p. m.—Musical programme by "Roxy and His Gang," direct from the Capitol Theatre, New York city, by courtesy of the Capitol. Theatre management and S. L. Rothafel (Roxy). 9:15 p. m.—Organ recital direct from the chapel of Columbia University, New

WHAS, LOUISVILLE, KY. (400 METRES)

TO-DAY 10:57 a. m .-- Organ music. 11 a. m.—Church service under the auspless of the Calvary Episcopal Church; the Rev. Dr. Harris Mallinekrodt, paster. Lawrence Cook, organist and choir di-

5 p. m .- Organ recital by George Latimer, playing at Christ Church Cathedral.

5:30 p. m.—Choral evensong service at Christ Church Cathedral. The Very Rev. Richard L. McCready, dean; the Rev. Frank W. Hardy, senior canon; the Rev. J. M. Nelson, canon missionary. Ernest Arthur Simon, organist and choirmaster. Men and boys' choir of 00 voices.

WLIT, CHICAGO, ILL. (305 METRES)

TO-DAY 3:00 p. m. to 5:30 p. m.—Specially arranged Sunday concert by the Arcadia Cafe Concert Orchestra, Ferl Sarkozi, di-

m .- Dinner music direct from the Benjamin Franklin Hotel, by the Concert Orchestra, W. Irving Openheim, director. 8:30 p. m.—Bible stories for the chil-"Dream Daddy."

9:00 p. m .- The WLIT Forum, including round table discussions and direct broadcasts of important concerts and mootings, under the auspices of the

KDKA, EAST PITTSBURGH, PA. (809 METRES)

TO-DAY. 10:45 a. m.—Services of the Point Breeze Presbyterian Church, Pittsburgh, Rev. Percival H. Barker, paster 2:00 p. m.—"Mothers' Day," Miss Etta Jarvis, founder of Mothers' Day.

2:30 p. m.—Concert by the Westinghouse Symphony Orchestra, under the direction of Victor Saudek. 4:00 a. m.—Organ recital by Dr. Charles Heinroth, director of music of Carnegic Music Hall, Pittsburgh, broadcast directly from Carnegic Music Hall, Pittsburgh, 6:30 p. m.—Dinner toncert from the Pittsburgh Athletic Association Orchestra

under the direction of Gregorio Scalzo.

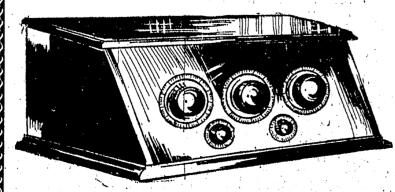
7:45 p. m.-Services of the Sixth Pres-



promission of the promission of the promise of the UNDOUBTEDLY-

THE GREATEST VALUE IN RADIO-TO-DAY

FOR THE FIVE-TUBE



The performance of this Radio amazes us-let us convince. you also. Call, write or telephone. Our Radio men will gladly explain further.

DON'T DELAY DO IT NOW TERMS ARRANGED

M. STEINERT & SONS STEINERT BLDG. 495 WESTMINSTER ST.

The state of the s

byterian Church, Rev. B. F. Farber, pastor.

WHN, NEW YORK.

Department of other stations as rapidly as funds permit. This relatively new

(360 METRES)

TO-DAY. 3:00 p. m.—Queens County Christian Endeavor programme, represented by the Rev. Charles Worner, paster of the Springfield Dock Christian Church. 4:00 p. m.-Manhattan Elks Band, No.

15, direction of Henry Hauminel. 4:30 p. m.—Collegiate Dance Club. 5:00 p. m -- Roseland Dance Orchestra. 5:30 p. m.-Olcott Vail and his string

0:55 p. m.-"How to Recharge a Bat ery in Ten Minutes." 10:00 p. m.—Gem razor entertainers. 10:45 p. m.—Janssen's Hofbrau Comnunders Orchestra. 11:15 p. m.—Vanity Club rovue.

11:45 p. m.—Connie's Inn Revue, 12:15 a. m.—Harry Richman and his ontertainers with Eddle Elkins and his or-

WNAC, BOSTON, MASS. (280 METRES)

11:00 a. m.—Morning service, broadcast from the Cathodral Church of St. Paul.
4:00° p. m.—Broadcast from Boston Square and Compass Club—White's Congest Company

cert Company.

6:45 p. m.—Evening service, broadcast from Park Street Congregational Church.

WGR, BUFFALO,

(319 METRES) TO-DAY. 3:00 p. m.-Vesper services; First Trinity Lutheran Church.
4:00 p. m.—Organ recital, Randolph

represent the United States in the meeting, M. G. Marcuse will represent Britain, M. le Docteur Corret will represent France; M. Henrotay, Belgium; Sr. Balta Maynard, organist.

5:30 p. m.—Organ recital, direct from Ellas, Spain; Sr. Giulio-Salom, Italy; M. Cauderay, Switzerland, and M. De Groot Central Presbyterian Church 7:30 p. m .- Evening service, R. J. Mac Alpine, D. D., minister,

TUBES REPLACE SPARKS

S. Lighthouse Service Reports Success

ful Experiment.
"The value of radio as an aid to navigation, especially as protection against fog, the greatest of all dangers to the mariner, has been further demonstrated during the last year," according to George R. Putnam, Commissioner of Lighthouses, in his annual report to the Secretary of

"The United States Lighthouse Service now has 12 radio fog-signal stations in



VACUUM ARRESTER STANDARD FOR 19 YEARS





\$**50**.00 RECEIVER The new CHELSEA tunes out all local stations regardless of conston. Finished in manograpy with shielded bakelie panel. A REAL VALUE.

On Sale at all good dealers. Catalog on request. CHELSEA RADIO CO.

153 Fifth St., Chelsen, Mass. Hastings Electric Sales Co. actory Sales Agents for N. E.

7 NO DISTORTION DAVEN RESISTANCE COUPLED AMPLIFICATION

ald to navigation has met with great favor

and now having more stations in operation

than all the countries of Europe combined.

oscillator, has been installed, "The total number of alds to navigation operated by the Lighthouse Service at the close of the fiscal year number 17,288, an increrase of 305 over the preceding year. This number included 147 new automatic lights, of which 75 were changed from attending lights."

PLAN RADIO MEET

Amateurs Preparing for International

Conference in March. Amateurs of all countries are preparing

for the great international meeting in March, coincident with the juridicial con-

gress of the international wireless tele-phony committee. Hiram P. Maxim will

will represent Luxemburg.

The delegates form the organization

committee and wil prepare the work of

the meeting and seek the membership of

UNLOADING SALE

DORRANCE

BELL TONE TUBES,

Type 201A........

Every Tube Tested in Your

The Daven Super-Amplifier

is one of Radio Engineering's most prominent. achievements-by its use distortionless amplification i s assured. Con-

densers and all connections are hidden be-neath the molded bakelite heath the molded bakente base. It comes to you com-plete and ready to connect with any tuning system. Each complete unit is labora-tory tested and guaranteed. It can be purchased in all good Radio Stores.

It's full of in

Post Paid

Amplifier Kits for those who build their own—supplied in either 3 or 4 stages without sockets and condensers. Sold everywhere:

DAVEN RADIO CORP. "Resister Specialists New Jersey



Man's Solt Shirt Q or Two Blouses U **WASHED STARCHED IRONED** 10 pounds for \$1.50 All wearing apparel finished by hand.

By far the most economical finished family laundering. You SAVE on every bundle. Send us ALL your family washing and prepare to be really surprised at your saving and pleased with the excellent work. Try us THIS WEEK.

Unit System Laundry Un. SETE W Un. SETS W 145 Globe Street

other nations beside their own in a pro-posed international union of wireless university experimenters explain, the caramateurs.

NEW BROADCASTING METHOD

with mariners, as evidenced by the de-mand for additional installations and the equipment of vessels with radio com-Carrier Wave Silent in System Perfected passes.
The United States leads the world in by WRM. Using a new method which dispenses this form of ald, having been the first to establish, successful radio fog signals

with the carrier wave upon which to im-REPAIRED

System was perfected Nominal charges, Satisfaction guarit is claimed much transmitter noise is eliminated and sharpness of tuning by the receiver is irreased.

Under the double-wave system in the carrier is audible at all the carrier is a carrier is a carrier in the carrier in the carrier is a carrier in the carrier in the carrier in the carrier is a carrier in the carrier in the carrier in the carrier is a carrier in the press the voice wave, station WRM of Canada has also made important progress of the Illinois-Indiana basketball game in radio aids to navigation.

"An important, advance has recently."

The non-carrier system was perfected

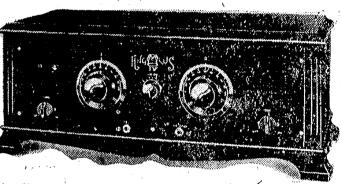
been made in the radio aid to navigation by the introduction of tube transmitters. Brown and C. A. Kessner, and by its use designed to take the place of spark transmitters. After test, one of these was eliminated and sharpness of tuning by installed on Ambrose lightship, and is in the receiver is increased, successful use. On Uantucket lightship Under the double-wave system in use a more powerful submarine signal, the the carrier is audible at all times in oscillator, has been installed.

rier wave goes out only when a note is sounded or a syllable spoken, and between notes or words the carrier wave is silent resulting, it is claimed, in greater distance ind purer reception.

ANY TYPE OF **HEADSETS**

FIRST APPEARANCE IN PROVIDENCE We Announce With Pleasure the New

4-TUBE ANGELUS



This Set is beautiful in appearance and performance. Actual tests in the city bring in following stations with WEAN and WJAR both on:-KDKA WTAS, WSAI, WDZ, WGY, WIP, WJZ, WRC WEAF, WOC, WNYC, WFI, WEDH, WQJ CFCF, CHYC, KFAF.

PRICE \$65.00 TUBES AND BATTERIES EXTRA .

NOW IN STOCK

NEW MAGNAVOX SETS Single Dial Control\$110

With Built-in Speaker\$150.00 TUBES AND BATTERIES EXTRA

NEW FEDERAL SETS Simplified Controls. Perfect Tone and

Reception \$150.00 With Built-in Speaker TUBES AND BATTERIES EXTRA

NEW ATWATER-KENT SET 5-Tubes enclosed cabinet type. Very selective and

TUBES AND BATTERIES EXTRA LOUD SPEAKERS

\$7.50 to \$45.00

Only—Aeme Superheterodyne—Original price \$190,

All Standard Makes in Stock from.

ANY SET DEMONSTRATED IN YOUR HOME WITHOUT OBLIGATION All goods sold on easy payment terms to suit customer's con-

USED AND DEMONSTRATING SETS Federal No. 61—6-Tube— Original price \$221, 1 Only—De Forest D-12— Original price \$161,

Federal No. 59-5-Tube-Complete with Tubes, Batteries Original price \$190, and Built-In Speaker. Federal No. 57-4-Tube-Original price \$150, 1 Only—R. C. A. 3-Tube Set—Original price \$150, \$28 Federal No. 110-3-Tube-Original price \$150,

R. C. A. Tuning and R. F. \$15

1-W. E. Loud Spenker with Power Amplifier and Tubes and Batteries, New value \$79 Kennedy 3-Tube Set— Original price \$95, \$31.50 All above guaranteed in perfect working condition-Tubes and Batteries extra unless otherwise stated. Watch Our Bargain Counters

AND DISCONTINUED ITEMS BELOW COST National Kits for Browning Drake in Stock \$20.00

De Forest Tubes Reduced to \$3.00

Dest on the Market for Dry Cell or Storage Battery

Grebe Synchrophuse - Three Stage Resistance Coupled Amplifler - Cockaday Reflex Super-Heterodyne-Unele Sam Circuit -Roberts Knockout, 15c each.....

LARGEST STOCK OF SETS AND PARTS IN RHODE ISLAND

MANY LINES CONSISTING OF OVERSTOCK

B. & H. Supply Co., Inc.

116 MATHEWSON STREET Phones Gaspee 5550-1-2-3