## Mercury Detector Device May Be Improved by Experimenter

#### Refinements Suggested by Engineer Provide Greater Flexibility and Simplicity.—Battery Current and Signal Strength Changed With Oscillation

experimenters—that vast army the surface of the mercury. who are interested in radio, not so much for its entertainment or educational value,

but rather for radio's sake and for the mental exhibit and alertness which are among the rewards of auch activities. Now a rudimentary radio device may be brought to a state of perfection by at least glass soals are at a red heat. The wirethree different channels: By the inventor mesh grid (B) is attached himself, in atrict secrecy; by follow-up and inserted as in Fig. 1. work carried on by the few who may have been privileged to witness the rudimen-tary invention or by the hundreds of thousands of radio experimenters all working with the determination that such invention

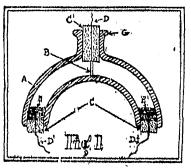
Judging by the results attributable to the radio experimenter in the past, the latter way is by far the speedler method. It is for that reason that this additional ar-"Tuboless Receivers" has been

Readers will remember that in the Sun-day Journal Radio Section of Dec. 28 there was an article about a receiver which operates without crystal or vacuum tubes. The experimental device therein described was a cylindrical glass container, stop-pered at one end and in which was placed a quantity of mercury (sometimes erron-eously called "quickeliver"), a circular

grid and an anodo.

In this device a constant positive potential, derived from "B" batteries, was applied to the anodo, while the mercuity which acted as the cathode was connected in the negative lead of the high voltage supply. When thus connected the device performed the same function as but in a different manner from the familiar threebleotrode vacuum tube now in universal

though the resultant signal strongth is less with the new device than when standard thermionic vacuum tubes are used, the fact that the former entirely eliminated the use of a filament and an "A" battery made it possible consider



Refinement of Tube

INY G. N. GARRISON.

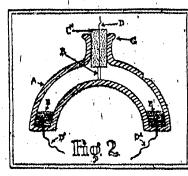
Lanckly radio numbers among its ardent the "B" battery voltage used as well as with the cross-sectional area of tube (A) followers thousands upon thousands of and vertical height of the grid (B) above

(E) and (D1) with the connecting lead wires (D1) and (D2) pass through the end

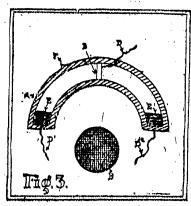
seals of the tube. mesh grid (B) is attached to stopper (C1)

Fig. 3 is an improvement over the devices shown in the drawings in that here the neck (G) and stopper Ci) have been eliminated. The connecting lead wire (D) is now passed through the glass wall of the tube in much the same manner as was the terminals connecting (II) and (III) with (D1) and (D2) of Fig. 2,

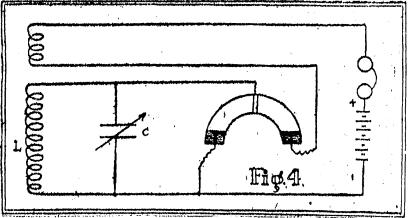
The wire-mesh grid (B) is pushed into place by means of tweezers before either end of the tube is scaled. The mercury is then poured in and the ends scaled



Ends of Tube Sealed



Neck and Stopper Eliminated



## Device Connected to Regenerative Circuit

erably to increase the number of stages of amplication such devices could use. Such a device was by its very nature, rather crude; therefore the following refinements and experiments should prove in-

torosting and instructive.

In Fig 1 is shown the first refinement and in its general shape and action it remains virtually the same in the two drawings following.

Fig. 1, (A) represents the glass tube bent as shown, (B) represents a side or end view of a circular wire-mesh grid disposed in the glass tube (A) as illustrated, (D) shows the connecting lead wire from the wire-mosh grid, while (D1) and (D2) are the connecting lead wires from the cathode and anode.

The letters (E) and (E1) show a quantity of mercury, the action of which, possibly not entirely clear in our former article, will be explained more in detail later. The connecting lead wires (D), (D1) and (D2) pass through cork or some other form of stopper, the stopper (C) having been pushed into the open ends of the tube, while stopper (C1) closes the opening

tube, while stopper (Cl) closes the opening in the neck (Cl).

The wire-mesh grid "B" is preferably made fast to the under side of stopper (Cl) and together with stopper (Cl) is inserted in neck (Cl). This procedure gives greater stability to that element and prevents a certain amount of mechanical vibratory phone noises otherwise present.

If (c. 2 is (doutloal with If (c. 1) with the

vibratory phone noises otherwise present. If g. 2 is identical with Fig. 1 with the exception of the fact that in Fig. 2 both ends of the glass tube are scaled. The illustration shows the ends scaled flat, but this is not necessary, and these ends may be tapered without affecting the operation of the device.

The ends were flattened simply that the fewice might have a surface upon which to stand. It is essential that the mercury in, each "log" of the tube be virtually level

and it is essential that the moreury in each "log" of the tube be virtually level and be of nearly equal height. The quantity of mercury required is best detereach "log" of the tube be virtually level and be of nearly equal height. The quan-

as formerly. The tip (IP) is formed dur ing the operation of exhausting the tube, or filling it with gas, as will be later xplalnod.

The operation of this device is very simiar to that described by the writer in the ssue of Dec. 28. The superiority of the device described in this article over that previously considered is a flexibility and simplicity which permits experimenters more latitude in their work.

In the devices described in this article either (E) or (DI) may act as cathode and the other as anode, depending upon the polarity of the high potential used.

Assume that the device was connected to a standard regenerative circuit, as shown in Fig. 4. The incoming oscillations are applied through (L) and (C) between (B) and (E). Since (E) is con-

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parts \$80.00 \$ Come in and Hear the Set Its Tone Quality Will Please You

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## To-day's Hook-Up



He Would Prefer a Talk on How to Reduce

#### nected to the negative and (E1) to the positive side of our high potential, then Women Head the former will act as the eathode and the latter as the anode. The mercury vapor in endeavoring to pass from (E1) to (E) must pass through (B), which is connected to one end of our oscillating in the U.S. During the half cycle (that our incom-

ing oscillation is negative it will assist the flow of current from the "B" bat the flow of current from the "B" bat-terles, through the phones, tickler, mer-cury vapor and back to "B" batteries. Such assistance will have the effect of 'increasing the "B" battery current when the incoming half cycle is negative. The reason for this is that unlike charges at-tract seach other and in this assumed case (EI) is positive while both (B) and (E) are negative.

During the half eyele that the grid (B) s positive the charge on (111), (B) and (12) tend to neutralize each other, result; ing in an interruption or checking of the "B" battory current. It can be seen that the "B" battery current and therefore the liaphragm pulsations and signal strength are made to vary in accordance with the incoming oscillations. The tickler coll in this circuit is used for the same purpose as that in any three-element vac-uum-tube circuit, that is, to cause reconcration and increased signal strength. In experimenting with these devices it is suggested that at least one each of

the devices shown in Fig. 1, 2 and 3 be built and that the result of experiments thorewith be carefully noted. Fig. 3 is especially adapted for diferent degrees of exhaustion, as well as for the insertion of various gases, tube is "sealed off" at the tip (F). What was said about the operation of the earlier device applies equally here, success or failure depends very largely upon the proper size, proportioning and

placing of the various elements. In any event, in experimenting with the above devices the experimenting with the above devices the experience gained, if it but serves to keep the experimenter off the "beaten path," wil be hours profitably and enjoyably spent. And then, again, you may be the successful experimenter!

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Radio dealers have

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They've tried it side by side with instruments that sell for two and three times

as much. The unan-

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PROVIDENCE, R. I. England Factory Representatives

An amazing value ...

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spicuously good in the service they ren-

There are many women broadcast announcers, but out of the some 550 stations throughout the country only three are known to be run entirely by women. All three, for this reason, have gained popularity in the radio world, says the Milwaukee Journal. Mrs. Pochler, for instance, not only manages her station, but is called upon to write special radio ar-ticles for newspapers and magazines and to deliver lectures to clubs and classes. As head of WLAG, she has complete charge of the programmes and business

arrangements, and she frequently an-nounces her evening concerts. She is a widow, with one son, an accomplished musician and a soprano of European as well as American training.

known for her musical concerts.

Training for this job came to Miss Waller from the field of advertising and office management.

Not only is Miss V. A. L. Jones di-

rector of station KSD, St. Liouis, but she retains her control over her own advertising concern in that city. She is a mu-sician and a critic, graduate of the Uni-versity of California. She announces her

black deckled

enamel horn.

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DYMAC guaranteed products. Ask yours

PRODUCT Everybody says,

#### own programmes, besides managing the business end. All three stations are in Class B and of the highest grade officially. Their di-rectors compete good-naturedly among themselves for highest honors in broad-Radio Stations casting. Yet they have never met.

Because a dry battery is built so that Three women hold the distinction of it can stand more acid at the bottom than anywhere else, it should never be laid upon its side. When on its side the acid will quickly destroy that portion of the zing which is underneath and being broadcast directors in the United States, and all three are said to be conder to the listening public. They are: shorten its life. Eleanor Poehler, who manages station WLAG, Minneapolis; Miss Judith Waller of station WMAQ, Chicago; Miss V. A

L. Jones, station KSD, St. Louis. fås changed in some way.

well as American training.

Miss Waller is, responsible for the operas broadcast through station WMAQ, at Chicago by the Chicago Civic Opera Company. She has planned educational programmes for WMAQ fans and is well

# WJAR HEARD IN

Reception of Local Programmes Reported from Ovearseas.

pplause Cards Also Received from Scotia,-No Fading, Says English

Radio programmes put, on the air in Providence are entertaining listeners from Alaska south to Central America and from the Pacific coast east to Europe, according to the numerous applause cards which have been received recently by station WJAR. Several of the messages from fans in distant places indicate that the signals of the local station have been received with sufficient volume so that the isteners could bring in the programmes for considerable periods of time.

Among cards from the far North is one on which the writer states that his mes sage would be carried 800 miles on a dog sled and then sent by boat to the nearest railroad station, before it could be mailed WJAR has been heard in every province in Canada, and a lotter from J. E. Murdock, Cadlogan, Alberta, states that the Providence civic celebration, broadcast Christmas Eve, came in clearly and with considerable volume in the little town on the Pacific coast, 600 miles from Van-

couver, B. C. , Another communication came from Cen tral America. The writer, Jose Volasco of Santa Ana, 121 Salvador, has this to say about his reception of music from the local station; 'I am taking pleasure to inform you that you station, WJAR was heard here, transmitting dance music. It is quite a pretty distance which separates us, and I thought you would like to know what a long way travel your signals."

From places bordering on both sides of the Atlantic messages acknowledging reception of WIAR signals are frequently received. Within recent weeks Rhode Islanders, as well as people from ather States, who have gone to Florida to es-cape the vagaries of winter weather experjenced in the North, have reported that concerts sent out from this city have been received with good volume on loud speakers. Cards have also been received

#### RADIO CABINETS Made to Order

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PATTERNS AND MODELS 107 Friendship St.

## RADIOLA III.

RADIOLA III, complete with \$40.35 phones, tubes and Burgess Batteries

RADIOLA III, with phones and \$35.00

Dependable Radio Sets Backed by Conscientious and Intelligent Service

## Blanding & Blanding

58 Weybosset St.

## from places north of Nova Scotia, according to James A. Rellly, WJAR studio manager and announcer. Applause cards bearing the postmarks

of various European countries have also reached WJAR this winter. Claude Shephard of Draycott, North Derby, writes that he has heard WJAR signals for an hour at a time without any trace of feding or without losing a single part of the

programme,
A Brown University alumnus, H. C. Wardwell, '98, has notified the station that while in Belgium he tuned in on WJAR one night and heard "Daddy" Jim Coombs, who is also a Brown man, singing one of his well-known selections Polly put the kettle on, and we'll all

take tea."
Basil T. Edwards, a resident of Lakewood, who is chief engineer on the SS. Joseph Seep, has reported that he heard the local station while he was in Italy. He wrote, "I heard you finely all the way from Galveston, Tex., until passing through in Gibraltar, and then picked you up again in the Adriatic. You certainly have good modulation."

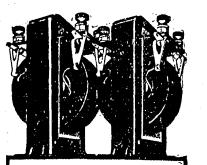
To increase the selectivity of a receiver using a variocoupler with a secondary tuned by a condenser, simply turn the rotor coil so that the turns of the pri-mary are almost at right angles of those on the secondary. Bring the plate variometer up to maximum regeneration

#### Drilling Holes in Glass,

One of the newest and quickest ways to drill holes in glass is to use a brass or copper tube with thin-walls instead of a triangular file. The tube is placed in a brace and drilling is accomplished with powdered carborundum as a cutting agent, A guide of wood keeps the tube properly

#### Importance of Good Aerial,

The direct cause of the comparatively poor results obtained by some of the re-celving sets is the aerial system. Some are improperly placed, some have poor are of a length far from sultable.



## Price

Here is a singular fact. Alfaudio transformers comparable to Amer-Tran cost as much or more.

Seven dollars is not too much to pay for a good audio transformer, and of that group of transformers recognized as good, Amer-Tran is first.

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# RADIOS

## All the Standard Makes

De Forest Crosley

Keep Battery Right Side Up.

To Correct Uneven Phones.

When headphones give off an uneven

und, it means that one of the phones

liaphragm, which is the small metal disc, due to a loose ear cap. Tighten the caps.

mon cause of this trouble is a loose

Malone-Lemmon

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495 Westminster St.

7:80-Church, WGR.

7:45 Church, 'KDKA,' 8:00 Talk, WJZ.
Rocital, WBZ.
8:15 Concept, WJY.

8:30-Church, WFAA.

9:00-Church, KGW.

8:45 Orchestra, WJZ.

Concert, WBZ, 9:30—Orchestra, WIP, 9:45—Church, KOA, 10:00—Concert, KGW,

Concert, KGW,
Concert, WFAA,
Rocital, WJZ,
Talk, WJY,
Specialty, WHN,
10:30—Concert, WFAA,
11:00—Rovin, WHN,
Church, KGO

Church, KGO

11:30—Orchestra, WHN. 12:00—Entertainers, WHN.

Boynton; hynm, Ellesdie; benediction Amen; organ postlude, "Festival March,"

Stocks Sawed for Specials Charte

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TABLES TO ORDER

WOODWORK OF ALL KINDS

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Organ recital, WHAP, Organ recital, WCAP

Organ recital, WDBH.

Forum, KDKA. --Concort, WCCO.

Organ recital, WLS.

## FILAMENT CONTROL JACKS VALUABLE

Automatically, Light Necessary Number of Tubes.

Construction of Device, Which Makes Possible Connection of Proper Points, Explained,---- Basy in Wire Into Set.

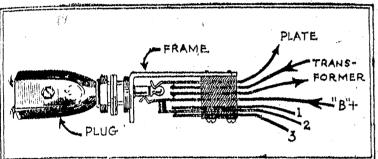
nt, G. C. HBES. if you operate a receiving set excluhooly for your loud-speaker or for your headphones alone, a simple battery-switch

lustrated in the accompanying diagram, the connections to the first four springs are made just in the same manner as when a plain four-spring tack is used. With the plug inserted, the current from the "B" battery enters through enerof the long springs, traverses the phone leads and phones and goes to the plate by way of the other long spring.

seturns from it ever the inner and shorter springs. Let us assume that the jack illustrated is inserted in the detector circuit. With one phone pluggin the jack the phones are connected to the detector. What happens to the filament portion of the circuit while this is going on? As

the plug is pushed into the fack, spring (2) of the filament control section of the jack is brought into contact with spring (3), the necessary pressure being exerted through a small longth of insulating reductioned to one of the plate circuit

the detector tube is lighted.



Filament Control Jack Connections

control Jacks not only parret you to conneet your phones or speaker into the circult at the proper points, but at the same time automatically light the necessary

The flancht-control fack is the same construction as the ordinary phone Jack, it In the case of the double-circuit jack il- lighted.

s closed automatically and two tubes are ightod.

Inasmuch as the "A" battery is always wired to the (8) contact of the filanont jack no tube can be illuminated until the plug is inserted somewhere, and having, however, some extra contact when it is pushed into one of the jacks springs for the "A" battery connections, all the necessary tubes are immediately

rection of Arthur 15. Gonyca assisted by

Mrs. Clonyea. 8:25 p. m.—Mariana M. Tallman, poet-

8:50 p. m.-Mrs. Gertrude Wilcox Har-

rop will give the second of the series of talks on Red Cross work!

0:00 . p. an -- Gypsy Ensomble relayed

TUESDAY.

1:05 p. m .-- Providence Biltmore Hotel

Oronestra direct from the hotel under the lirection of Brwin White.

2400 p. m.—Dr. Worth M. Tippy, Executive Secretary, Federal Council of Churches of Christ in America, will talk on "Federal Child Labor Amendment."

7:45 p. m.—Fern Kingsford, planist. 7:55 p. m.—Speaker from Providence

10:00 a. m.—Housewives' Radio Ex-

from New York bity studios.

## RADIO PROGRAMMES

reador.

Safety Council.

Special musical events and educational talks are featured on the programmes of local broadcasting stations this week, Addresses on the Red Cross, the Child Labor Amendment and music are to be given at WJAR. This station also offers a concert by the United States Army Band and a recital by Mmo, Charlotte Laind, oper atic singer. Wednesday evening. A programme by Clan Mackinley, Order of Scotch Clans, will be relayed from Boston to-morrow night by WEAN, which also offers orchestra and vocal music each day. The Hope Trie and the Fairlawn Entertainers will give a musical programme at WSAD Thursday night. The last in a series of "radio journeys to the homes of great musicians" is scheduled by WDWF Thursday night.

#### WJAR, THE OUTLET COMPANY (800 METRES) TO-DAX

7:20 p. m.—Musical programme by 10:00 a. m.—Housewives' Radio Ex-"Roxy and Ells Gaug' direct from the change. A department conducted by Mrs. Capitol Theatre, New York City, courtesy of the Capitol Theatre management and est. no first part of the programme will be taken direct of the programme will be taken direct from the stage of the theatre and will consist of music by featured artists and the Capitel Grand Orchestra. The second part of the programme will consist of a special presentation by Mr. Rothafel of vocal and instrumental artists direct from the broadcasting studio in the theatre.

9:15 p. m.—Organ recital from the Chapel at Columbia University. MONDAY

10:00 a. m.-Housewives radio exchange. A department conducted by Mrs. Wood on all matters of housened inter-

est. 1:05 p. m.—Theresa Del Rossi, planist. 8:00 p. m.—Programme under the di-

Empire Radio Co. 23 EMPIRE ST.

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DURING OUR FIRST **Anniversary Sale** 



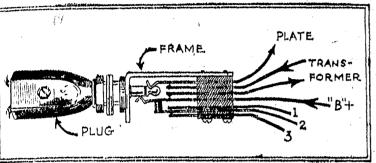
DISTRIBUTORS TO THE TRADE FOR

WHOLESALE ONLY 60 PINE STREET GASPEE 0828-0828 Counciling All Departments

When the plug is withdrawn the our-

rent passes to the audistransformer and

Contact (8) goes to the "A" battery and (2) to the rhoostat of the detector, Hence suffices for turning the filament current on and off. This device is convenient for and (3) are opened and the tube put out. switching the battery current on and off. But, at the same time, contact (1) and



When you have use for both phones and (2) come together. No. 1 is joined to speaker you "plug-in" on the detector the rheestat of the first amplifier tube, so tube, first or second amplifier tubes, or, that as the plug is pushed into the noxt perhaps, to a power amplifier. Fliament lack the battery circuit to both rhoostats

9:00 p. m.—Concert by the Waldorf-Astoria Orchestra direct from the lobby of the hotel, under the direction of Josoph Knocht. 9:45 p. m.—Mime. Charlotte Lund, op-oratic star. Programme: "Puccini Memo-

10:00 p. m. Gladys Allen Trio. 10:15 p. m. Justin Lawrie, tenor. THURSDAY. 1:05 p. m.-Studio programme.

ance music.

FRIDAY 10:00 a. m.—Housewives' Radio Ex-change. A department conducted by Mrs. Wood on all matters of household interest. 1:05 p. m.—Woodstock Orchestra, under

the direction of Martin J. Casey. -7:15 p. m.—Plano "Musik Tawkalog," by Mabel Woolsey. The second of an educational series bespecially arranged for piano students.

7:45 p. m.—Concert by Miss Agnes A. Lafayette, contralto; J. Harold O'Keefe; tenor; Lillian B. Levitre, planist.
8:46 p. m.—Talk. 0:00 p. m.-Orchestra, relayed from New

SATURDAY 1:05 p. m .-- Studio programme.

WEAN, THE SHEPARD STORES

(270 METRES)

10:45 p. m.—Service, broadcast from the Beneficent Congregational Church. 3:30 p. m.—Old South Forum, broadcast from Old South Mooting House, relayed

8:00 p. m.—Overseas Male Quarlet, con-dating of Stanley D. Rogers, Walter L. Rogers, Robert A. Lawder, Ray A. Car-diner, assisted by George Faulkner, plan-18t.

0:00 p. m.—Specialty.

10:00 p. m.—Orchestra under direction of Joseph Knecht:

WEDNIGHDAY.

10:00 p. m.—Service, broadcast from the Mathewson Street Methodist Episcopal Church. Organ prelude, "Andantine in D-Flat," Lemare, hymn, Weston; prayer; chant, "The Lord's Prayer," Gilbert; so-prand solo, "I Will Lay Me Down in Peace," Buck; psalter, Third Sunday Eve-ning;" Gloria Patria, Greatorex; offor-tory anthom, "Peace I Loave with You." 7:30 p. m.-Concort by the United Roberts; Doxology; sermon, Dr. Nehemiah

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PICO PHONES Special..... \$1.67

Strand Theatre Bldg. MONDAY AND TUESDAY SPECIALS Bright Star and Cyclone 45 Volt Large By Batteries. Special .......

SALE ON LOUD SPEAKERS Brandes Table Talkers. \$5.37 

Thorola Loud Speaker. Magnavox Loud Speaker, M-1. \$16.95 

3-Tube Crosley, No. 52. 5-Tube Kaylin Receiver. It's a wonder! 

5-Tube Neutrodyne. \$37.50 11c 8 Volt .... \$1.93 Standard

Sockets ..... COMO SUPER-HET KIT FRESHMAN SET \$87.50. \$59.50 Complete with all accessories at a wonderful offer.

Build Your Own Set:-All parts to build

All parts to build 3-Tube Ambassader, the wonder of the \$16.75 Kit complete Neutrodyne. \$29.50 All parts to build Fresh-man Masterplece, includ-ing Genuise \$26.45 \$18.95 All parts to build, improved Haynes \$9.45

New Acmer - Kitsets | If it's anything in Radio. in steck. At the lewest prices, see us before you part Mail orders well attended to send with your money. It will mean a saving to you.

A Liberty Sales Slip Is Your Guarantee. No Sale Is Final Unless You Are Satisfied.

## 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 proframme being given under the regular ligting of announcements.

The hours are based on Bastorn Standard Time.

LOCAL STATIONS 4:45-Vespers, KDKA. 10:00-Chimbs, WDWF, 5:00—Orchestra, WHN. 5:30—Trio, WHN. 0:00—Recital, WOO. 10:45—Church, WEAN, 3:30—Forum, WEAN, 6:00-Recital, WDWF. 7:20-Concert, WJAR. 7:80-Church, WHAN. Concort, KGW.

0:15-Concert, KDKA. 0:80-Concert, WCAD 0 15 Organ rockal, WJAR. OUT-OF-TOWN STATIONS Orchestra, KGO. 7:00—Orchestra, WJZ. Religious service, KYW 9:00-Children's hour, WJZ. Bible class, WFAA. Orchestra, WBZ.

10:00—Chimes, WREO. 10:80—Church, WREO. Church, WOO. 7:15-Organ recital, WGR. Church, WIP. 10:40-Church, WCAD. 7:20-Concert. WDAF. Church WBZ. Concert, WCAP. 11:00-Church, WJZ. Church, WCCO. Concert, WEEL, Concert, WDBH, WCAP. Church, WCCO.

Church, KDKA, 12:00—Church, KYW. 12:45—Concort, WJZ. 1:00—Church, KOA. 1:30—Church, KGW.

2:00—Church, KGW.
2:00—Church, KGO.
Orchestra, WDAR.
Hymns, WEAF.
2:30—Bible class, WJZ.
Concert, KDKA.
Music, WOO.
RASS-Balgious, worder 2:45—Religious service, WEAF. 3:00—Religious service, WHN. Church, WCAE, Vespers, WGR.

8:25---Orchestra. WBZ. 3:80—Talk, WJZ.
Musicale, WGBS.
3:45-Mon's conforence, WDAF. Man's conference, WHELL 4:00-Organ recital, KDKA.

Concert, KYW. Talk, WIP. Church, WCAF. Orchostra, WFAA. Recital, WGR. Rocital, WCAE. Vespers, WJZ. 4:10-Church, WCCO.

States Army Band, under the direction

Warrant Officer William J. Stannard firect from Washington, D. C.

8:30 p. m .- The Three Peasants, Sleillan

4:35 p. in.—Colonial Dance Orchestra. 8:00 p. m.—Scottish Night, Clan Mac Kinley, Order of Scotch Clans, relayed from Boston, TUESDAY. 10:00 a. m. Message to housewives by Miss Chadys J. L. Peckham.

11:55 a. m.—Time signals.

12:00 p. m.—Colonial Concert Orchestra.

12:10 p. m.—Weather report.

12:15 p. m.—Musical programme.

4:00 p. m.-Colonial Dance Orchestra. 4:10 p. m.—Incidental music by Enhery Theatre: Concert Orchestra, William J. Funcher, director.
4:30 p. m.—Weather report.

4:35 p. m.—Colonial Dance Orchestra. 6:30 p. m.—Colonial Dance Orchestra. Harold Sheffers, director; soprano solos by Elizaboth M. Dussault; plano solos and readugs by Lois A. Dussault: vocal solos by Irving Crocker.

m .- Talk, "Thrift in Homes, 7:00 p. m.—Talk, by Dorls B. Datson. 8:10 p. m.-Orchestra and Robert Isensee, baritone soloist, relayed from Bos-

11:30 p. m .- Programme by artists who will appear at the theatrical employes ball, relayed from Boston.
WEDNESDAY.

11:55 a, m.—Pimo signals. 12:00 p, m.—Colonial Concert Orchestra. 12:10 p, m.—Weather report. 12:15 p. m.—Musical programme.

4:00 p. m.—Musicar programme.
4:00 p. m.—Organ recital by Prof. Edward Benedlet.
4:30 p. m.—Weather report.
4:35 p. m.—Colopial Dance Orchestra.
8:00 p. m.—Sixth annual dinner and reception to National Commander James A. Drain, relayed from Boston.

10:45 p. m.—Organ recital by Prof. Edward Benedict.
THURSDAY
10:00 a. m.—Message to Housewives by Miss Gladys J. I. Peckham, 11:55 a. 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 Danco Orchestra.

0:30 p. m.—Dinner dance. Solos by Frank Bernier, Alice Murray and Mary FRIDAY LT 11:55 a, m.—Time signals. 12:00 m.—Colonial Dance Orchestra.

12:10 p. m.—Weather report. 12:16 p. m.—Musichl programme 4:00 p. m .- Organ recital by Prof. Edvard Benedict.
4:15 p. m.—Colonial Dance Orchestra.

11:55 a. m.—Time signals.
12:00 p. m.—Coloniel Concert Orchestra.
12:10 p. m.—Weather report.
12:15 p. m.—Musical programme. 4:30 p. m.—Weather report. 4:35 p. m.—Talk, "Book Brevities," by 4:00 p. m.—Musical programme.
4:00 p. m.—Organ recital by Prof., Edward Benedict, broadcast from Emery's Majestic Theatre.
4:15 p. m.—Colonial Dance Orchestra.
4:30 p. m.—Weather report.



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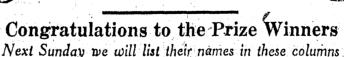
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member of the Providence Public brary. 8:00 p. m.-Concert programme

10:00 p. m.—Cohosit programmer.

10:00 p. m.—Emory Theatre Orchestra.

8ATURDAY

10:00 a. m.—Message to Housowives by
Miss Gladys J. L. Peckham.

11:55 a. 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. 4:85 p. m.-Colonial Dance Orchestra. 4:45 p. m.-Recital by Prof. Edward

8:00 p. m.—Marion Chase Players, re-layed from Boston.

10:00 p. m.—Copley Plaza Orchestra, direction of W. Edward Boyle, popular songs, Rogers and Rogers, relayed from

WSAD, FOSTERS (256 METRES)

MONDAY. A 2:30 p. im.—Instrumental music.
6:00 p. m.—Radio Pals story by Fosters Story Lady.
6:15 p. m.—Regular Monday evening programme of "Dance Hits of Other Days" by the WSAD Orchestra.

TUESDAY, 2:30 p. m.-Afternoon of music. 6:00 p. m.—Fosters Story Lady will talk to her Radio Pals: 6:15 p. m.-Fifteen minutes of music.

WEDNESDAY. 2:30 p. m.-Instrumental music. 6:00 p. m.-Regular weekly Radio Pals entertainment by Fosters Story Lady, assisted in songs and dialog by Dolly Gibb, plane accompaniment by Marion Tanner.

THURSDAY. 2:30 p. m.-Instrumental music.

Nightingale Orchestra.

3:15 p. m.—Song recital by Charles Morgan, tenor of Bristol, accompanied by Miss Frances M. Ostiguy.

8:15 p. m. Concert by Al Thornton'

3:30 p. m.—Instrumental music.
8:30 p. m.—Instrumental music.
8:30 p. m.—Musical evening by the
Hope Trio; Hope Hammett, violin; Victoria Johnson, 'cello; Miriam Stafford,
plano. Programme will consist of en-Continued on Page Eight

## Stand By One Minute

THE 1925 issue of the Providence Journal Almanac contains a list of nearly all of the stations in the United States and foreign countries. It is arranged alphabetically by call numbers. The abbreviations used are as follows: W. P., watt power of station; W. L., wave length in metres; K. C., frequencies in kilocycles.

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WJAR Broadcasting Station

**\_\_\_\_\_** 

## RADIO PROGRAMMES

Continued from Page Seven

Somble and role numbers. The Fairlawn lette Association, Pittsburgh Athletic Association, Pittsburgh.

7:46, p. m.—Services of the Calvary letters, Jimmy Cotton, second tener; George Piggott, bass; Thornton Gill, barlone, and accompanist; Miss Alice Spotwood, reader.

10:00 p. m.—Open forum from the East wood, reader.

10:00 p. m.—Open forum from the East lend Christian Church, Rev. John Ray

#### PRIDAY.

2:80 p. m.—Afternoon of music.
6:00 p. m.—Safety talk for children by Posters Story Lady in co-operation with Providence Safety Council. 0:05 p. m -Stories for the Radio Pals

by Posters Story Lady. 6:15 p. m.-Musical programme to be

SATURDAY. 2:30 p. m.—Saturday afternoon dance music by the Sunset Orchestra.
0:00 p. m.—Saturday night story for the Radio Pals by Fosters Story Lady, 6:15 p. m.—Regular Saturday evening

#### dance nittsle by Lar Potter's Orchestra. WDWF, DUTEE WILCOX

#### FLINT, INC. (880 METRES)

10:00 a .m.—Chimos.

5:00 p. m.-Concert, Venetian Sera-nadors and John J. Fitzpatrick, organist. WEDNESDAY.

9:80 p. m.-Arcadia orchestra.

THUISDAY.

8:00 p. m.—Third, and last, radio journey to the homes of great musicians; subject, "Liszt," This will be followed by a talk, "The Holy Year at Home," by Prof. John F. Greene of Brown University.

#### WBZ, SPRINGFIELD, MASS. (827 METRES)

10:45 a. m.—Church services transmitted from the Church of the Unity. Rev. Charles A. Wing, pastor. Music by the Philharmonic Male Quartet: Raymond C. Hodgo, first tenor; Howard I. Smith, second tonor; William II. Lippmann, tone; George B. Dowd, bass; Robert W.

Field, organist and director.

8:00 p. m.—Programme to be announced. 0:15 p. m.—Concert by the Steinert Quartet broadcast from the Steinert Organ

## WDBH, WORCESTER, MASS.

(208 METRES) 7:20 p. m.—Samo as WJAR.

9:15 p. m.—Samo as WJAR.

#### WHN, NEW YORK CITY (800 METRES.)

3:00 p. m.—Quoens County Christian En deavor programme, represented by the Rev. George Drew Egbert of the Flushing Congregational Church.

5:00 p. m.—Roseland Dance Orchestra.

5:30 p. m.—Olcott Vall and his string

trio, 10:00 p. ni.—Entertainers.

(1:00 p. m.—Vanity Club revue, 11:30 p. m.—Connie's Inn revue, featur-ing Leroy Smith's Orchestra. 12:00 midnight-Club Richman rovue foaturing Harry Richman and his enter-tainers with Eddio Elkins and his or-

12:30 a. m.-El Fey revue.

#### WNAC, NEW YORK CITY (520 METRES.)

TO-DAY.

9:00 p. m.—Programme from the Brook-tyn Mark Strand Theatre under the di-rection of Edward L. Hyman.

## KDKA, EAST PITTSBURGH, PA.

(300 METRES.)
TO-DAY.
It:00 a. m.—Services of the First Presylerian Church, Pittsburgh, Rev. J.

byterian Church, Pittsburgh, Rev. J.
Alvin Orr, pastor.
2:30 p. m.—Concort.
4:00 p. m.—Concort.
1:00 p. m.—Organ recital by Dr. Charles
Richroth, director of music of Carnegio
Institute, Pittsburgh, broadcast directly
from Carnegio Music Rell, Pittsburgh,
4:45 p. m.—Vesper services of the
Shadyside Presbyterian Church, Pittsburgh Tay Hugh (Phomson Repr. pastor. burgh, Rev. Hugh Thomson Kerr, pastor. 0:15 p. m.—Dinner concert by Scalze's

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#### KGO, OAKLAND, CAL. (812 METRES)

TO-DAY.

2:00 p. m.—Service of the First Church
of Christ, Scientist, San Francisco.
0:30 p. m.—KCO Little Symphony Orchestra concert, Carl Rhodehamel conducting, assisted by guest artists.

11:00 p. m.—Service of the First Church
of Christ, Scientist, San Francisco.

#### KGW, PORTLAND, OR. (402 METRES)

1:30 p. m.—Service from First Rresbyterian Church, Dr. Harold Leonard Bowman, pastor.
6:00 p. m.—Municipal concert.
0:00 p. m.—Church services provided by
the Portland Council of Churches.
10:00 p. m.—Dhand concert by Colburn 10:00 p. m.—Dinner concert by Colburn Concert Orchestra of Hotel Portland; intermission solos.

#### KOA, DENVER, COL. (328 METRES)

TO-DAY, 1:00 p. m.—Service of the First Baptist Church, Denver; Dr. A. H. C. Morse, pastor.
0:45 p.m.—Service of the Pirst Baptist

Church, Denver; Dr. A. H. C. Morse, pas-

#### KYW, CHICAGO, ILL. (686 METRES

TO-DAY

12:00 noon—Contral Church service broadcast from Orchestra Hall, Chicago, Dr. F. F. Shannon, pastor, 4:00 to 5:00 p. m.—Studio concort.

7:00 p. m.—Chicago, Sunday Evening Club service. The musical programme will Field, organist and director.

3:25 p. m.—Broadcast from the St.

James Theatre of the concert by the Copley-Plaza Orchestra under the direction of W. Edward Boyle.

7:00 p. m.—Concert by the Copley-Plaza Orchestra under the direction of W. Edward Boyle.

#### WCAE, PITTSBURGH, PA. (402 METRES) TO-DAY

10:45 a, m. Services from Rodef Shalom 3:00 p. m .- People's Radio church serv-

loes.
4:00 p. m.—Piano recital by Prof. Otto Kaltels. 6:30 p, m.—Dinner concert transmitted from William Penn Hotel.

#### WCAP, WASHINGTON, D. C. (469 METRES)

TO-DAY: m .- Service from the All Souls Church, Unitarian, of Washington. Dr. Ulyssos G. B. Plorce, pastor, will deliver the sermon, his subject being "Beyond the Strife of Tongues." Musical numbers will be rendered by Gretchen Hood; sot prano; Charles Trowbridge Tittman, bass; Richard Lorleberg, collo, and Lewis Corning Atwater on the Green memorial organ

4:00 p. m. - Service at Bethlehem Chape of the National Episcopal Cathedral at Mt. St. Alban, Washington, The Rt. Rev. James E. Freeman, bishop of Washington, will deliver the sermon.
7:20 p. m.—Same as WJAR.

9:15 p. m.—Same as WJAR.

#### WCCO, MINNEAPOLIS-ST. PAUL (417 MISTRICS)

11:00 a. m.-Westminster Presbyterian Church, Minneapolis, Rev. J. E. Bushnell, 4:10 p. m.-House of Hope Presbyterian



9:15 p. m. Clasiscal programme.

#### WDAR, PHILADELPHIA, PA. (895 METRES.)

2:00 p. m.—Arcadia Concert Orchestra.

#### WEAF, NEW YORK CITY. (493 METRES.) TO-DAY. 2:00 p. nr.— Sunday Hymn Sing," auspices Greater New York Federation, of

Churches. 2:45 p. m. Interdenominational serv-2:45 p. m.—Interdenominational services, auspices Greater New York Federation of Churches, Address by Rev. John L. Davis, pastor of Grace Methodist Innscopal Church, New York city. Music by Federation Radio Group, Aida Brass Quartet, Federation Male Quartet, with Arthun Billilings Hunt, Banthan and wind Arthur Billings Hunt, baritone, and musi-cal director; Mildred Bryars, contraite Louis Caton, tenor; George Vause, pianist; Frank Penney, violinist, and William H. Brewster, organist.

pain H. Brewster, organist.

\$145 p. m.—Men's conference in the Bedford Branch Y. M. C. A., Brooklyn, N. Y.
Address by Dr. S. Parkes Cadman, "The
Eternal City—Rome." Answers to questions by Dr. Cadman follow the address. Special runsic, Gloria Trumpeters. Howard Wade Kimsey, song leader; Mrs. Howard Wade Kimsey, accompanist; George Betts, chime soloist

7:20 p. m.—Same as WJAR. 9:15 p. m.—Same as WJAR.

#### WEEI, BOSTON, MASS. (405 METRES.)

TO-DAY, 7:20 p. m.-Same as WJAR.

#### WFAA, DALLAS, TEX. (476 METRES.)

TO-DAY, 4:00 p. m.—Grand Symphony Orchestra the Palace Theatre, Nicholas Mirskey di-

7:00 p. m.—Radio Bible class, Dr. William M. Anderson, pastor of the First Presbyterian Church, teacher; Bible study and gospel song. 8:30 p. m.—Service at the First Metho dist Episcopal Church, South, Dr. Carl C. Gregory, pastor.

10:00 p. m.—Dr. Robert A. Hunt, pastor of the First Methodist Episcopal Church, in sacred song recital, with his musical 10:30 p. m .- Jack Gardner and his or

chestra in popular music recital.

#### WGBS, NEW YORK CITY (316 METRES.)

8:30 p. m.-Matinee Musicale.

#### WGR, BUFFALO, N. Y. (819 METRES)

TO-DAY 8:00 p. m.—Vesper services, Second United Presbyterian Church. 4:00 p. m. Organ recital, George Albert Bouchard.

7:15 p. m.—Pre-service organ recital, direct from Central Presbyterian Church, William Wall Whiddit, organist. 7:30 p. m.—Evening service, direct from Central Presbyterian Church, B. J. Mac-Alpine, D. D., minister.

#### WIP, PHILADELPHIA, PA., (500 METRES)

TO-DAY 4:00 p. m.—Services, under the auspices of the Germantown Y. M. C. A. "The





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house square, Philadelphia, Rev. Floyd W. Tomkins, D. D., rector. 0:30 p. m.—Ben Stad and his WIP Sym-Orchestra, with Karl Bonawitz at

#### WJY, NEW YORK CITY, (405 METRES)

TO-DAY

8:15 p. m.—Bernhald Levitow's Hotel
Commodore Orchestra.

10:00 p. m.—"Reminiscences of a Reporter," William H. Crawford.

#### WJZ, NEW YORK CITY (455 METRES.)

10:00 a. m.—Children's Hour. Original stories by authors, music by composers, coinio storios by originators of famous 11:00 a, m.-West End Presbyterian

Church service; sermon by Dr. A. H. Klegwin. 12:45 p. m.—Sunday Symphonic Society Concert direct from Cohan Theatre, 2:30 p. m.—Radio Bible Class, auspices Greater New York Federation of Church-

es; Church Community Chorus, under direction of Clarence, W. Allen; Rev. F. N. 3:30 p. m;-"Practical Religion," Rev.

Harry Emerson Fosdlek, 4:00 p. m.—St. George's Episcopal Church Vesper Service: Rector, Dr. Karl Church Vesper Service; Rector, Dr. Karl Rolland; organist and chorrmaster, G. W Kemmer; sploists, Rejecca. Pharo, soprano; Miss Mozello Bennett, violinist; Harry, T. Burleigh, baritone.

7:00 p. m.—Nathan Abas's Hotel Pennsylvania, Orchestra.

8:00 p. m.—Sharo With Others Day: "The Other Fellow's Share," by Dr. Ernost M. Silves.

est M. Stires. 8:10 p. m. Gotham National Bank

8:45 p. m.—Joseph Knecht's Waldorf Astoria Orchestra; WGY will also broad-10:00 p. m.—Humpton Institute Quartet. WGY will also broadcast,

WLS, CHICAGO, ILL. (845 METRES.)

7:30 p. m.Organ recital. WOO, PHILADELPHIA, PA. (509.0 METRES) .

TO-DAY

10:80 p. m.—Morning services from
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TO-DAY 10:00 a. m.—Chimes from the Belfry, Plymouth Congregational Church, 10:30 a. m.—Services from First Presbyterian Church, Rev. Guy W. Simon, pastor; Dwight Steere, organist.

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Church, St. Paul, Rev. H. C. Swearingen, Powder and the Match, Lecture by the Botton, D. D., pastor.

7:20 p. m.—Second Church of Christ, Paul, Rev. H. C. Swearingen, Powder and the Match, Lecture by the Bethany Sunday afternoon session of the naval high-power transmitting stations, caused interference in reception of alone more than doubles the communication programmes in their immediate the first from Holy Trinity Church, Ritten-organic vicinity, These stations were constructed bounds against Philadelphin, Rev. Wood organ by Clarence E. Bardier. at great expense, and money is not available to replace them at once with more modern equipment. An extended study of such interference is being made to find means of removing this objectionable feature without excessive cost to the Gov-

Apparatus reducing excessive losses on board ships has been developed and it has been found that such apparatus also has an important application to shore sta-tions, as it permits increasing the number of antennae available without corresponding increase in expensive radio towers. A means of multiple reception on a single antenna has been worked out, and trial in service installations show that vessels were able to receive several mesages simultaneously over a single antenna, at the same time permitting tube transmitting on most frequencies with-

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