# RADIO LORE FOR NOVICE AND EXPERIENCED FAN

### Indoor Aerials Solve Problem of Many Landlords' Objections

#### Crude Workmanship on Average Cutdoor Structure Makes It Undesirable.—Loop Antenna Set Satisfactory If Made Correctly

around town and look over the roofs. Did you ever see such a disgraceful mess of wires in your life? It's a lucky thing that the telephone and electric

light companies do not employ radio fans to string their wires. If they did we would be without lights or telephone service most of the time.

We venture to state that out of the thousands of radio aerials gracing (?) the roofs of most cities there are not a dozen which are put up in a workman-like manner. There are probably less than a dozen which have straight poles supporting the wires, and when you get right down to it, can you blame some of

the landlords for not permitting radio aerials on the roof? whole outfit inside of the apartment, with the fourth control which would within the bounds of reason in so far within the bounds of reason in so far as building and operating costs are connegative leads of each of the filament cerned. Furthermore, it's not a complicated set and if you have done any radio building at allyou should not have any difficulty in making this one. It's just the same thing as any other tuned radio frequency set with one more tube added to make it sufficiently sensitive to operate from the loop. Then the detector is made regenerative to help matters along a little, and the whole three coils, Let, o and o, all others thing is kept in a stable condition by a potentiometer. It's really not such a covered wire. The secondaries are on difficult proposition after all, you see. the same tubes, one-quarter of an inch

On this page you will see a schematic

set and the loop inside of your abode. The writer once had a loop set inside of which is connected to a small knob of a certain big apartment house and it absolutely refused to work despite the fact that we could actually see the transmitting aerials of two of the local tiometer holds at the other end. broadcasters. Try as we might, the set would not perk's until it was placed in a corner of the living room where the inches long and seven inches high. A

lost its directional powers even then. This is put in here just to let you length. This is necessary to make the know what you may expect if you hap-

board, slip the loop over the nall into the hole that you have just drilled. This will permit you to turn the loop in different directions, because in most cases the loop must be pointing at the broadcasting station in order to pick up the signal. Another and simpler way of accomplishing the same thing is to put a loop may be suspended above the set. using a piece of wire or cord between the two screw eyes you may swing the loop in any direction.

Of course, the two ends of the wire on the loop may be brought out to binding the lower of the four strips and nexible leads run from here to the set

This loop antenna is tuned by the first time, find the proper balance for the condenser, C-1, which is the ordinary two controls and for all-ordinary work they may remain untouched. Of course, From here, the signal passes if you are going to skip around a lot

Loop

Aerial

n diam

Figure 1

There are landlords—and landlords.

There are radio sets—and radio sets. Some of the landlords and some L-1. The secondary of this is tuned by of the radio receivers do not get along the first section of the two-gang convenience. well together, especially if that radio denser, C-2 and C-3. The other half of set happens to require an outside aerial. You know, one can hardly blame the frequency transformer, and from thence landlords, though. Just take a trip we go into the detector circuit which is made regenerative by the tickler coil. L-7. The rest of the circuit is the ordinary two-stage audio amplifier. Of

course, if you wish you may use re-sistance coupled amplifiers here, but if you do it will probably be necessary to use one more tube in this end of the The whole secret of the set lies in the

two colls L-1, L-2 and L-3, L-4. These colls must be identical. This means that the two primaries, L-1 and L-3, must be the same and the two secondaries L-2 and L-4 must also be the same. Unless this is done the set will not work properly, if at all.

The reason for this careful construc-

tion is due to the fact that the con-densers which tune these coils are on a To those radio fans unfortunate enough to live in apartments where such of rotary plates on the same shaft and two sets of stationary plates on the set of stationary plates on the sets of stationary plates on the sets of stationary plates on the set of stationary plates on the sets of stationary plates on the sets of stationary plates on the cheer up—there is hope. The answer is necessary were we to use separate cona loop antenna set which is half way densers.

wires and the grid returns of the first three condensers are wired to the arm of a 400-ohm potentiometer which is placed across the A battery wiring.

Ordinaris commercially made colls
may be used throughout, but for the benefit of those who prefer to "roll their own" it is necessary to give the detector is made regenerative to help data on these. The primaries of all matters along a little, and the whole three coils, L-1, 3 and 5, are composed there is not the condition by a

On this page you will see a schematic wiring diagram from which you should be able to make the set easily, but beforms should be five inches and they wiring diagram from which you should be able to make the set easily, but before you do a single thing, read on and learn the fine points and the little things that you must watch—for what radio set has no kinks which must be ironed set has no kinks which must be ironed by the regenerative unit and it contains a the regenerative unit and it contains a out in order to make it work properly? the regenerative unit and it contains a Before going into the actual construction of the set we would point out just of from 1 to 15 turns of the same size one thing. That is the location of the wire. This coil, of course, is arranged set and the loop inside of your abode. on a non-magnetic shaft, the outer end

a corner of the living room where the inches long and seven inches high. A substantial was directly in line with used, which was screwed directly to the That building was made of steel and lower end of the panel. The wiring used the rooms were lined with metal lath, is flexible, stranded copper, run mostly in the radio set was completely screened and when we did get it working it was All of the leads in R. F. 1. and R. F. 2 because we were receiving through the were made as short as possible, and for windows. The loop aerial completely each tube the wires carrying the higher lost its directional powers even then.

pen to live in one of those big steel.

The use of a gang condenser, such as freproof buildings.

Let us start in at the left-hand side of free to the leads of these two of figure 1 and go right across it. The units identical. If they are off a little first thing that strikes the eye is the condensers would, if they were two queer-looking square in the upper left- separate units, have different dial readqueer-looking square in the upper lefthand corner. This represents the loop
serial and it is made by building up a
cross or "X" of wood, which, when finished, will be 27 inches across each leg.
You may wind the wire spirally, if
you wish, or better yet, by securing
four small pieces of hard rubber or
bakelite and making 16 saw cuts in their
edges. By securing these strips to the ends of each cross piece to form a T course, one way of getting around this with the wood, you will be able to wind is to use a small vernier condenser the wire on in almost no time at all across one of the condensers, but we The wire may be almost anything. We might just as well use another fullused No. 22 double cotton covered, and sized condenser, for it defeats the very

It worked as well as any other size.

By placing this loop so that it is upright you may mount it on a wooden base. Drill a hole up into the lower part of one of the legs, and, after driving a heavy nail up through/the baseboard, slip the loop over the nail into the

This is accomplished through making another inductance just the same as the others already described, and connecting the secondary of this coil across the two binding posts where the loop is at present connected. The two primary screw eye in the end of one of the legs by the way, are simply connected to the aerial and ground, respectively. Such an arrangement as this may give you slightly better distance, but it will make practically no difference in receiving the

local stations.

In operating such a set as this you may at first find that it is unstable. This may be due to the wrong setting of the much regeneration. You will, after a

Eshaft

R-7

C-1:C-4 -. goo5 mf. variable condensers

C-2,-C-3 - 17005 mf. on common shaft

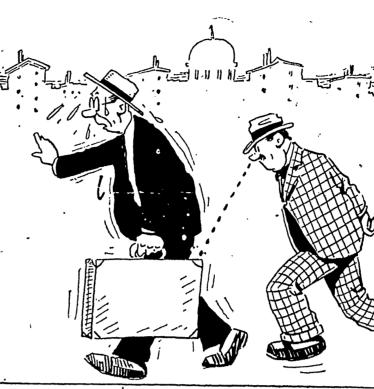
.c-5 - Dessmf. grid condenser

R-1,2,3,4,5,6 automatic rheostats

R-7 - 400 ohm potentiometer

## SHORT CIRCUITS









only the potentiometer will need adjust

the loop and not an inductance. If you are lucky enough to hit just the proper inductance in the loop, this, too, should read the same. However, the chances of having this happen are rather remote. You will find that this set will tune extremely sharp, due to the extra stage of radio-frequency amplification and also to the use of the loop aerial. No neutralizing condensers are necessary with the control as outlined, and once you get the hang of the set you will find that it will give exceptionally fine reproduc-

tion without undue difficulty in tuning Such a set would make a fine portable if dry cell tubes were used and the verall size reduced in proportion. Battery Readings.

When it is inconvenient to use a sydrometer take a reading of the "A" battery with a low voltage voltmeter, This should read 6.6 volts when full. Friday and Saturday will be deve The battery needs charging when the regular entertainers and dance voltmeter reads as low as 5.4.

Use Soldering Flux Carefully. Never let soldering flux get on the erminals of the telephone jack. As soon as this material gets hot it will run in through the fibre insulation and cause leakages at this point.

1-1,2; L-3,4 - radio frequency transformers

A.F.T Z

AF.2

Jack

R.8 - 2-4 megohm grid.leak.

1,5,6,7- hree circuit tuner

& I.7

## RADIO PROGRAMMES

There are three main tuning dials, and each of these should be acrewed to the broadcasting of the Capitol Theatre shaft so that the 100 mark is at the top when all the rotary plates are in mesh the Goldman band concert at 2:15. Towith the stationary ones. By doing this morrow's new feature will be two concarefully you will find that the second certs by the Merrimac Entertainers, a and third dials read just about alike jazz band, and the opera, "Martha," at dial will be off a little because it tunes Shirley Harrington will be Tuesday's special number at 8:05 p. m. For Wednesday, in addition to regular WJAR entertainers. Ed Parent's dance orchestra will be heard at 9:05 p. m., followed by "The Grand Duchess," a light opera-Another talk by Charles E. Price, secof Rhode Island, is scheduled for Thursday at 8:20 p. m., and a big Scotch pro gramme will go on the air at 8:25 p. m. degular artists will be heard Friday

nd Saturday. WEAN, opens the week with broadcasting of this morning's service of the Cathedral Church of St. Paul, Boston, at 10:55, and an organ recital at 7:30 p. m. To-morrow will be devoted to the regular WEAN artists. Tuesday's specialty will be a popular programme by John Fitzpatrick, organist. At 4:00 p. m. Wednesday, a radio playlet will go on the air at 8:30 p. m. Thursday, Friday and Saturday will be devoted to grammes relayed from noted New Eng-

WLSI will broadcast programmes to errow and Friday nights. WJAR-THE OUTLET COMPANY-185

To-day.

To-day.

7:20 p. m.- Musical programme by Major Edward Howe and the Capital Theatre Family.

9:15 p. m.—Goldman band concert, Edwin Franko Goldman, conducting direct from the Mall in Central Park; New York, Emily Day, soprano soloist.

from the Mall in Central Park; New York. Emily Day, soprano soloist.

MODDAY

20 a. m.—Housewives Radio Exchange. A department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be an awered by radio.

51 p. m.—Studio programme by William J. McKenna, bartione, Arthur Gonyea, bass, Cecelia Moreah, planist; Alice McHugh Coughlin, reader.

10 p. m.—Weather report.

10 p. m.—Bassball scores.

11 p. m.—Bassball scores.

12 p. m.—The, Merrimac Entertainers, consisting of Roger Kennedy, mandolin; Eugene Desroches, Spanish guitar; Howard Taylor, tenor guitar and hanjo; Wilfred Taylor, tripple.

10 p. m.—Caesar Sowayeck and Palisade Orchestra.

11 p. m.—Meather report.

12 p. m.—Weather report.

13 p. m.—Weather report.

13 p. m.—Weather report.

14 p. m.—Metropolitan Grand Orchestra.

15 p. m.—Metropolitan Grand Orchestra.

16 p. m.—Weather report.

17 p. m.—Metropolitan Grand Orchestra.

18 p. m.—Bassball scores.

19 p. m.—Weather report.

10 p. m.—Weather report.

10 p. m.—Weather report.

11 p. m.—Musical programme.

12 p. m.—Weather report.

13 p. m.—Musical programme.

14 p. m.—Musical programme.

15 p. m.—Musical programme.

16 p. m.—Weather report.

17 p. m.—Musical programme.

18 p. m.—Bassball scores.

18 p. m.—Bassball scores.

19 p. m.—Musical programme.

19 p. m.—Musical programme.

19 p. m.—Weather report.

10 p. m.—Weather report.

10 p. m.—Weather report.

10 p. m.—Weather report.

11 p. m.—Musical programme.

12 p. m.—Musical programme.

13 p. m.—Musical programme.

14 p. m.—Studio programme.

15 p. m.—Musical programme.

16 p. m.—Weather report.

17 p. m.—Weather report.

18 p. m.—Bassball scores.

18 p. m.—Bassball scores.

18 p. m.—Bassball scores.

19 p. m.—Weather report.

19 p. m.—Weather report.

19 p. m.—Weather report.

19 p. m.—Weather report.

19 p. m.—Musical programme.

19 p. m.—Musical programme.

19 p. m.—Musical programme.

19 p. m.—Musical programme.

19 p. m.—Weather report.

19 p. m.—Weather report.

19 p. m.—Weather report.

19 p. m.—Weather rep

1:65 p. m.—Studio programme.
1:30 p. m.—Weather report.
8:98 p. m.—Baschall scores.
8:05 p. m.—"Going for a Paddle," one of a series of safety talks under the analyses of the Providence Safety Council, to be given by Shirley Harrington.

8:10 p. m.—Musical programme, 8:30 p. m.—Gold Dust Twins, 9:00 p. m.—Everesdy Hour, WEDNESDAY

a, m.—Housewives Radio Exchange, A department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be answered by radio,
p. m.—Concert by the U. S. army
band, relayed from Washington, D. C.
Captain William J. Stannard, conduct-

ing.

8:30 p. m.—Davis saxophono Octetto.

9:00 p. m.—Baseball scores.

9:05 p. m.—Ed Parent and his Braemore dance orchestra.

19:00 p. m.—"The Grand Duckess," light opera.

THURSDAY THURSDAY,

1:05 p. m.-Studio programme. 1905 p. m.—Studio programms.
 1:50 p. m.—Weather report.
 1:15 p. m.—Baseball scores.
 1:20 p. m.—Charles E. Price, secretary-manager of, the Automobile Club of Rhode Island, will talk on "Auto Driving."

Driving."

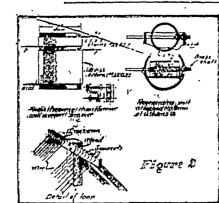
O' Mine" and "Rowan Tree," by Gordon Marquis, bariton; Scotch selections by Jack B. Cullen, banjo-guitar; "Wells o' Wearle" and "Hame o' Mine," by James Pearson, tenor; "I Belong to Glasgow" and "She's the Lass for Me," by "Sandy" Miller, Scotch comedian; Mrs. Robert Peacock, planist and accompanist.

planist and accompanist.

p. m.—Clicquot Club Eskimos.
p. m.—Silvertown Cord Orchestra
under the direction of Joseph Knecht

FRIDAY.

a. m.—Housewives' Radio Exchange.
A department conducted by Mrs. Wood
on all mattersyof household interest. 10:00 #



All questions submitted will be ans wered by radio.

1:05 p. m.—Studio programme.

1:30 p. m.—Weather report.

8:30 p. m.—Baseball scores.

8:35 p. m.—Charles O. Foster, tenor.

1:00 p. m.—Whittall's Algio-Persians.

SATURDAY.

1:05 p. m.—Studio programme.

1:30 p.m.—Weather report.

WEAN—THE SHEPARD STORES—367

Today.

G.30 h. m.—WEAN dinner dance, Jimmy Walsh and his dance orchestra.

8:00 p. m.—Warled programme.

9:00 p. m.—Musical programme.

Wednesday.

11:55 a. m.—Time signals.

12:10 p. m.—Weather report.

12:15 p. m.—Musical programme.

12:15 p. m.—Musical programme.

12:15 p. m.—Musical programme.

12:16 p. m.—Dinner dance, music by the Asia Serenaders.

8:00 p. m.—Organ rectial by J. Welr.

8:30 p. m.—Playlet.

9:00 p. m.—Dance music, Rhodes orchestra, direction Charles E. Culverwell, broadcast from Rhodes-on-the-Pawtuxet.

7:10:00 a. m.—Home service talk by Miss Kathleen Atkinson.

11:55 a. m.—Weather report.

12:15 p. m.—Musical programme.

4:00 p. m.—Organ rectial.

0:00 p. m.—Organ rectial.

0:00 p. m.—Organ rectial.

11:55 a. m.—Time, signals.

11:55 a. m.—Time, signals.
12:00 p. m.—Shepard Colonial Concert Or chestra.
12:10 p. m.—Weather report.
12:15 p. m.—Musical programme.
4:00 p. m.—Musical programme.

12:15 p. m.—Musical programme.
4:00 p. m.—Musical programme.
4:30 p. m.Weather report.
6:30 p. m.—WEAN dinner dance.
8:00 p. m.—WEAN dinner dance.
8:00 p. m.—Dance music by Al Mitchell and his Areadia Dance Orchestra.
8:10:155 a. m.—Timo signals.
12:00 p. m.—Shepard Colonial Concert Orchestra.
12:10 p. m.—Weather report.
12:15 p. m.—Weather report.
12:15 p. m.—Al Mitchel and his Areadia Dance Orchestra.
6:30 p. m.—Olimer dance, music by the Asia Serenaders.
8:00 p. m.—Organ recittal.

WLSI-THE LINCOLN STUDIOS-40. Monday, 8:00 p. m.—F. C. Hunt Corporation hour 9:00 p. m.—Rhode Island Supply Compan

serenaders.

Friday.

6:30 p. m.—Port Arthur Orchestra and
Cabaret.

#### OUT OF TOWN STATIONS To-Day

RDRA-EAST PITTSBURGH-309 7:15 p. m.-Baseball geores. 8:00 p. m.-Concert.

RFI-LOS ANGELES-167

# 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 an nouncements. Figures following stations denote wave length

Church, WHN, 361.
7:45—Church, WGR, 318.
7:30—Church, WHAR, 275.
8:00—Concert, WBZ, 333.
Vespers, KFI, 469.
Concert, WTAM, 380.
Special, WFBH, 273.
Special, KDIKA, 300.
Vocalist, WJZ, 454.
Band, KNX, 337.
Vespers, KGO, 561.
8:30—Organ, KOA, 322.
Orchestra, WBAL, 246.
Special, KNX, 337.
8:45—Chimes and sermonette, WSAI, 326.
9:00—Orchestra, WPG, 299.
Concert, WBAL, 233.
Concert, WBAL, 256.
Planist, WFBH, 273.
Concert, WHAR, 275.
Vocalists, WJZ, 454.
9:15—Atwater Kent hour, WCCO, 416:
WGR, 319: WSAI, 326; WWJ
352: WEAF, 492.
Concert, WIP, 508.
Concert, WIP, 508.
Concert, WGR, 379.
8:45—Band, WFAI, 326.
Band, WTAG, 545.
Volinist, WJZ, 454.
Concert, WGY, 379.
8:45—Band, WEAF, 492.
10:00—Church, WGA, 326.
Band, WEAF, 492.
10:00—Church, WGC, 484.
Church, WSB, 428.
Male Quartet, WBZ, 333.
Special, WFBH, 273.
10:20—News bulletins, WTAG, 545.
10:30—Orchestra, KGO, 361.
Concert, KYW, 535
Organ, WPG, 299.
Church, RNX, 337.
Orchestra, KMTR, 238.
Band, KGA, 322.
Chapel, WOAW, 526.
Church, WFAH, 273.
11:15—Address, KFUO, 545.
11:30—Church, KGW, 491.
Organ, WCCO, 416.
Concert, WGW, 491.
Organ, WCCO, 416.
Special, KNX, 337.
Orchestra, KMTR, 238.
Concert, WGR, 422.
1:00—Dance music, KFI, 469.
Concert, KGW, 491.
Special, WRBM, 228.
1:15—Jazz band, WKRC, 422.
2:00—Orchestra, KFI, 469.
Concert, KGW, 491.
Special, WBBM, 228.
1:15—Jazz band, WKRC, 422. The hours are based on daylight saving

LOCAL STATIONS 10:55—Church, WEAN, 367, 7:20—Concert, WJAR, 305, 7:30—Organ, WEAN, 367, 9:15—Concert, WJAR, 305. OUT-OF-TOWN STATIONS

OUT-OF-TOWN STATIONS

9:00—Children': 'lour, WJZ, 525.

10:45—Church, WGR, 319.
Church, WGR, 319.
Church, WGW, 379.

11:00—Church, WOAW, 526.
Church, WHAR, 275.
Church, WHAS, 341.

11:30—Sunday school, WSB, 428.
Church, WHN, 361.

12:00—Church, KYW, 536
Church, WHAS, 399.
Church, WWJ, 382.
Church, WWEO, 285.

12:30—Crgan, WHN, 361.

12:50—Church, WCO, 415.
12:50—Church, WSB, 428.

1:30—Concert, WBBM, 226.
2:00—Church, KOA, 322.
Church, KNA, 337.
Church, KNA, 337.
Church, KFI, 467.

2:15—Concert, WHAR, 275.
2:25—Church, KGW, 491.
3:00—Orchestra, WWJ, 352.
Church, KGO, 361.
Concert, WGA, 491.
3:00—Orchestra, WWJ, 375.
Church, KGO, 361.
Concert, WGA, 492.
Church, KGO, 361.
Concert, WGA, 492.
Church, KGM, 491.
3:00—Religious hour, WANY, 375.

4:10—Religious hour, WRNY, 375.

4:10—Rand, WHAD, 275.

4:00—Religious hour, WRNY, 375. 4:15—Band, WHAD, 275.

4:00—Religious hour, WRNY, 375.
4:13—Band, WHAD, 275.
Community chorus, WPG, 200.
Recital, WIP, 508.
4:30—Concert, WOAW, 526.
Raseball scores, WHN, 361.
Vespers, WEAF, 492.
5:00—Concert, WBBM, 226.
Concert, WFBM, 2273.
5:30—Concert, KYW, 536.
Planist, WEAF, 492.
6:00—Orclestra, WTAM, 380.
Concert, NNX, 337.
Concert, WJZ, 454.
6:10—Church, WCCO, 416.
7:00—Orchestra, WTAM, 389.
Concert, WSB, 428.
Church, WGC, 416.
7:00—Orchestra, WTAM, 389.
Concert, WSB, 428.
Church, WGC, 416.
7:00—Chestra, WTAM, 369.
Concert, WFBH, 273.
Orchestra, WGA, 341.
7:05—Church carillon, WGY, 379.
Church wHP, 508.
7:20—Capitol Theatre Family, WWJ, 332: WEAF, 492.
7:25—Orchestra, WJZ, 454.
7:30—Concert, WJCA, 341.
Church, WF, 304.

KFUO-ST. 1,0UIS-545 11:15 p. m.-Address and music.

RGO-OAKLAND-361
p. m.-First Daptist Church service,
Dr. J. Whitcomb Brougher, pastor,
p. m.-Vesper service, Graco Cathedral, San Francisco. 8:00 n

8:00 p. m.—Vesper services arranged by Federated Church musicians. 10:30 p. m.—KFI special. 12:00 p. m.—Organ recital.

10:30 p. m.—Concert.

11:35 p. m.—Pirst Raptist Church services.

1:00 a. in.—Concert.

KGW-PORTLAND-491
2:25 p. m.-Service of the First Presbyterian Church.
11:30 p. m.-St. Stephen's Pro-Cathedral.
1:00 a. m.-Concert.

KMTR-HOLLYWOOD-238 11:00 p. m.-Concert. 12:00 p. m.-Concert.

KNX-LOS ANGELES-337 2:00 p. m.—First Presbyterian Church of Hollywood, Rev. Stewart P. MacLen-nan, pastor. 6:00 p. m.—City Park Board musical pro-

WBAL-BALTIMORE-216

WRZ-SPRINGFIELD-333

WCAE-PITTSBURGH-461

WCCO-ST. PAUL-MINNEAPOLIS-416

WEAF-N. HIK-402

3:00 p. m.—Interdent minational services under the auspices of the Grenter New York Federation of Churches,

4:00 p. m.—Instrumental programme of sacred music under the auspices of teh Greater, New York Federation of Churches.

Churches.
5:30 p. m.—Edward Steele, concert planist,
6:00 p. m.—Orcheg'ral concert with Frances Sebel, soprano soldist.
7:20 p. m.—Musical programme by Maj.
Edward Bowes and the Capitol Theatre
Exceptive.

9:15 p. m.—Atwaier Kent hour. Allen McQuhae, tenor soloist with orchestra.
9:45 p. m.—Goldman band concert, Edwin Franko Goldman conducting, direct from the Mali in Central Park. Emily Day, soprano soloist.

• WFBH—NEW YORK—273

5:00 p. m.—Studio programme.

6:50 p. m.—Motor caravan.

7:00 p. m.—Concert.

8:00 p. m.—Talk.

8:05 p. m.—Fasemble.

9:00 p. m.—A. D. R. Sullivant, composer.

pinnist,
 9:30 p. m.—Hluminato Miscrendino, violinist, and Frances Cuce, soprano.
 10:00 p. m.—Special programme, Miltor

10:00 p. m.—Special programme, Milton Wallace of "Able's Irish Rose;" music, 10:45 p. m.—John Sheviln, tenor, 11:00 p. m.—Orchestra,

WFI-PHILADLPHIA-391. p. m.—Services from Arch Street Pres-hyterian Church, sermon by Dr. Clar-ence E. Macartney.

WGBS-NEW YORK-316.
p. m.-Spanish dance and classical selections; Spanish songs.

WGR-BUITALO-319.

a. m.—Service direct from the minster Presbyterian Church, Samuel V. V. Holmes, minister.

planist.

p. m.—Hennepin Avenue M. E. Church, Minneapolis, Rev. Lucius H. Bugbee,

6:30 p. m.—Dinner concert. 7:20 p. m.—Capitol Theatre Family.

p. m.—Concert.
p. m.—Golden Rule hour of the Near East Relief.

WBBM-CHICAGO-226
1:30 p. m.—Sacred classical concert,
5:00 p. m.—Musical matinee,
9:00-10:00 p. m.—Melody hour,
1:00 a. m.—The Nutty Club.

8:80 p.

10:00 T

WHN-NEW YORK-361 11:30 p. m.-Calvary Baptist Church, 12:30 p. m.-Organ recital, Marsh McCurdy, 6:00 p. m.—City Park Board mesons pramme.
8:00 p. m.—Roberts Golden State Band.
8:30 p. m.—Chat by Helene Sullivan, film actress.
10:30 p. m.—First Unitarian Church.
11:00 p. m.—Concert orchestra.
12:00 p. m.—First Presbyterian Church of Ballywood.

12:30 p. m.—Organ recital, Marsh McCuruy, organist.
3:00 p. m.—Inspiratoin hour.
4:30 p. m.—News flashes, racing and baseball results.
5:00 p. m.—Dance orchestra.
5:30 p. m.—News flashes, racing and baseball results. 12:00 p. m.—First Presnyterian C Hollywood. 1:00 a. m.—Special programme.

ball results. 7:30 p. m.—Calvary Baptist Church. ROA-DENVER-323
p. m.—Service of Montview Presbyterian Church, Rev. William Li Barrett, pastor.
p. m.—Organ recital.
p. m.—Open-air concert 4:15 p. n p. m.—Community mental recital:

7:05 7:20 8:00 8:30

WIP—PHILADELPHIA—506.

m.—Community vocal and instru-

7:15 p. m.—Evening service of Holy Trin-D. D., rector.
9:15 p. m.—Concert.
10:30 p. m.—Organ and vocal recital. KYW-CHICAGO-536

m.—Services from the Second Presbyterian Church, Rev. Josiah Sibley, pastor.
p. m.—Studio concert.
p. m.—Classical concert.

2:00-Orchestra, KFI, 469. Popular music, WKRC, 422.

7:45 p. m.—Service of the Central Presby-terian Church, Rev. R. J. MacAlpine, minister. 9:15 p. m.—Atwater Nent Hour, Allen Mc-Quhae, tenor soloist, with orchestra.

WGY-SCHENECTADY-379.

a. m.—Service of First Church of Christ, Scientist.

p. m.—Church carillon.

p. m.—Orchestra.

p. m.—Miscellaneous programme.

p. m.—Miscellaneous programme.

WHAD-MILWAUKEE-275. m.-Band concert.

WHAR-ATIANTIC CITY-275.

10:45 a.m.—Services of Chelsea Baptist Church, Dr. Thomas J. Cross, pastor.

2:45 p. m.—Sermon.

7:50 p. m.—Services of Chelsea Baptist Church.

9:00 p. m.—An hour with the classics.

WHAS-LOUISVILLE-300.

0 m.—Service under auspices of the Broadway Christian Church, the Rev. Dr. Briney, pastor.

WJZ-NEW YORK-454

9:00 a. m.—Children's hour.
6:00 p. m.—Isdore Greenberg, violinist.
6:30 p. m.—John 'De Beuris, clarinetist;
Ernest Gerhardt, tenor.
7:05 p. m.—Park Avenue Baptist Church
carillon.
7:25 p. m.—Orchestra.
8:00 p. m.—Betty Poulus, contraito.
8:15 p. m.—Trio.
9:00 p. m.—Minerva male quartet.
9:30 p. m.—Godfrey Ludlow, violinist.

WKRC-CINCINNATI-122 WKRC-CINCISNATI—122

12:00 p. m.—Classical programme; vocal and instrumental solos.

1:15 a. m.—Jazz band.

2:00 a. m.—Miss Marie Turner, "Blues and Ballads."

p. in.—Knights of Pythias, Milton Lodge, No. 93, Male Quartet. WMAK-BUFFALO-265 -Service at Churchill Tabernacle. 4:00 p. m.—Church service conducted by Rev. Patrick E. Maker, pastor St. Francis Navier Roman Catholic Church. Special music service by boys' choir under direction Loo Heyl, organ-WMCA-Na... 10RK-341 11:00 a. m.—Christian Science services, 7:00 p. m.—Orchestra. 7:50 p. m.—Orchestra.

WOAW-OMAHA-528
-Chanel service, Rev. R. R. WOAW-OMAHA-528

11:00 a. m.—Chapel service, Rev. R. R.

15:00 p. m.—Father Flanagan's Boys home period.

4:30 p. m.—Artists.

11:00 p. m.—Chapel service, North Presbyterian Church, Rev. C. G. Butler, pastor.

Minneapolis, Rev. Dictios II. 2005, pastor.

6:50 p. m.—House of Hope Presbylerian Church, St. Paul, Rev. II. C. Swearingen, D. D., pastor.

9:15 p. m.—Atwater Kent hour.

11:30 p. m.—St. Paul numleipal organ rocital by Huge Goodwin. WOC-DAVENPORT-484.

3:00 p. m.—Old Folks' musical programme. 10:00 p. m.—Church service. 11:30 p. m.—Musical programme.

WPG—ATLANTIC CITY—209,
3:30 p. m.—Vessella's concort band and
soloists. Steel Pler.
4:15 p. m.—Community vocal and instrumental recital. St. James Episcopal
Church.
9:00 p. m.—Last-minute news flashes and
haseball scores.
9:15 p. m.—Paul Althouse, tenor, Metropolitan Opera Company; Estelle Wentworth, formerly prima donna soprano,
San Carlos Opera Company.
10:30 p. m.—Vocal, instrumental and organ
concert. Auditorium of Atlantic Cityhigh school.

WREO-LANSING-285.
n.—Service of First Baptist Church,
r. R. W. Hobbs, pastor,

WRNY-NEW YORK-375, 3:00 p. m.—MacDowell Sisters, 3:30 p. m.—Daisy Niebling, soprano, 3:45 p. m.—Helen Halprin, planist, 4:00 p. m.—Dr. Reisner's hour of religion.

WSAI-CINCINNATI-326. m.-Chime concert and sermo

9:15 p. na.—Atwater Kent programme 9:45 p. na.—Goldman band concert.

WSB-ATLANTA-428.

11:30 a. m.—Agoga Sunday school.

12:54 p. m.—First Presbyterian Church service, Dr. J. Sprole Lyone, pastor.

7:00 p. m.—Sacred concert

10:00 p. m.—North Avenue Presbyterian Church service, Dr.—Richard Orme Film, pastor.

WSM-NASHVULE-282. p. m.—Service of First Presbyterian Church, Rev. James I. Vance, pastor.

WTAG-WOBCESTEB-548, m-Goldman band concert. m-News bulletins.

Ã+ B-Constructional details of frequency transformer

2:00 p. m—Church revices under direction of L. A. Church Federation.
3:00 p. m.—Temple Baptlet Church. Wiring diagram of six-tube set with indoor aerial