Smallest Regenerative Set in World-Flewelling

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SATURDAY, JUNE 23, 1923

PHOTOSCULPTURE

FOUR GIANT PLANTS LINKED FIRST TIME

BROADCASTS PUT ON AIR SIMULTANEOUSLY

WEAF, WGY, KDKA, and KYW Widely Separated, Join in Experiment

Widely Separated, Join in Experiment

NEW YORK, N. Y.—For the first time in history, four big stations in various parts of the country were linked together and broadcast simultaneously recently when the program of the National Electric Light Association convention here was put on the first WEAF, WGY. OKA and York The National word within microphones in the hall by Wephone Irres. The speaker as the eventing meeting was Julius K. Barnes, president of the United States Chamber of Commerce, and Anna Case, Metropolitan Grand Opera star, sang.

The engineers who worked on the installation of the lines encountered a serious problem in preparing telephone lines suitable to the handling of high frequency currents. Each of the lines had to be carefully balanced and equalized by means of special networks and other adjusting instruments.

Hear Anna Case at Home

When Anna Case sang her woice was heard by a vast assemblage on the common and in the streets of Flemington, N. J., the century-old town near which the singer spent her early girlhood days.

This was accomplished by means of a mobile public address system which a citizens' committee arranged to bring to the historic county seat of Hunterdon County for the occasion.

A receiver operated by engineers picked up Miss Case's voice, and transmitted it to a big vacuum tube voice amplifier which made her voice audible in even the farthermost corners of the park and along the tree-lined streets.



SCULPTOR NO LONGER NEED SEE SUBJECT

Carving by Ether Waves Made Possible by Radio Photo Transmission

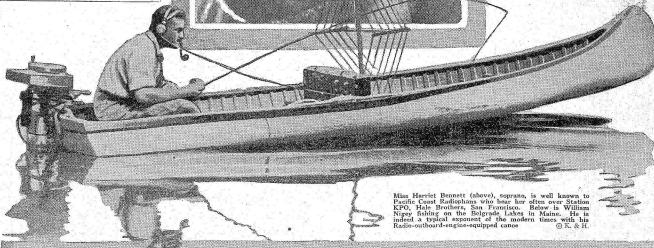
British-Yank Invention

of Pose Are Flashed Through Air to Artist Waste Miles Distant

Ey. Fred. Claire Zumbro
First, pictures by Radio and now "Radiosculpture"! This remarkable accomplishment is brought about through the inventions of H. M. Edmunds and C. Francis Jenkins. By combining the inventions of these two men it is possible to carve a perfect likeness of a person thousands of miles away. Not a slight artistic likeness is the result, but a mechanically perfect model that will measure correct to the thousandth of an inch.

It is now made possible for a person on shipboard of a trans-Atlantic liher to sit for a few seconds before a camera and be able to call at the studio ashore, upon arrival, and see his own likeness carved in stone, marble or granite cast in bronze. The process requires from two to three days at the most for completion, after the (Continued on pase 2)

(Continued on page 2)



DIGEST FANS SEND IN OFFER COUPONS

TO GET VALUABLE STAND ARD PARTS FOR SETS

More Items Added to List—Readers Endorse Simplicity of Special
Offer Idea

SPECIAL REWARD OFFER Coupon Number 4 This Special Reward Coupon appears each issue in Radio Digest until further notice. When sent in accompanied by necessary remittance, according to the rules governed to the rules governed to be compared to the rules of offer below. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See apparatus list and rules of offer below. Save Me — I Am Valuable

Readers of the Digest all over the country are beginning to send in their Special Reward Offer Coupons. Although only three of the coupons have been printed so far, many letters have flooded in containing two consecutive coupons and remittance for various of the items listed below under Class A. Other Radiophans have told their intentions of saving the offer coupons for more expensive apparatus, listed in Class E or above.

A number of new items have been added this week to the very complete list of apparatus already catalogued. Among these are Turney spider web coils and mount, Premier variable condensers and addio frequency transformers, Delta Midget tubes with sockets and adapters, and Resistometers.

The simplicity of the method of getting the many standard and valuable parts and accessories for sets, in practically every case has appealed to the enthusiastic readers. All that is necessary is to clip to consecutive coupons appearing weekly no page two, and send them, accompanied by the necessary remittance for the selected item, to the Digest. There is no limit to the number of coupon series that can be sent in by an individual for apparatus.

Thus to *Bemember

Thus to *Bemember**

Thus of *Bemember**

Thus to *Bemember**

The point must be emphasized, to the sumber of coupons injured to the coupons decessary and the cash remittance for the selection more simple the tense have been almost our coupons and cash, checks and monor orders but no postage stamps will be accepted.

Class A Articles

For two consecutive coupons and amounts of the familiar order of the coupons of the familiar of the selection more simple the time have been dimensed; it is climber of consecutive number of coupons and thirty sents (80.80) any one of the following articles will be sent to the selection more simple the familiar of the familiar of the selection more simple the familiar of the familiar of

.086 MH., or SW-29 with .300 MH.

Class G. Articles

For six connecutively numbered coupons and ninety cents (80.90 mt.)

For six connecutively numbered coupons and ninety cents (80.90 mt.)

For six connecutively numbered coupons and ninety cents (80.90 mt.)

For six connecutively numbered coupons and ninety cents (80.90 mt.)

For six connecutively numbered coupons and ninety cents (15 Federal 3-00 mt.)

Federal 6-01 mt. Rhosetat; 1 Federal 3-00 mt. (Power)

Rhosetat; 1 Amperite Automatic Filament Control (with mounting); 1 Martin-Copeland Martin-Copeland Priorit Inductance Switch; 1 Martin-Copeland 7-Point Inductance Switch; 1 Martin-Copeland 7-Point Inductance (Continued on page 9)

AN EVENING AT HOME WITH THE LISTENER IN (SEE NOTE BELOW FOR INSTRUCTIONS)

Station and City	Met.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCA, Toronto, Ont	400	6:00- 7:00	6:00- 7:00	6:00- 7:00	6:00- 7:00	6:00- 7:00	6:00- 7:00	5:45- 6:45
CFCN, Calgary, Alta	440	10:00-11:00				11:30- 1:30		11:00- 1:00
CKAC, Montreal, Que	430	12001000	6:00- 9:00		6:00- 9:00			3:00- 4:30
KDKA, E. Pittsburgh, Pa	360	5:00- 9:00	5:00- 9:00	5:00- 9:00	5:00- 9:00	5:00- 9:00	5:00- 9:00	6:30- 7:30
KFAF, Denver, Colo	360	9:00-10:00	9:00-10:00		9:00-10:00	9:00-10:00		
KFDB, San Francisco, Calif.	509	10:00-12:00	Aller and the second	10:00-12:00		10:00-12:00	0100 10.00	9:00- 9:30
KFI, Los Angeles, Calif	469	9:00- 1:00	9:00- 1:00	9:00- 1:00	9:00- 1:00	9:00- 1:00	9:00- 1:00	10:00- 1:00
KGW, Portland, Ore	492	10:00- 2:00	120	10:00-11:00		9:00- 2:00	0.00- 1.00	9:00-10:00
KHJ, Los Angeles, Calif	395	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	10:00-12:00
KPO, San Francisco, Calif	423		10:00-12:00	PROPERTY AND ADDRESS OF	10:00-12:00	0110 10100	10:00-12:00	10.00-12.00
KSD, St. Louis, Mo	546	8:00-12:30	8:00-10:00	8:00-10:00		8:00-12:30	8:00-10:00	*********
KYW, Chicago, III	345	CALCULATION CONTROL OF THE PARTY OF THE PART	7:00- 9:00		7:00- 9:00	7:00- 9:00	7:00- 9:00	6:00- 7:00
NAA, Radio, Va	435	5:45- 7:30	6:05- 7:20	6:25- 8:40	5:45- 7:40	7:00- 7:40		
PWX, Havana, Cuba	400	contrates and free	Landard Court	8:00-10:30		1100 1110	8:00-10:30	*****
WBAP, Fort Worth, Texas.	476	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	7:00- 7:20	3:30- 4:30
WBZ, Springfield, Mass	337	6:30- 8:00		6:30- 8:00	6:30- 8:00	6:30- 8:00	6:30- 8:00	7:00- 8:00
WCX, Detroit Mich	517	7:00-10:00			7:00-10:00	7:00-10:00		4:00- 5:00
WDAF, Kansas City, Mo	411	6:00- 1:00		6:00- 1:00	6:00- 1:00	6:00- 1:00	6:00- 1:00	11:45- 1:00
WDAJ, College Park, Ga	360	7:30-11:30	7:30-11:30	10:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30
WDAP, Chicago, Ill	390		10:00- 2:09	10.00 11.00	10:00- 2:00		10:00- 2:00	9:00-12:00
WDAR, Philadelphia, Pa	395	5:30- 9:00	5:30- 6:00	5:30- 9:00	5:30- 6:00	6:00- 1:00	5:30- 6:00	
WEAF, New York, N. Y	492	5:30- 8:00	5:30- 6:00		5:30- 8:00	5:30- 6:00	5:30- 8:00	
WFAA, Dallas, Tex	476	8:30- 9:30	8:30-12:00		8:30-12:00	8:30- 9:30	8:30-12:00	9:30-10:30
WFL Philadelphia, Pa	395	4:30- 5:00		4:30- 9:30	4:30- 5:00	6:30- 8:30	7:00-10:00	5:30- 6:30
WGL Medford Mass	360		7:30- 9:00	5:45- 7:30	8:30-10:00	8:30-10:00	7:30- 9:00	8:30-10:00
WGM, Atlanta, Ga	429	9:30-10:30	9:30-10:30	12:00- 1:00		9:30-10:30	9:30-10:30	7:30- 8:00
WGM, Atlanta, Ga WGR, Buffalo, N. Y	319	6:00- 8:00	0.00 10.00	6:00- 8:00	0.00-10.00	6:00- 8:00	9.90-10:90	7:00- 0:00
WGY, Schenectady, N. Y.	380	6:45- 9:00	6:45- 9:00	0100 0100	6:45- 9:00	6:45-11:00	7:00- 8:00	6:30- 7:30
WHA, Madison, Wis	360	7:00- 9:00	7:00- 8:00	7:00- 8:00	7:00- 9:00	7:00- 8:00	7:00- 8:00	0.50- 7.50
WHAS, Louisville, Ky	400		7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	**********
WHAZ, Trov. N. Y	380	8:00- 9:30	10		1100 0100			******
WHB, Kansas City, Mo	411	2100	8:00-10:00		8:00-10:00			8:00-10:00
WHK, Cleveland, O	360	5:00- 5:30	5:00- 5:30	7:00- 8:45	5:00- 5:30	5:00- 5:30	5:00- 5:30	7:00- 8:45
WIP. Philadelphia Pa	509	4:00- 5:30	5:00-10:00	5:00- 5:30	5:00- 5:30	5:00- 5:30	8:10-10:00	04:0 -00:1
WJAX, Cleveland O	390		6:30- 8:30		7:15- 9:30	0.00- 0.00		
WJY, New York, N. Y WJZ, New York, N. Y	405		5:30- 9:30	Same and a second	5:30- 9:30	5:30- 9:30		
WJZ, New York, N. Y.	455	5:30- 9:30	5:30- 9:30	5:30- 9:30	6:30- 9:30	5:30- 9:30	5:30- 9:30	6:30- 8:00
WKAQ, San Juan, P. R	360		6:30- 8:00		0.00- 0.00	0.00- 5.00	6:30- 8:00	0.00- 0.00
WLAG, Minneapolis, Minn.	417	6:30-10:30	6:30-10:30		5:30-10:30	6:30-10:30	6:30-10:30	7:30- 8:30
WLW. Cincinnati O	309	7:00- 9:00	9:00-11:00		9:00-11:00	0.00 10.00	0.00-10.00	1.00- 0.00
WMAO, Chicago, Ill WMC, Memphis, Tenn	448		7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	
WMC, Memphis, Tenn.	500	8:00- 9:30	8:00-12:00		8:00- 9:30	8:00-12:00		
WOAL San Antonio, Texas.	400		9:30-10:30	1947-170-0-170-1	7:30- 8:30	0.00-12.00	0.00- 0.00	9:30-10:30
WOC, Davenport, Ia	484	7:00- 8:30		10:00-11:00	7:00- 8:30	7:00- 8:30	9:30-10:30	7:00- 9:00
WOO. Philadelphia. Pa	509	6:00- 9:00			0.00	6:00- 9:00	0.00010.00	7.00- 9.00
WOR, Newark, N. J	405	5:15- 6:30		5:15- 6:30	5:156:30	7.00-10:00		
WOS, Jefferson City, Mo	441	8:00- 9:30		8:00- 9:30	12 E 1/250	8-00- 0-20		and the same of
WSB, Atlanta, Ga	429	10:45-12:00	10:45-12:00	10:45-12:00	10:45-12:00	10:45-12:00	10-45-12-00	7:30- 9:00
WSY, Birmingham, Ala		8:00- 8:45		8:00- 8:45		8-00- 8-45	10,40-12.00	7:30- 8:30
WWJ, Detroit, Mich	517	8:00- 8:45 7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00		7:30- 9:00

This fructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. If in addition your city is using Daylight Saving Time, add one hour to this result.

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Radio Digest, Illustrated, Volume V. Number 11, published Chicago, Illinois, June 23, 1923. Published weekly by Radio Digest Publishing Company, 123. West Madison Street, Chicago, Illinois. Subscription rates, yearly,

Chicago, Hilinois, under the Act of March 3, 1879.
of Radio"
at Home with the Land
World's Smallest Regenerative Set, Complete Details Showing How to Make
The Week's Advance Broadcast Programs.
Broadcastine Station Discuss D. V. C.
Broadcasting Station Directory, Part I—Station Schedules
Flewelling Answers, by E. T. Flewelling
Euroriais; Indi-Gest; Condensed by Dielectric
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to make a Camper's Portable Reflex Set, Part I-Carrying Case and Built-in Loon, by
Selectivity in Portable R.D86; Reviews of Books
Questions and Answers
Radio Illustrated, a Page of Pictures

Looking Ahead

For the Campers, Bathers, Automobilists, Hikers—and who not? Harry J. Marx will continue next issue to tell how to build a portable set complete in a fiber carrying case. Read page thirteen. Batteries, headset, and even a loop aerial are compactly assembled in a convenient unit. In the June 30 issue Mr. Marx will give three good hook-ups from which the builder may choose.

Beginners' First Steps by Thomas W. Benson next week will be devoted to the theory and operation of the vacuum tube as a detector. Mr. Benson's review of this important fundamental in the foundation of Radio knowledge, should be read even by the experienced amateur.

A Super of the Latest Type—The Nacireman—Complete hook-up diagram showing its wiring connections and parts. Many excellent reports have been given on this circuit. Watch for it next week as R.D.-87.

Flewelling Answers to Radiophans' Queries—a department for the Flivver Super fans. E. T. Flewelling continues to write exclusively for the Digest, while he prepares to spring a few more big surprises. Keep your eye on Flewelling!

Radio Baseball Schedule—for the Ball-Radiophan. This schedule will appear in an early issue and will tell what big stations are giving baseball results and what games are broadcast. Tell your baseball fan friend about it.

Have a Copy with You on Your Vacation WHEN YOU WANT

Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

M. O. for Five Dollars Year's Subscription to

RADIO PHOTOSCULPTURE

(Continued from page 1) essions have been transmitted by Ra-which in itself requires about one

impressions have been transmitted by Racidio, which in itself requires about one hour.

Develops From Photosculpture

H. M. Edmunds of Brighton, England, has given to the world "photosculpture" or "cameraography," after many years study and tireless work. This process is brought about by photographing the person or model to be graven and then chieding by a delicate machine, from the photo-impressions.

First the subject is placed before two planes formed by the exposed part of the plates in each camera give a two plane view of a three plane object, (the model). That is, the third, or front plane actually overlaps into each camera give a two plane view of a three plane object, (the model). That is, the third, or front plane actually overlaps into each of the other or side two. This simpler form is described for convenience. When more than a side view portrait is wanted, or it is desired to produce a statue, three or more cameras are used set in a circle around the model.

Example of Side View Portrait

For clearness only the side view portrait will be taken for an example of how "Radiosculpture" is accomplished.

With the two cameras set at an angle and focused on the model, a projector, similar to a slide machine used in motion picture theaters, is set between the two cameras and directly in front of the model. A ground glass slide engraved with vertical parallel lines, about 150 to the inch, is placed in the machine and the shadow of the lines thrown upon the model to be sculptured.

These lines will appear warped and distorted when viewed from any noint other

A ground gass since eigenven wan vertical parallel lines, about 150 to the inch, is placed in the machine and the shadow of the lines thrown upon the model to be sculptured.

These lines will appear warped and distorted when viewed from any point other than that occupied by the projector. It is upon this illusion that this step of the operation is based. The two cameras are set at an angle so as to obtain an impression of the contour of the lines as they fall and rise with the surface covered.

When the plates are developed and the pictures printed the result is a photograph of the model entirely covered with fine lines that accent the curvature of the surface covered. These are the charts for modeling the actual portrait.

So far only Mr. Edmund's invention has been considered, but at this point the equally wonderful invention of Mr. Jenkins overlaps his co-worker's. By Radiophotography the plates, or charts, are sent to where the actual work of sculpturing is to be done.

How Charts Are Sent by Radio

The process of sending these sculpturing charts by Radio is even more simple hirest the contract of the project of the proj

the material used than if a plaque is being made.

The furrows are so small and so closely drilled that it is almost impossible to see the ridge between with even the aid of a high powered microscope. To the naked eye the finished product appears even more delicately carved than handwork, work that requires weeks and even months to complete with the model constantly before the sculptor in a fatiguing pose.

Possible Uses of Invention.

In the future when a great person of note leaves a foreign land to visit another country it will be possible for him to view his own carved likeness produced in the land of visit. This can de done by Radiosculpture without the sculpturer even sceing his model.

ing his model.

By Radlosculpture it will be possible to preserve the drilling charts for future generations to erect statues of memorial or

retations to erect statues of memorial or commemoration.

Relief maps in time of war, may also be rapidly duplicated at distant points where needed.

Another valuable aid of Radiosculpture is that of transmitting architectural models from one city or country to another. No longer will an architect have to rely on drawings to impress a builder. It means a builder will be able to see an actual model of a building or statue submitted by an architect or sculpturer thousands of miles away.

INVISIBLE AUDIENCE HONORS ITS CHURCH

KDKA'S AIR CONGREGATION ERECTS BRONZE TABLET

Contributions Reach 4,700 for Memorial to First Chapel to Have Services Broadcast

Broadcast

PITTSBURGH.—The first Radio memorial tablet in the world—donated by and dedicated to the invisible Radio congregation of Calvary Episcopal Church, Pittsburgh. Pa.,—was unveiled during the church services of that congregation recently.

Hundreds of men, women and children witnessed the dedication of the bronze tablet to the unseen Radio congregation which is known to be in the area stretching from the Atlantic to the Pacific ocean and from Hudson Bay in the north of Canada to the extreme southern part of South America and which was enlisted when KDKA, one of the pioneer Radiophone broadcasting stations, began to broadcast Calvary Church's services more than two years ago.

Church's services more than two years ago.

First Radio Minister Present

Rev. Edwin J. van Etten, pastor of the church, who was the first minister in the world to have his services broadcast; Bishop Alexander Mann, of the Pittsburgh Episcopal diocese; H. P. Davis, representing Station KDKA of the Westinghouse Company, which station first broadcast church services, and other prominent Pittsburghers took part in the ceremony.

More than 4,700 people contributed to the purchase of the tablet. The contributions came in every form of legal tender-silver dimes, stamps, nickles, pennies and checks. A worker in a southern cotton mill sent Dr. van Etten two cotton socks with an inkel in each toe. A sailor from a boat on the Atlantic sent the minister 120 pennies he had won playing penny ante.

Misteners Respond Quickly
The contributions came as a result of Rev. van Etten's idea that his Radio congregation to which he had been preaching since January 2, 1921, might like to contribute to some sort of memorial. Accordingly during the reading of his regular announcement Dr. van Etten addressed, directly, his unseen hearers and told them of the plan and askad-small contributions from such of them. In algal tike to participate.

Responses to the ider are almost instantaneous. An hour after the announcement was broadcasted contributions were received from people living in Pittsburgh. People living in the district even walked to the minister's home a few minutes after they had listened in to him and left their contributions, even as he was preaching by Radio.

Calgary Siznals Heard

Calgary Signals Heard Off Japanese Coastline

5,000-Mile Transmission Sets New Canadian Record

CALGARY, ALTA.—What constitutes a record for long distance Radiophone broadcasting in Canada was established by CFCN, the broadcasting station of the W. W. Grant Radio, Ltd., here recently, when it was heard off the coast of Japan, which is approximately 5.000 miles from Calgary, and in another hemisphere. CFCN signals were heard by L. S. Haire, Radio operator on board the steamship Stuart Dollar, plying between San Francisco and the Orient, when the ship was just out of Yokohama, according to a communication received from Mr. Haire.

Actress in Flag Day Address NEW YORK.—One of America's most distinguished actresses, Julia Arthur, gave a patriotic recitation, "The Flag," on Flag Day, before Station WEAF'S microphone. Miss Arthur is one of America's favorites and gave much of her time during the war to patriotic service.

DEMPSEY MATCH ON CFCN—EVERY PUNCH

ALGARY, ALTA.—The GibbonsDempsey world heavyweight
Montana, will be broadcast July 4
from Station CFCN of Calgary, owned
by W. W. Grant, Ltd. A direct wire
will run from the ringside to the powerful station. This plant is the nearest super station in the vicinity and
has a working range of over 1,000
miles.

"AL" SMITH CHOOSES AIR AGAINST PRESS

A LBANY, N. Y.—By wire from Albany to Station WGY, Schenectady, Governor Alfred E. Smith reached the ear and mind of the citizens of New York state recently when he gave a report of his stewardship. The report generally reaches the voters through the press. This year Governor Smith talked direct to the people, explaining the financial condition of the state in detail.

MAKES CYCLE RIDING EASIER



Why shouldn't it be easier to ride a bicycle equipped with a portable set. (Note, the spokes should make a good antenna.) After balancing some regenerative sets it should be less difficult to keep one's balance on a cycle. At least Miss Josephine Kiernan thinks the plan worth smiling about © K. & H.

ARMY-NAVY CONCERTS TO BE SENT OVER U.S.

New Washington Plant to Relieve NAA During Summer

WASHINGTON.—Although the broadcasting of the government's band concerts
by NAA, Arlington, will cease during the
summer months, Radiophans within several hundred miles of Washington will be
able to pick up some of the concerts if the
plans of the Chesapeake and Potomac
Telephone Company are carried out.

By June 18, this company hopes to
complete its new station here and start

broadcasting the open air public concerts from the White Lot and local parks where the Marine, Navy and Army Bands play almost daily.

Through the aid of a new portable input apparatus recently perfected by the telephone engineers, the company expects to furnish the added electricity necessary to pick up concerts and transmit them by wire to their station for broadcasting. This apparatus is mounted on a motor truck and can be dispatched anywhere in the city where something is to be broadcast.

Important speeches and

RADIOS TREATMENT TO INJURED SAILOR

SEA-AMBULANCE ANSWERS EMERGENCY APPEAL

Vessel Anchored Nine Miles from Land Brings Help by Ether Waves

By L. M. Lamm

By L. M. Lamm
WASHINGTON, D. C.—The steamship
West Cahous, lying at anchor in Baltimore harbor, nine miles from the city,
needed medical help at about 3 A. M. recently and needed it quickly. A member
of the crew had fallen into the hold and
hurt himself seriously. So the captain of
the ship sent a Radio broadcast asking
help.

the ship sent a Radio broadcast asking help.

The call was picked up, not in Baltimore, nine miles away, but at Cape May, N, J, about 100 miles due east of Ealtimore. As Cape May was separated from the West Cahous by parts of New Jersey and Delaware and by the eastern shore of Maryland, not to mention Delaware and Chesapealee Bays, no direct help from it was possible.

But the operator was on the job. Promptly he consults Surgeon But the operator was on the job. Promptly he consulted the long distance list in the Baltimore telephone directly and called up the residence of the Public Health Service, surgeon in charge of the Marine Hospital in Baltimore, 100 miles to the west. The surgeon, roused from sleep to receive the message, asked him to Radio certain emergency treatment to the West Cahous and to direct the captain to send a boat to a certain pier in Baltimore, where he would find a surgeon waiting to go out to the ship with him. And so, in the middle of the night, in less than an hour, a "Radio-controlled." seasoing ambulance carrying a Public Health Service officer reached the side of the injured sailor and brought him later to the hospital.

PRIVATE PLANTS TO TAKE LAKE STATIONS

Step Necessitated When Navy Quits Nine Plants

CHICAGO.—Radio service will be provided for great lakes shipping as the result of a recent agreement of private broadcasters to handle great lakes traffic. R. H. C. Mathews, Station 92N, divisional water latendant of the American Radio Relay league, working in co-operation vit. Station WIAZ, will handle the "code stuff" for this territory. The necessity of getting a private broadcaster to handle the lakes traffic was caused by the navy's withdrawal from nine great lakes stations.

trom nine great lakes stations.

In Cleveland, according to an Associated Press report, the Great Lakes Wireless association was organized by vesselmen having boats equipped with Radio. Through this organization, which is headed by Fred L. Leckie, of Cleveland, the navy station at Duluth will be opërated by the association and negotiations are reported for the association to take over eight other navy stations.

Vermont "U" Plant May Be Link in Army Relay

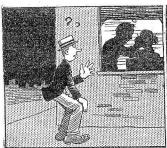
Star Student Station Drafted to Co-operate Officially

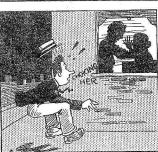
BURLINGTON, VT.—Owing to their activity and successful work of the past two years, the University of Vermont Radio station, IARY, has been selected to go through several tests in preparation for co-operating with the army Radio station at Ft. Ethan Allen in receiving and relaying sovernment messages. The station at the university is under the management and operation of the students, and, has been heard regularly in England this spring. Two years ago this station was one of the first to be heard in the amateur transatlantic tests to Scotland.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Undesirable Outside Interference









HEAR FALSE TINKLE OF LIQUOR GLASSES

CANADA PROGRAMS RAISE AWFUL THIRST IN U. S.

Alberta, However, Shatters All Illusions in States—She's Dry Herself! —But She Votes Again

By Jeffrey J. Dingman
CALGARY, ALTA.—Radio is playing a
tremendous part in increasing to an almost unendurable stage the thirst of
American Radiophans, rendered already
severely acute by the Volstead act and
ardent prohibition enforcement agents.
Recent broadcasts from CFCN, the station of the W. W. Grant Radio, Ltd., here,
have added greatly to the thirst of that
part of the American nation which nightly
clamps the headest on and tunes in its

have added greatly to the thirst of that part of the American nation which nightly clamps the headest on and times in its receiving set to Canadian stations. For, watted on the ether waves out of Canada come vague hints and aggravating rumors of flowing wine and liquor to be obtained just by crossing the border. Evidently Radiophans of the United States are suffering from an illusion, for there is just as total prohibition of alcoholic liquors in Alberta at the present time as there is in the United States. However, the people of Alberta are again to vote on the liquor question November 5 and Radiophane of Canada's sister nation across the international line are already making preparations to have their receiving sets in perfect order for that night to hear the big news broadcast from CFCN at Calgary.

at Calgary.

Cabaret Broadcast Starts Something

at calgary.

Cabaret Broadcast Starts Something

Ever since jazz music from the Plazacabaret in Calgary has been broadcast by
remote control from CFCN, a flood of
letters with the words "prohibition,"
"liquor," "dry," and the remainder of the
well-known vocabulary, has been pouring
into the broadcasting station.

In repudiation of rumors to this effect
which apparently have become exceedingly
common in the United States, it may be
stated that absolutely no intoxicating liquors are allowed on the premises of the
Plaza cabaret, and only the imagination
of the listeners in are responsible for the
false impression which has been gained.
Business men of Calgary report that
this feature, recently commenced by
CFCN would be a considerable factor in
attracting a great many tourists from
the United States to Canada this year.

Veteran Humorists Pat on

Army Program at WCAH
COLUMBUS. OHIO.—La Societe des
Hommes et 8 Chevaux, the fun organization of the American Legion, broadcast
a brogram recently through Station
WCAH, the Entrekin company. The Columbus branch of the order, Am Le Voiture No. 15, made its Radio debut on this
occasion, and presented music and humor
redolent of life in the army and navy,
featuring bugic calls so familiar to the
wearers of the olive drab.

Form Radio Club in Berlin

WASHINGTON, D. C.—A Radio club has been founded in Berlin by a number of experts and amateurs for the purpose of furthering the interests of amateur Radio operators and of bringing general Radio matters to the attention of the authorities.

New CARTER Vernier Control RHEOSTAT Simple, positive, distinctive, reliable. Statu after the analysis of the state of t

FREED - EISEMANN Licensed Essential Parts

Complete wiring diagrain, instructions, etc. sent in special container with patented essential parts. Three NEUTROFORMER COILS

mounted on variable of the condensers, and but the condensers, and but the condensers, and but the condensers, and condensers, and condensers, as well as complete assembled five-tube NeutrodyneSetimanogany cabinet, ModelNR-5, \$156.

Or send 25c for Neutrodyne Constructor which shows "How to Make the Neutrodyne" FREED-EISEMANN RADIO CORPORATION
255 FOUrth Avenue New York Licensed by I. R. M. Inc. Under Hazeltine Patents

SUMMER PHOTOGRAPHS? EARN A DOLLAR-

UMMERTIME means summer pictures. You and your camera can earn a dollar by sending the Digest out-of-doc photos involving the use of Radio in camp, the automobile, swiming, boating, canceing, on the hike, playing golf, etc. Send such photographs with negatives and a few descriptive words, including a stamped, addressed envelope so that unsuitable pictures may be returned.

SUMMER PHOTO DEPARTMENT.

SUMMER PHOTO DEPARTMENT, Radio Digest, 123 W. Madison St., Chicago..

RADIO FIRE ALARM SYSTEM FOR BOSTON

City Soon to Have Airphone School for Laddies

BOSTON, MASS.—Although Radio has had an unofficial status in the Boston fire department for some time, most of the firehouses having receiving sets to get the broadcasts and while away the time during hours between alarms, the department is soon to have a school of Radio instruction.

is soon to like a school of A. Glynn has ortion.

Commissioner Theodore A. Glynn has ordered that such a school be established
at once with George A. Fickett, superintendent of fire alarms in charge, and twenty men under instruction at present. When
the course is completed, the men of the
school will man the Radio fire alarm
equipment which will augment the regular
signal system, and eventually perhaps,
supersede the wire system in directing
movements of the fireboats at East Boston
and South Boston, which now have Radio
equipment.

Copy Navy Code 11,500 Miles

Copy Navy Code 11,500 Miles WASHINGTON.—A Radiogram from the naval station at Caviet, P. I., addressed to San Francisco for relay to Washington, was picked up in the Washington Radio Central recently and copied before the San Francisco operator indicated its receipt. Needless to say, it was not relayed to Washington. This message was copied without error over 11,500 miles of sea and land.

Radio for English Travelers

West Civerpool Ex

Active for English Travelets

Leincox, ENNS The livernoof Express, a fast train running between Liverpool and London, has been equipped with
a powerful receiving set, loud speaker and
loop aerial, which are located in a special
Radio salon, where the passengers can be
amused and interested during the tedious
journey.

We Live In Kansas

—but we receive programs from Atlanta, Min-neapolis, Davenport, Fort Worth, Madison, Los Angeles, Dallas, Kansas City, St. Louis, Berver and San Antonio on Crystal without batteries, Your self-stream of the Company of the Company of the Stream Stamp of Carther information or \$1.00 for copyrighted drawings and instructions. Everything explained. Satinfaction guaranteed,

LEON LAMBERT, 501 South Voluteia, Wichita, Kangas

ETHER COMPASSES FOR NAVY BLIMPS

Officials Consider Plan to Equip Big "ZR" Ships for Dark and Fog Navigation

WASHINGTON.—Plans for equipping the two new naval rigid airships with Radio compasses so that they can navigate in darkness or in fog, are under consideration. These are the great ZR ships now building.

It is believed that the Radio compass installations can be made satisfactorily, and that this feature will prove a valuable asset for the efficiency and safety of both personnel and material through assisting the accuracy of navigation. The location selected was adjacent to the observation platform located on top of the ship, well forward. A coil has been designed which will enable observations to be made in frequencies extending over a band of from, approximately 600 to sixteen kilocycles. If this installation is made satisfactorily, it will be the first time a Radio compass has been successfully installed upon a lighter-than-air craft.

Give WBAP's "Hired Hand" Miniature of His Cowbell

Miniature of His Cowbell
FORT WORTH, TEX.—G. C. Arnoux,
Radio Editor, Star-Telegram, Fort Worth,
Texas, alias announcer GCA or "The Hired
Hand," who daily wields the cowbell before the microphone of WBAP is proudly
displaying a miniature gold cowbell, patterned along the style of the original. This
unique token is inscribed "From Gainesville 147-piece Boys' Band, C. C. Shell,
Director, to 'The Hired Hand'." It was
presented to the popular announcer by
the band which was heard several weeks
ago, broadcasting from Station WBAP, and
complimentary acknowledgments were received by the Gainesville, Texas, band from
nearly every State in the Union.

Premier Radio Products

Are all their name implies

Why not begin standardizing now?

Variocouplers Transformers
Rheostats
Potentioneers
Head Sets Resistances "Microstats"
Dials and Knobs
Condensers Jacks Plugs

Correspondence solicited from responsible distributors

Write today for Radio "Parts" Bulletin.

Premier Electric Company

Established 1905 3810 RAVENSWOOD AVENUE CHICAGO, ILL.

"Radio Eye" Guide for London Derby Traffic

Flying Scouts Flash Road Conditions to Grandstand Box

LONDON, ENG.—Radio waves again controlled the immense tide of traffic that rolled into Epsom for the derby recently. From a box in the grandstand one man observed to see just what was happening to the streams of vehicles for twenty miles around. The trek to Epsom began the night before the race and from dawn until the classic was run there was a steady infux by all roads.

This man was able to see through the eyes of his Radio scouts, some of whom were flying over the course, and others touring the approaches in automobiles. Each was in direct communication with the "master eye."

Col. Laurie of the British air ministry, who was in charge of Radio communication at the course, declared that this was the second time Radio had been so used, and had proved very satisfactory.

CUNNINGHAM TUBES REPAIRED

1 U-200.
C-201 or UV-200.
C-201 or UV-200.
C-201 or UV-202.
C-201A or UV-201A.
3.6.
Moorehead Detectors.
5.7
Moorehead De

RADIO TUBE CORP.

Halsey Street Newark, N. J.

TUBES SENT PARCEL POST, C. 0. D.

for W.D.11 tubes

Standard for well-ber Willarde Speciarly a. for use with WD-11 Tubes. Supply current at 2 voits to one WD-11 Tube for 210 hours on a single charge. Rechargeable. Brand new, size 4x5½x7 inches—Chi-Rad guaranteed.

2-Volt Willard Charged...\$7.50 2-Volt Willard Dry..... 6.50

These same Willards can be adapted to deliver 8 volts for pure D. C. for C. W. Transmitters. Better than a generator because no filter is necessary. Much less expensive.

In lots of 40 (320 volts).\$160.00 (Better prices on larger quantity) Specify dry or charged when ordering

Chicago Radio Apparatus Co. 415 S. Dearborn St., Chicago, III.



World's Smallest Regenerative Set

How to Construct Vest Pocket 800-Mile Tuner

By Warner Bates

By Warner Bates

THE world's smallest regenerative set! Much interest has attached to the recent announcement of the construction by Roslyn V. Russell, Niagara Falls, N. Y., of a peanut tube miniature regenerative set which can be carried in the pocket and yet will do all that could be expected of many larger and more complicated outfits. Mr. Russell completed the set during the winter and under favorable conditions listened in on broadcasting stations and amateurs in all but the sixth and seventh Radio inspection districts. A portable set indeed!

Dial Container Is Cabinet
Mr. Russell ordered a Sleeper dial and
when it was delivered he found it housed
in a wooden box 8½ inches square by 1%
inches deep. On receipt of the box the
idea struck Mr. Russell that he could by
ingenuity design a receiver to fit in the
container.

ingenuity design a receiver to fit in the container.

The corners were reinforced by small \(\frac{9}{3}\)-inch triangular blocks of wood with holes through their centers through which screws were passed to fasten the panel on the front of the box. A \(\frac{9}{3}\) by 2\(\frac{9}{3}\)-inch hole was cut out of the back to pass the end of the sub panel which carries the three battery binding posts.

The panel is of \(\frac{9}{3}\)-inch bakelite, 2\(\frac{3}{4}\) inches square. The sub panel is fastened to the front panel by two 8-32 flat head screws and is 2\(\frac{1}{3}\) inches wide by 2 inches deep.

Single Circuit Begenerative

Single Circuit Regenerative

The circuit used is an improved regenerative single circuit using a spider web coil tuned by a vernier variable condenser and a switch on the antenna inductance.

MINIATURE APPARATUS COMPARED TO WATCH



Winding and Connecting Spider Web Fastened to the outside of the variable condenser by means of scaling wax at various points is the spider web coil. (See

AND

TAP SWITCH

end of the wire is connected to the grid condenser and leak and the fixed plates of the Variadon. The turns of the inductance after winding were doped with M-R No. 11 varnish. After this had dried thor-oughly the pins and former were removed. Figure 4 illustrates clearly the method of winding and of taking taps.

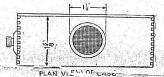
Tube, Socket and Grid Leak

The tube used is a Northern Electric 215-A "peanut" with socket made by the same firm. To get the socket into the case it is necessary to trim the sides until the width is only 1 inch. The socket is mounted on the sub panel and a tubular

%-inch long by %-inch long by %-inch diameter is fastened directly to the grid binding post of the socket.

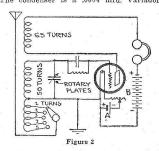
Mr. Russell made his own grid condenser and leak from a small rolled paper condenser mounted inside a hard rubber tube with brass plugs on each end and with a pencil mark leak extending from one brass plug to another on the outside surface of the hard rubber tube. It is not necessary, however, to follow this practice as very small grid condensers and leaks are available on the market and will serve satisfactorily here.

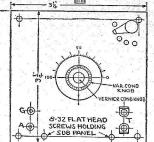
(Continued on page 6)



PEEPHOLE ø

FRONT, PANEL REMOVED.





FRONT OF ASSEMBLED PANEL Figure 1

The tickler feedback has fixed coupling. Figure 4). This inductance is wound on Figure 2 shows the hook-up used and the number of turns in each part of the spider web coil.

As was stated, the secondary is tuned by means of a vernier variable condenser controlled by a vernier dial (small knob in the center) in the center) in the center) in the center of the panel. The condenser is a .0004 mfd. Variadon

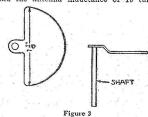


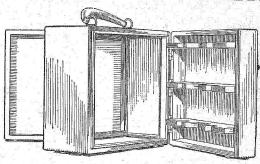
Figure 2

which was cut down from its normal 34inch diameter to a size 314 inches square
without, in any way, impairing its
efficiency.

The shaft of the Variadon was drilled
through the center to take a 1-18-inch
brass rod, and a specially shaped brass
vernier plate, shown in Figure 3 was
soldered to the vor, which in turn was
attached to the vernier knob of the dial.

Inland Electric Co. Chicago

A RADIO SUMMER?



Brown mahogany finish portable cabinet, both front and back hinged, shelving in rear cover to fit No. 705 Flashlight "A" Batteries and No. 763 "B" Batteries; enough space for 3-tube set; head set fits in front cover, aerial in back. Complete, \$15.00.

We are distributors for Atwater-Kent Radio Equipment and maintain a complete stock at all times.

IF YOUR DEALER HASN'T GOT IT, WE HAVE INLAND ELECTRIC CO.

14 N. FRANKLIN ST.

CHICAGO, ILL.



HOW AMATEUR CAN AID NATION IN WAR

INTERCEPT MESSAGES OF ENEMY AT FRONT

"Qualify in Radio—No Better Way to Serve," Says Signal Corps Officer

WASHINGTON.—There is practically no end to the possibilities of Radio for military use, an officer of the signal corps stated recently, adding that, young men who wish to serve their country can do so in no better way than to become qualified in Radio and to join the National Guard or Signal Reserve Corps of the U. S. Army.

of the 400 Radio men engaged in intelligence work were ex-amateurs. Not a single "leak" occurred in the service, which intercepted 73,000 enemy messages and recorded 175,000 bearings on enemy Radio stations. The country is greatly indebted to these amateurs for their war work.

Radio Intelligence Work

Radio Intelligence Work

Although little was known of the work
of the Radio intelligence section of the
army during or since the war, it was one
of the most spectacular. Radio direction
finders were placed all along the lines, at a
distance of about five miles from the actual front and spaced about twelve miles
apart. These receiving sets located the
enemy stations in operation, recorded their
learnings by means of directional coils, not
unlike modern Radio compasses, and forwarded the bearings to headquarters where
they were plotted on maps. The reports
from many American Radio observers enabled the staff to keep an accurate check
on practically all the German stations all
the time.

Other receiving stations at army headquarters, intercepted and copied all enemy
ode messages, and telegraphed them back
to general headquarters where code experts worked them out, giving the staff
valuable information as to the movements
or intentions of the enemy.

German's Make "Faux Fas"

valuable information as to the movements or intentions of the enemy.

German's Make "Paux Pas"

On one occasion, when the Germans were planning a big offensive, the code all along the line was suddenly changed. The old code, known by the Americans for some time, became valueless. But one German officer could not dectaher a long resumption of the conduction of the conduc

Vernier Var. Condensers COMPLETE WITH KNOB AND 3 IN. RUBBER DIAL

\$5.00 Value 11 plate with 3 plate Vernier...\$2.00 5.50 Value 19 plate with 3 plate Vernier... 2.15 6.50 Value 41 plate with 3 plate Vernier... 2.50

 Plain—
 Plain—

 3 Plate
 \$0.75

 23 Plate
 \$1.25

 11 Plate
 .98

 43 Plate
 .1.50

Include 5c per item for parcel post.

CHI-CITY-RADIO CO. 945 CRESCENT PLACE, CHICAGO, ILL.

ORMICA Alaminated Phrnolic Condensation Product
SHEETS TUBES RODS

RADIO PANELS

POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

 $\frac{y_{32}^{"}}{1}$ THICK $\frac{y_{24}^{"}}{2}$ PER SQ.INCH $\frac{y_{16}^{"}}{3}$ THICK $\frac{3}{4}$ PER SQ.INCH $\frac{y_{32}^{"}}{3}$ THICK $\frac{1}{2}$ PER SQ.INCH

1/8" THICK 1/2° PER 5Q INCH 3/6" THICK 2° PER 5Q INCH 1/4" THICK 2/2° PER 5Q INCH 3/8" THICK 4° PER 5Q INCH 1/2" THICK 5/4° PER 5Q INCH

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

STARRETT MFG. CO.

BRITAIN AIDS JAPAN TO BAR U. S. RADIO

Marconi Company's Six Gigantic Stations Will Establish Complete World Monopoly

SAN FRANCISCO.—Great Britain is using its diplomatic influence at Peking to aid Japan's opposition to the entry of American Radio companies to China, according to Emmett White, attorney, writer and former director of the insular and foreign division of the American Redi Cross in China, who arrived from the Orient recently.

It is believed by American residents of Shanghai, says White, that with the completion of six gigantic stations reported to be under construction in England by the British Marconi Company, Great Britain hopes to establish a complete world monopoly of the air, assisted by Japanese stations in China and Manchuria.

The Federal Telegraph Company of this city is keeping the cables and telegraph wires busy with appeals to Washington, urging that the State Department take action on the reported refusal of the defacto government at Peking to live up to the terms of an agreement permitting the installation of Federal Radio stations at six Chinese ports. SAN FRANCISCO.-Great Britain is

Fort Worth Bids for Third Big G. E. Plant

Location in Southern U.S. Held as Inducement

FORT WORTH, TEX.—The tremendous Radio interest in the territory for hundreds of miles around Fort Worth, largely developed through Station WBAP, and the fact that Fort Worth is near the center of the southern half of continental United States, is offered as an inducement in bidding for the third huge broadcasting station which the General Electric Company is slanning.

tion which the General Electric Company is planning.

The ordinary service radius of a station of this kind would be more than 1,500 miles. A similar station is now being erected at Oakland, Calif., and the parent station is WGY, Schenectady, N. Y.

Place Radio in Hospital

W Ju. Journal Mercousts NEW YORK.—A complete Radio outfit with more than 150 headsets is installed in Beth Israel hospital for use of the patients. Louis J. Frank, superintendent, said he believed Radio would diminish the giving of narcotics and sleeping potions and ease the patient's mind.

Cockaday Circuit FUNER COILS BC AND D COILS Complete as per specifications TUNER

No. 18 Wire Used-D Coil Bankwound. Price, \$2.75

Hook-up, directions and material list furnished free with each set of coils. MAIL ORDERS FILLED

Eastern Radio Mfg. Co. 2Z Warren St., Dept.R.D., New York, N.Y.



Every World User Is a Booster

Because you deal direct with a manufacturer who is responsible for the performance and quality of the Battery.

World-Radio-Batteries

Volts-40 Amps., 6 Volts-80 Amps \$8.50 \$12.50

Volts-60 Amps., 6 Volts-100 Amps., \$10.00 \$14.50 6 Volts \$16.00 120 Amps.

Full Rating Guaranteed
MAIL YOUR ORDER TODAY. WE SHIP
EXPRESS C. O. D., SUBJECT TO INSPECTION, OR WILL ALLOW 5% FOR GASH
WITH ORDER. ALL ORDERS SHIPPED
SAME DAY AS RECEIVED.

WORLD BATTERY COMPANY, 60 E. Roosevelt Rd., Dept. L, Chicago, Ill.

SMALL REGENERATOR

(Continued from page 5)

Rheostat Homemade

Because there is very little space on the canel the filament rheostat is fastened on

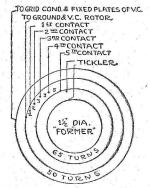


Figure 4

Figure 4

the left side of the case. There being none small enough on the market, the rheostat is made from a piece of %-inch diameter hard rubber rod, ¼-inch thick, and grooved on its outer edge to take the resistance wire coil. The contact blade is %-inch long and is turned by a %-inch knob and dial 1½-inch in diameter mounted in the center on the left side of the case as shown in Figure 1.

The peephole in the top of the case consists of a hard rubber ring, 1½ inches in diameter, below which is fastened a circle of nickel plated screen.

Special Sets Made to Order

Let us quote you on any circuit. Sets made under expert supervision. We repair sets and test tubes.

FORBES RADIO CO. 127 N. Dearborn St. Chicago, Ill. - 2²4

Crystal Fans Wake Up

"The Vacuum Tube's _____val"



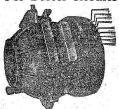
RADIO CORPORATION OF AMERICA OPERA-TIVES use the L. D. R. Crystal as detector in tion. Scilistaction Guaranteed or money refunded.

JACK BINNS OF S. O. S. FAME

Radio Ed. Tribune Radio Laboratory, ceently awarded a certificate of societies to the property of the societies of the property of the pr

JAYNXON LABORATORY

Kellogg Radio Equipment For Better Results



VARIOCOUPLER

The Kellogg variocoupler is of the same standard design as our variometer, being made of molded Bakelite, with reinforced construc-

With No. 502 Diamond Wound Coil, as shown in illustration....\$13.00

Kellogg Switchboard & Supply Company CHICAGO

Front Fanel Assembles

The front view of the assembled panel is shown in Figure 1. The antenna switch is in the upper right corner of the panel, surrounded by five contact points. In describing the winding the contacts were referred to as first, second, third, etc. First means the contact nearest the top, while the fifth contact means the one farthest to the right.

First means the contact nearest the top, while the fifth contact means the one farthest to the right.

The two lower left binding posts marked G and A are for ground and aerial respectively, while the two lower right binding posts equipped with phone tip clips are for the headset.

It is well to note here that the ground binding post and the aerial switch lever screws go through the screw holes in the Variadon, thus serving to fasten the latter to the front panel.

The four holes in the corners of the panel pass the brass machine screws, fastened through the reinfrorling blocks in the corners of the case, and small knurled knobs fasten to these screws to hold the panel and attached apparatus in the case.

This remarkable miniature regenerative set occupies an extremely small space and has excited great interest in Radiophan circles, not only on account of its size but because it has consistently received stations 500 miles away.

A meter is equal to 39.37 inches.

A meter is equal to 39.37 inches.

TWO SUPERSENSITIVE CIRCUITS

TWO SUPERSENSIIVE CIRCUITS

My Highty maryow of Reinart borings in all important antique in the control of the



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

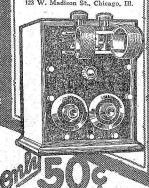
ALL DETAILS FOR ASSEMBLY

Description of apparatus and accessories and details of tuning. CABINET DIMENSIONS PANEL LAYOUTS LIST OF PARTS

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

Book Department

Radio Digest 123 W. Madison St., Chicago, Ill.



The Week's Advance Broadcast Programs

Tuesday, June 19

CFCA (Eastern, Dylight Saving, 400), \$360-300 P. M.

Stasied program, "The Hills of Donegal," Archibaid Munro, bartione, "Luna," Orchestria: Yiolin, 300, Mamile Roth; Selection from "June Love, Orchestria: The Hills of Donegal," Archibaid Munro, bartione, "Luna," Orchestria: Yiolin, 300, Mamile Roth; Selection from "June Love, Orchestria: Controller, "The Program Dance, No. 11, Manuile Roth; Three for Jack," Archibaid Munro, "Canponeta, Orchestria, "Eugerlan Dance, No. 11, Manuile Roth; Three for Jack," Archibaid Munro, "Canponeta, Orchestria: 22-03-30 P. M., Musical matinee, Georgia Statek, \$300-100 P. M., Concert, Raismatinee, Georgia Statek, \$300-100 P. M., Concert, Southern California Saxonnone Band.

KND (Contral, 545), 530-07 P. M., Program by Choir of KYW (Central, Daylight Saving, 345), 300 P. M., Musical program, Laure E. Burlin, sopram: Lucili Mankey, Coppender, Stetch, "The Proposal," from "Taming of the Shrow," Resury High School, River Forest, Ill Word, "Rost High School, River Forest, Ill Coppender, Stetch, "The Proposal," from "Taming of the Shrow," Resury High School, River Forest, Ill Coppen Seater, 1988, 1989, 1980,

man; 3:200 P. M. Boy Scoul period, 1907 Schul, Panda, Chery, C. Davis, Melver Davis Believes Stratford Orchestra.

Graph, 2012 Davis Believes Stratford Orchestra.

Graph Davis Merce Davis Believes Stratford Orchestra.

Graph Davis Mrs. Raiph, Jeockin, Schenectady Woman's Club; 7:36 P. M., Address.

Work English, 1912 Mrs. Y. State Conservation Commiss.

Work Instrumental Guartet. "Spartacus to Commiss."

Work Instrumental Guartet. "Spartacus to the Gladiators. John N., Donovan reader: The Giorno in Veneza." "Milot." Enfloy Pickett, burlione: "Canzone Amoroso." "Milot." Address. "Charles," Leftor Pickett, burlione: "Canzone Amoroso." "Milot." Address. "Charles," Leftor Pickett, burlione: "Canzone Amoroso." "Milot. Address." Charles, "Leftor Pickett, burlione: "Canzone Amoroso." "Milot. Address." Charles, "Leftor Pickett, burlione: "Canzone Amoroso." "Milot. "Address." Charles, "Leftor Pickett, burlione: "Charles," Leftor Pickett, burlione: "Address." Charles, "Leftor Pickett, Burlione: "Milot." "For You Adone." "My Jeannie," Leftor Pickett, Burlione: "Address." Charles, "Leftor Pickett, Burlione: "My Jeannie," Leftor Pickett, Milot. "For You Adore." "My Jeannie," Leftor Pickett, Milot. "For You Adore." "My Jeannie," Leftor Pickett, Milot. "For You Adore." "My Jeannie," Leftor Pickett, Milot. "Hermezon Davish Malot. "For Correct Canzon." "My Jeannie," Leftor Pickett, Milot. "Hermezon Davish Malot. "For Correct Canzon." "My Jeannie," Leftor Pickett, Milot. "Hermezon Davish Malot. "For Milot. "My Jeannie," Leftor Pickett, Milot. "Hermezon Davish Malot. "My Jeannie," Savophone solos, Gardier J. Milot. "Hermezon Davish Malot. "My Jeannie," Savophone solos, Gardier J. Milot. "Hermezon Davish Malot. Charles, 2012 My Malot. Charles, 2012 My My Leftor Savophone solos, Gardier J. Milot. "Hermezon Davish My Leftor My My Leftor Savophone solos, Gardier J. My My My Leftor Savophone solo

W.M.C. Cowrigh, 400. 8-50. P. M.: Program arrival and Mrs. Garnes Sricklands 1 3000. F. M.: Milliands W.O. (Cortral, 484), 3:30 P. M.: Educational talk. A. G. Hintichs: 535 P. M.: Culmer, someon. 700-11:30 A. W.O. (Eastern. 535). M. Culmer, someon. 700-11:30 A. W.O. (Eastern. 545). M. C. (Eastern. 545). M.

Wednesday, June 20

CF 64 (Eastern, Daylight Sayling, 400), 8:80-9:50 P. M.,
Natical prooffine, "In the Tayern," Star Orchestra,
"Carnival of Ventice, "Stelle Fox, soprano, "The
Robert Direct of Ventice, "Stelle Fox, soprano, "The
Robert Direct of Albers," Source, or Albers,"
Robert Direct Stelle Fox, "Source," or Albers,"
Robert Direct Stelle Fox, "Source," or Albers,"
Bettelle Fox, Stelle Fox, Soprano, "The
Bettel Land," W. Woods, cornelist; Soprano solo,
Estelle Fox, Stelle Fox, Soyrano; "The
Rettelle Fox, March Torne, "Solle Fox, Soyrano; "The
Rettelle Fox, March Torne, "Solle Fox, Wastell matthews,"
Rettelle Fox, March Torne, "Solle Tolle, Mystell matthews,"
Rettelle Fox, March Torne, "Solle Tolle, Mystell matthews,"
Rettelle Fox, March Torne, "Solle Fox, Wastelle Mystelle
Robert Stelle Fox, "Concert, Ventice America, Dind,"
(SS) (Central, Soll, 300 of Mystella Mystella Mystella
Robert Stelle Fox, "Concert, Rolary Club of Independience, Kans.,"

liams; 8:45 P. M., Concert, Botary Club of Independence, Kale Douglight Saving, 3:45), 3:00 P. M., Wilseld program, Em. Marzo Ort, soprano; Max Bogoliu, Saving, 3:45), and Starmen, contration Rose Bogoliu Georgies Courtuils, baritone; Cope Harrey's Corchestra; Wendald W. Hall, KXW's Musica Maker Countral, 4:30, 9:36-16:30 P. M., Concert, E. WEAP Countral, 4:76), 9:36-16:30 P. M., Concert, E.

Stein., planist: Georgies Coutrulis, bartione; Cope Harvey's Orchestra; Wendal W. Hall, KYW's Aussi-Marker Contral, 478), 9:30-10-30 P. M., Concert, E. Cliyde Whilingot's violin emsemble. 393, 12:30-12:54 P. M. Concert, E. M. Dark (Eastern, Daylight Sawing, 2009), 200-12:54 P. M. Concert, E. M. Concert, C. M. Concert, E. M. Concert, M. C



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Musical program, Rosemar Ellerbrock; Children's play "Attile Boy Blue Bird," Students of Reulman School, of Expression; William Stoses, violinist, Concett, "Spirit Plower," Hickard Pawer, herory, "Vision Plower, Therman Taylor, of Expression; William Stoses, violinist, Concett, "Spirit Plower," Hickard Pawer, herory, "In the Dark," "Program of Darkin," Richard Pawer, Herbert O. Schatz; William Stoses, violinist, "Give a Man a Richard Richard, "Rechreit," "Rechreit, "Spirit William Stoses, violinist," "Rechreit, "Rechreit,

What Time Is It?











HE above clock dials are shown to clear up the misunderstanding which the various time bands and the Daylight Saving plan are creating. Although each dial registers time one hour ahead or behind of its neighbor, the exact period indicated on each dial is the same as that on every other. This chart will aid in the use of the advance programs and the schedules in the Radiophone Broadcasting Station Directory, both of which give the hours stated in the particular kind of time in use at each station. Only features are listed in the advance programs below. Much additional data and such parts of station schedules as are regular features week in and week out, will be found in the station directory which appears scrially continuously on page eight.

"Tally of Killiamory," "The Moon Has Raised Her Lamp Above," Richard Favey, Herbrit O. Schatz. P. WMAG (Central, Dowlight Savins, 471, 730-530 and Contral, Dowlight Savins, 471, 730-530 and Contral, Dowlight Savins, 471, 730-530 and Chicago Schools Committee; Eleanor Schweitzer, sorranc; Mrs. Helene Uhlir, rioliniat; Helen Brown, pinnist; 315 F. M., George J. Hill, Jr., bartions! WOC (Central, 484), 3:30 F. M., Educational talk, D. K. Kirk; 830 F. M., Organ recital, Mrs. Frank W. Elliott. 10:30 F. M., Musical program, Talent from WOO (Castern, Daylight Savins, 509), 11:00-11:20 A. M., Organ recital, Mary B. Vogt; 728 F. M., Musical program, 18:45 F. M., Musical program, 18:45 F. M., Dance music, Helel Adolphia Ornbestra, A. Gandelorf, Mrs. M. (Crant Feelal, Mary E. Vogt; 738 F. M., Becklati. 3:15-4:45 F. M., Musical program; 8:45 F. M., Dance music, Helel Adolphia Ornbestra, A. Gandelorf, WWJ (Castern, 517), 8:30 F. M., Concert, News Orchestrie; Town Crier: Mrs. Violet Hunter, planist; Generatives Zeinner, soprano; Herbert Lamb, bartions.

Thursday, June 21

GFCA (Eastern, Davlisht Saving, 400), 8:00-9:00 P. M.;
Missical program, "Mirolia," Start Orchestra, 1999.
Missical program, "Mirolia," Start Orchestra, 1999.
Missical program, "Mirolia," Start Orchestra, 1999.
Gill, sopratue, "Largy Adaskin, violusia, "Amonopolic Contestina, "Tampo, Harry Adaskin, violusia," "Amonopolic Contestina, "Tampo, Harry Adaskin, "Mornia, "Amonopolic Contestina," "Mirolia, "Largy Adaskin, "Mornia," Nelly Gill, "Extaso," orchestra, "Amonopolic Contestina, "Nelly Gill, "Extaso," orchestra, "Mirolia, "Miroli

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Maier, fluist; "Arabesque" Mariory Garrigus; "Fishend of "Far Not Ve Brand. Miscory of Rend. Miscory Hungarian Serenated, "Googe Maier, "Burecus," Serenated, "Googe Maier, "Ruse of My Heart, "Rose in the Bud. Miscory of Mi

Friday, June 22

CFCA (Eastern, Daylight Saving, 400), 8:00-9:00 P. M.,
Musikal-program Selection from "Oppy Love." Star
Orchestra. "Nevrana, "Frederica Engerty, Jacobs,
"Demoisele Chic." "Jamping The Star County of St

SAVE MONEY BY MAIL

 Ames Shielded Audio Trans.
 \$2.90

 All American Radio Trans.
 4.00

 2200 Ohm Phones.
 3.25
 VARIOCOUPLERS

FLEWELLING, REINARTZ and other diagrams are shown in our latest catalogue together with other Radio information. It will be sent to you for 10c.

Fremont Radio Sales Co. 227 Fulton St.

KSD (Cental, 540), 8:00 P. M., Opera, "Prince of RIBSEC," Ministry III.

KYW (Gentral, Daylight Saving, 345), 8:00 P. M., Musical program, Mabel Timms, sopraine, Homer Coddington, battlone; Lewis Mechan, tener; Bernies Solivation, Control of March 1998, 1998

reader; A. D. Decese, National Content of the Conte

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BRIGHT STAR—No. 15-65—62½ V. 1.75
BRIGHT STAR—No. 15-65—62½ V. 10.75
BRIGHT STAR—No. 15-625—20½ V. 10.75
BRIGHT STAR—No. 15-625—20½ Volts. \$0.90
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Radiophone Broadcasting Stations

RADIO DIGEST

Corrected Every Week-Part I

AQ6, Canton, O. 425 meters, 500 mi. Hdqtrs. 135th Field Artillery O. N. G. Wed, Fri, music. Sun, AGG, Canton, O. 225 meters, 500 ml. Hotter. 185th. Field Artillery O. N. G. Wed, Fr. Hotter. Sun, church services, Eastern 50 meters, 200 ml. U. S. Army, Fr. Sam Houston. Man, Thurs, irregular, Avr., St. Paul, Minn. 400 meters, 500 ml. U. S. Army, Fr. Sam Houston. Man, Thurs, irregular, Avr., St. Paul, Minn. 400 meters, 500 ml. 6th. Int. Avr., St. Paul, Minn. 400 meters, 500 ml. 6th. Int. St. Paul, Minn. 400 meters, 500 ml. 6th. Minn. 5th. St. Paul, Minn. 400 meters, 500 ml. 6th. Minn. 5th. St. Paul, Minn. 400 meters, 100 ml. 6th. 100 ml. 5th. 100 ml. 5th. 100 ml. 6th. 100 ml. 10 GFGE, Hallfax, N. S., Can., 440 meters. 150 ml. Marconi Co. Mon. Wed. Sim night, music, entertaince of the control of the cont W. Grant Madio Ltd. (1971) B. C. Car. Radio Corp. of Van-couver, Ltd.

G. Can. Radio Corp. of Van-couver, Ltd.

G. Can. Marconi Co. No regular pro-Office of the matter of the control gram, CHCF, Winnipeg, Man., Can. Radio Corp. of Win-nipeg. Ltd.

Group C.

Glory C.

Glory

Sun. 3:30-14 pm. Contrail.

Stat. 3:30-14 pm. Contrail.

Stat. Sta

GROC. Hamilton. on the control of th

KDZG, San Francisco, Calif. 360 meters. Cyrus Pierce & Co.
KDZI, Wenatchee, Wash. 350 meters. 700 ml. Elec.
KDZI, Wenatchee, Wash. 350 meters. 700 ml. Elec.
Mon. Wed, Pri. 8-9 pn, music. Sun, 11 am -12:300 ml.
Mon. Wed, Pri. 8-9 pn, music. Sun, 11 am -12:300 ml.
KDZI, Reno, Nev. 360 meters. 50 ml. Nevada Maconico.
KDZG, Denver, Colo. 360 meters. 791e & Nichols.
KDZG, Denver, Colo. 360 meters. Pyle & Nichols.
KDZG, Denver, Colo. 360 meters. Pyle & Nichols.
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KDZG, Denver, Colo. 360 meters. Scattle Radio Ass.
KDZG, Denver, Colo. 360 meters. Scattle Radio Ass.
KDZG, Stattle, Wash. 360 meters. 1,500 ml. State.
KDZG, Stattle, Wash. 360 meters. 1,500 ml. State.
KDZG, Stattle, Wash. 360 meters. 1,500 ml. Western.
KDZG, Denver, Colo. 360 meters. 360 ml. McHetters.
KDZG, Denver, Colo. 360 meters. 360 ml. McHetters.
KDZ, Denver, Colo. 360 meters. 360 ml. McHet.
KDZ, No definite schedule. Univ. activities. Mountain.
KDZ, No definite schedule. Univ. activities. McMeters. KFAR, Holtywood, Calif. 369 meters. Studio Lighting Searlien Co. Searl

thedral. Sun, 11:15-12:80 pm, 8-9:15 church services. Mountain.

KF DF, Casper Myo. 380 meters. 600 ml. Wyoning Radio Corp. Duly ex Sun, 12:30 pm, weather, stocks. Mountain. 11:30 music. Mountain. Mountain. Mountain. KF DH. Tucson, Ariz. 360 meters. 200 ml, Univ. of Ariz. Tucs, Thurs, 7:30-3:30 pm, susci, lecture, reports. Mountain. lego. KFDL, Denver, Colo. 360 meters. Knight-Campbell Music Co.
KFDO, Bozeman, Mont. 360 meters. H. Everett Cut-McKee. KFDU, Lincoln, Neb. 240 meters. Neb. Radio Elec. Co.
KFDV, Fayetteville, Ark. 360 meters. 300 ml. Gli-brech & Stineon. Slogan. "Southern Gateway to the Ozarks." No regular schedule. Central. KFDX, Shreveport, La. 360 meters. First Baptist Church. KFDX, Shreveport, Las. 300 meters, Church.
KFDY, Brookings, S. D. 860 meters, S. D. State
College of Agri. & Moch. Arts. Mon., Sat, 8:30 pm.
music. Tues, Thurs, 11 am, music, lectures, news.
Contral.
KFDZ, Minneapolls, Minn. 360 meters. Harry O. Iver-KFÖZ, Minnespolls, Minn. 360 meters. Harry O. Iver201. Tet., Calif., 360 meters. 360 ml., City of Tali.
KM, Wed, Ftl. 613-7 pm. music, news. Pacific.
KFCC, Portland, Ore. 350 meters. 25 ml. Meier &
Frank Co. Inc. Daily ex Sun, 12 m. weather, reports;
5-10 pm. concert. Sat, 11 am 12 m., children's bour.
Facific.
Feet., Dearwir. Colo. 360 meters. Guy Grescon.
Daily ex Sun, 9 am. 10, 11, 11:45, stock reports; 3-4
pm. music. Mon. Frl. 9-10 pm. 12-1 am. concerts.
KFEF, Denver. Colo. 240 meters. Radio Zujupnost Co.
KFEF, Denver. Colo. 240 meters. J. L. Scrozgio.
KFEF, Fort Dodge, In. 231 meters. Auto Electric
Service Co.

KFHF, Shreveport, La. 266 meters. Central Christian Church.
KFHH, Neah Bay, Wash. 283 meters. Ambrose A. McCue. KFHI, Wichita, Kans. 224 meters. Charles V. Dixon. KFHI, Santa Barbara, Calif. 360 meters. Fallon KFHL. Oskaloosa, Ia. 227 meters. Penn College. KFHP, Kearney, Neb. 246 meters. Radio Bug Products Co. KFHR, Scattle, Wash. 270 meters. Star Elec. & Radio Co. KFI, Los Angeles, Calif. 469 meters. 2,000 ml. Earl C. Anthony. Inc. Daily ex Sun, 1-1:30 pm, 5-6 pm, 7-1:30 pm, 8-11 pm. Sun, 10:30-11:30 em, 4-5 pm, KFIB, St. Louis, Mo. 244 meters. Franklin W. Jenkans. KFIG. Denver, Colo. 224 meters. Phillip Laskowitz, KFIG. Denver, Colo. 224 meters. Phillip Laskowitz, KFIG. Jola, Kans. 246 meters. Ross Arbuckles Garage. Mon. Thurs, Sat., 7:30-5 pm. Central. KFIF, Portland, Ore. 360 meters. Benson Tech. Student Bel. S. D. 236 meters. Sidney I. Thorsen. KFIK, Gladbrook, Iowa. 234 meters. Gladbrook Elec. Co. Solvane, Wash. 252 meters. Sidney J. Troposale. Co. Solvane, Wash. 252 meters. Gladbrock Electrical Hirth School. Wash. 252 meters. North Central Hirth School. Wash. 252 meters. 200 mi. Vasima Will Make 242 Farnous." Dally er Sun, 758-Station Gmatwill Make 242 Farnous. Dally expension of the Make 252 Make 252 Meters. Denrer Park Amusement Co. KFKH, Lakeside. Colo. 228 meters. 200 mi. Decreased Communication of the Make 252 Make

Empire. Tues, Fri, 7:30-9 pm, music. Sun, 6-7 pm, Pacific.

Rab, Tacona, Wash. 360 insters. 200 ml. Racona, Pacific.

Rab, Tacona, Wash. 360 insters. 200 ml. Pacona, Pacific.

Rab, Tacona, Wash. 360 insters. 200 ml. Pacific.

Rab, Tacona, Wash. 360 insters. 300 ml. Pacific.

Rab, Torland, Torn, music. Pacific.

Rab, Torland, Tacona, Market, Pacific.

Rab, Torland, Tacona, Market, Pacific.

Rab, Torland, Tacona, Tacona, Pacific.

Rab, Torland, Tacona, Tacona, Pacific.

Rab, Tacona, Wash. 360 insters. 150 ml. The Honolulu Advertiser. Dally, 7:30-9 pm. Tues, Tiurs. Sat. speed, program. 150th meritain. CThree hours are partial. Phys. Co. Slogan, "KGW. Keep Growing woman's program, 7:30 pm, weather. Mon. Wed. Fri. Sep. pm, concert. Mon. Fri. 7:7:30 pm. lecture. 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, concert. Pacific. Owledge, Pacific. Phys. Rev. B. 10, 11-12 im. Hooc Owls. Sun, 7-5 pm, 200 in. Pacific. 11-12 im. Hooc Owls. Sun, 7-5 pm, 200 in. Pacific. 11-12 im. Hooc Owls. Sun, 7-5 pm, 200 in. Pacific. 11-12 im. Hooc Owls. Sun, 7-5 pm, 12-30-115 pm, 645-130, 5-10. Sun, 10-13 pm, 11-13-13-13 pm, 10-13-13 pm, 10-13-1

KNX, Los Angeles, Calif. 300 meters. Elec. Lighting & Supply Co.

KNS, Los Angeles, Calif. 390 meters. Elec. Lighting & Supply Co.

KOB, State College, N. M. 300 meters. 500 ml. N. M. Agri. & Moch. Arts. Daily 11:55-12 m. 9:55-10 pm. time, reports. Mon. Wed. Fir. 7:30-35-30 pm. con-Mountainten. 200 ml. Detroit. Polite Dept. Slogan. (Safety First." Daily ex Sun, 1 pm. 6:30, reports. police information, energency. Eastern.

Police Dopt. Slogan, "Safety First." Daily ex Sun, pm. 8:35. reports, police information, emergency. RPD. Stan Francisco, Calif. 423 meters. 1,500 ml. Hale Bros. Inc. Daily ex Sun, 4:30-5:15 pm, music. Tues, Thurs, Sat. 8-10 nm. concert, lectures. Sun, 1:1:3:30 pm, church services. Paddin. vio Calif. (1998) pm. concert, lectures. Sun, 1:1:3:30 pm, church services. Paddin. vio Calif. (QP, Hood River, Ores. 330 meters. Apple City Radio Cub. Slogan. 'Apple City of the West.' Daily ex Sat. Sun, 6 pm, news. Mon. Wed. Pri, 6:30 pm, music. Wed. 9 pm, special. Practic (CdV, Pittsburgh, Pz. 360 meters. 300 mt. Doubledar-Hill Else. Co., Daily ex Sun, 1:2-12:30 pm, +4:30-5-135 pm, children's program. Eastern. 'Fri, 4:30-5-135 pm, children's program. Eastern. 'Fri, 4:30-5-135 pm, children's program. Eastern.

4:30-5:15 pm, children's program. Enstern.
KQW, San Jose, Calif. 30 pm; etcs; 500 ml. Chas.
D. Heroid. Daily ex Sun, 1-1:30 pm. Wed, 8-9 pm; concert. Pacile.
KRE, Berkeley, Calif. 380 meters. 600 mi. Maxwell Decicle. Mon. 8-10 pm. Wed, 9-10 pm, concert.
KRE, Serkeley, Calif. 300 meters.

E aculio.

SD, St. Louis, Mo. 546 meters. 1,500 mi. St. Louis
Post Dispatch. Daily ex Sun, 8340 am, 9:40, 10:40,
11:49, 12:49 pm, 1:40, 2:40, 4, 8. Thurs and Sun,
silent nights. Mon, Fri. 11:30 pm, concerts. Central.

silent nightis. Mon. Frj. 11:30 pm. concerts. Central.

KSL, San Francisco, Calif. 366 meters. 50 mi. The Emportum. Temporarily discontinued.

Radio Co. No tentiar schedule. Readio Co. No tentiar schedule. KTW. Scattis, Wash. 386 meters. 590 mi. First Preshyterian Church. Sun. 11:12:39 pm. 3-4:39. KU. St. 11:12:39 pm. 3-4:39 pm. concert, time. St. 11:12:39 pm. 3-4:39 pm. concert, time. 3-4:4:39 pm. ode practice. Wed. Frl. 6-6:45 pm. concert. Pacific.

(NOTE-The second part of the station schedule list will appear next week.)

Serially Continuously—

THE BROADCASTING station directory is the most complete and authentic list of Radiophone plants. Letters are being sent various stations every day for information. No other paper or source provides the data given here. The idea is original and a service which Radio Digest has maintained from the start. Every public service broadcasting station is to be found now, not only in the location index, but in the schedule list. The latter, however is divided, one-fourth appearing this week, the second quarter to appear next week, and the third part the week following and the fourth will have the state, city and station index.

The station schedules given here are listed alphabetically by call letters. Following the call is given the city and state, the wave length, estimated sure miles range of the station, the owner's name, the slogan of the station if one is used, name of listener in "club," the schedule of operating hours, and the kind of time used.

The state, city and call list appears with the last week and is merely an index. One wishing to find the calls of the stations in his vicinity, will find this index useful. Three successive issues of Radio Digest will give one the most complete and accurate list of broadcasting stations

weather, news. Tues, Fri. 8-9:30 pm, music. Mountain. KFBG. San Diego, Calif. 278 meters, 500 ml. W. K. Azbill. Thurs, Sun, 8-9 pm, Bible lesson, sermon. Pacific.

r scure.

KFBD, Hanford, Calif. 360 meters. 200 mf. Clarence V. Welch. Mon. Wed, 3-4 pm. 7:30-8:30, news, must.c. arriograms. Tues, Thurs. Sat. 6-7 pm. must. Fri. 3-4 pm. 9-10, news, music. Sun. 7-8 pm, church services. Pacific.

services. Pacific. KFBE, San Luis Obispo, Calif. 360 meters. 50 mi. R. H. Horn. Mon. Wed, Fri, 4-5 pm. Wed. Fri. 7-7.30 pm. Pacific. KFBG, Tacoma, Wash. 360 meters. First Presbyterian Church. KFBH, Marshfield, Ore. 360 meters. Thomas Musical

tain. KFFE, Pendleton, Ore. 360 meters. 100 mi. Eastern Ore. Radio Co. Daily ex Sun, 8:30-9:30 pm, music. trait.

Fee. Pendicton, Ore. 368 meters. 109 mi. Eastern Pac. Radio Co. Daily ex Sun, 5:30-9:39 pm, music. Fee. Radio Co. Daily ex Sun, 5:30-9:39 pm, music. FFFO. Hillsboro, Ore. 360 meters. 500 mi. First Baptist (FFFO. Hillsboro, Ore. 360 meters. 500 mi. First Baptist (FFFO. Moberty, Mo. 275 meters. 500 mi. First Baptist (FFFO. Moberty, Mo. 275 meters. 500 mi. First Baptist (FFFO. Moberty) (FFFO. Series Colon, 1360 meters. 500 mi. First Baptist (FFFO. Series Colon, 1360 meters. 255 mi. eventuer. 1-5 pm, concert. Mon. Wed. FFI. 82-33 pm, special program. Mountain. 800 meters. 155 mi. mether. 16-5 pm, concert. Mon. Wed. FFI. 82-33 pm, special program. Mountain. 800 meters. 150 mi. Jim Kirk. 10-11 pm, special. Pacific. Mol. 11 pm, special. Pacific. Mol. 11 pm, special. Pacific. Mol. 11 pm, special. Pacific. 16-12 pm, special. Pacifi KFG1, St. Louis, Mo. 266 meters, Astonal Guards Missounitation, Ore. 324 meters, Artonal Guards Missounitation, Ore. 324 meters, Cheny Raddo Co. KFGC, Boone, La. 229 meters, Cray Hardware Co. KFGC, Hone, La. 224 meters, Cray Hardware Co. KFGC, Utica, Nebr. 224 meters, 50 mi. Heidbreiler Radlo Supply Co. No requiat schedule. KFGX, Orange, Text. 250 meters. First Presbrierian Church. Sun, 11 am, 730 pm, church services, Central.

KGY, Baudette, Minn. 224 meters. Gjelhaug's Radio ne GY, Baudette, Minn. 224 meters. Gjelhaug's Redie Shop.
K RGZ, Berrien Springs, Mich. 268 meters. Lemanud
K RGZ, Berrien Springs, Mich. 268 meters. Lemanud
Kilak Guntan. 200 meters. Colorado State
Normal School. "Where the Sun Shines Every Day."
Daily ex Sun, 3:30 am, weather, markets. Tues, 7:30
Daily ex Sun, 3:30 am, weather, markets. Tues, 7:30
meters and the sun and the

Store, Dally ox Sun, 5-6 pm, 7-8, music, Sun, 6-8, pm, Pacific Primaries, Culff. 569 meters, 1,569 mi, Marchael Trust, 60, Dally ox Sun, 10-11 am, weather, markets; 11-11:30, news, quotation; 2-3 pm, lectures, concerts. Mon, Wed, Fri, 8-10 pm, concert, West, Wed, Fri, 8-10 pm, concert, West, West, West, 10-10 pm, concert, West, West, 10-10 pm, concert, West, West, 10-10 pm, concert, West, West, West, 10-10 pm, concert, West, West, West, 10-10 pm, concert, West, We

Co. KFBK, Sacramento, Calif. 233 meters. 300 ml. Kimball-Upsou Co. Slogan, "Heart of California." Dally ex. Sun, 6-455 ym, concert, news, codes. Wed. S-9-35 mn. cancert. Sun, 10-11 am, church service; 8-9 pm. KFBL. Exerett, Wash. 224 meters. 50 ml. Leses Bros. Daily ex Sun, 7:15-8:15 pm. Sun, 2-3 pm. Eastern. KFBS, Trinidad, Colo. 350 meters. Chronicle News & Gas & Elec. Supply Co. KFBU, Laranibe, Wayo. 369 meters. Bishop N. S.

KDPT San Diego, Lillia ou mints. 7720 µm. Shews, weather, concerts, lecture, Tues, Sat, 8-10 pm. Pacific.

KDYL, Sat Lake City, Tith. 350 meters, 1,500 ml. State, and the properties of the pro Angeles union and 4-4:30, 8-8:20, new and 13-12:26 pm. 4-4:30, 8-8:20, new and 14-12:26 pm. 16-12:16 pm. 16-1 kets, entertainment. Central. Central. KFCY, Le Mars, Ia. 360 meters. 300 ml. Western Union College. Fri, 8-9 pm, music, educational. Union College. Fil. Central. KFCZ, Omaha, Neb. 360 meters. Omaha Central H. S. KFDA, Baker, Ore. 360 meters. 25 ml. Adler's Music Store. Daily ex Sun, 5-6 pm, 7-8, music. Sun, 6-8

ADVANCE PROGRAMS

(Continued from page 7)

Organ recital, Mary E. Vogr: 12.90-12.55 F. M.,
Luncheon music, Tea Boom Orchestra; 435-5:00 P. M.,
Organ recital, Mary E. Vogr: 7:45-9:00 P. M.,
Oncert, WOO Orchestra, Robert E. Golden, director;
9:30 F. M., Organ recital, Mary E. Vogr.
WW (Eastern, 377), 8:30 F. M., Concert, News Orchestra; Town Crier; William M. Schumaker, tenor; C.
Bruce Myerg, battione; Mrs. Era Derlitiger, soyrano.

Saturday, June 23

Gea (Eastern, Daylight Saving, 480); 5:00.0:00 F. M.;
Masical rengram, Subcettan (Fam.) H. 20.5 p. parform,
Star Orchestra; Ernest Morgan, barlone; "Yakoe
Bluette," Orchestra; "Dutil the Dawn," W. Woods,
cornolist: Ernest Morgan, barlone; "Peer Gynt,"
Head of the Breek Morgan, barlone; "Peer Gynt,"
Woods,
cornolist: Ernest Morgan, barlone; "Peer Gynt,"
Head of the Breek Morgan, barlone; "Peer Gynt,"
Head of the Breek Morgan, barlone; "Peer Gynt,"
Head of the Breek Morgan, barlone; "Mignoneste,"
KYW (Gentral, Daylight Saving, 345), 8:30 M., M.,
Cope Harvey, Orchestra; 9:25 P. M., "Under the
Evening Lamp," Youth's Companion.
Head Protein, 475), 7:00-7:30 P. M., "Under the
Evening Lamp," Youth's Companion.
Head of the Breek Morgan, Barlone, Breek Morgan,
Head of Grenter, "Arraire of the Heart." Betty
Lozan; 4:30-6:30 P. M., Dinner music, Uso Savino's
Orchestra from Cafe LaRiviers; 7:30 P. M., 3:00 P. M.,
WFAA (Contral, 475), 12:30-140 P. M., Address, "Current History Comment." Prof. Cyde Bagleton, Southem Mocholist University S. 260-930 F. M., Oncert,
Music, East Texas State Teachers' College, Commerce,
Texas; 1:40-12:30 P. M., Recital, Paul Van Karwijk,
WFI (Eastern, Daylight Saving, 509), 13:00 P. M.,
Musical program; 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 4:00-5:00 P. M., Concert, May
My Can Contral, 4:00, 8:30 P. M., Concert, Morgan recital and musical program; 10:10 P. M.,
Organ recital an

Sunday, June 24

WBAP (Central, 476), 11:00-12:15 P. M., Church services, First Methodist Church, Rev. J. W. Bergin, pastor.

"DAR Fastern, Daylight Saving 365), 1:00 P. M. The Menting of Courage, Rev. P. A. Machael Courth, A. M. Church Services, A. M. Courage, C. M. C

Monday, June 25

WBAP (Central, 475), 9:30-10:30 P. M., Concert, Hamblers Orchestra.

WDAR (Eastern, Daylight Saving, 355), 12:00-12:36 P. M., Concert, WDAR (Eastern, Daylight Saving, 355), 12:00-12:36 P. M. Dimer recital; 4:30-8:00 P. M., Musical program: "Affairs recital; 4:30-8:00 P. M., Musical program: "Affairs of the Heart," Besty Logarity, 730-8:00 P. M., Bed dayling the saving of the Heart, Besty Logarity, 730-8:00 P. M., Bed dayling the saving of the Heart of the

tist recital; 6:08-6:45 P. M., Danner music; Base-ball scores; 7:00-7:30 P. M., Bedtimo stories, Uncle Wit. WLW (Central, Daylight Saving, 309), 8:00 P. M., Concert, "Hilo Bay," "Old Fashioned Days," "Some-

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RADIOPHANS We are Manufacturers of SALS for CANOES BOATS & YACHTS Write for Prices and Information LOUIS J. LARSON, 45 Fulton St., N. Y. C.

body Else," Roger Hill Dance Orchestra; Walter Phillips, barttone; "Gypsy Lady," "Japanese Lullaby", "Please Don't Talk About Me When I'm Gene," Orchestra; Walter Phillips Orchestra; S. A. I. Trio; Songs, Elanore W. Mackey," Soyenti, "Cultarrene," WMG (Contral, 400), 839 P. M., Concert, Hoet Glosco Orchestra, Gasper Pappalardo, director. WOO (Eastern, Daylight Savina, 869), 1400-1130 A. Orran rectial, Mar B. Room Girchestra; 435-500 P. M., Organ rectial, Mary E. Vogt; 12:00-12:55 P. M., cert, John Wanamaker Commercial Institute Band, Artiur A. Rosander, director; 9:15 P. M., Organ rectial, Mary E. Vogt; 12:00-12:55 P. M., cert, John Wanamaker Commercial Institute Band, Artiur A. Rosander, director; 9:15 P. M., Organ rectial, Mary E. Vogt.

SPECIAL OFFER LIST

(Continued from page 2) tance Switch: 1 Martin-Copeland II-Point Inductance Switch: 1 Martin-Copeland II-Point Inductance Switch: Walnert Variable Gondenser (3-plate, 0,0006 mfd.); Ray-O-Vac Dr. Batter, 2 cells 1½ volts; Dubiller Ducor; Dubiller Micadon Type 640 (.006 mfd.); Dubiller Ducor; Dubiller Micadon Type 640 (.006 mfd.); Dubiller Sy-Pass Condenser (I mfd.), Premier Universal Radio Jack, Filament Control Fire Spring; CRL Variable Grid Leak, without condenser; Premier No. 250 Variable Resistance, panel mounting.

Class D Articles

For eight consecutive coupons and one dollar and

Sistance, panel mounting.

Ciass D Articles

For eight consecutive coupons and one dollar and twenty cents (\$1.20) any one of the following articles will be sent: 1 Carter 20-0hm Vernier Control Rheenat; Copeland 13-Point Inductance Switch; 1 Martin-Copeland 13-Point Inductance Switch; 1 Martin-Copeland 19-Point Inductance Switch; 1 Pattern Switch 19-Point 19-Point

Glass F Articles

For twelve consecutively numbered coupons and ondollar and eighty cents \$(1.50) the following will be sent: 1 Acme Pot-Rhee (potentiometer and rheostat) Walnart Variable Condenser (23-Plate .0005 mfd.) Ray-O-Vac No. 2151 B Sattery, 22% voits; Dublie By-Pass Condenser: (3 mfd.); Premier Variable Condenser without dial. (60098 mfd.).

Class G Articles

Class G Articles
For fourteen consecutively numbered coupons and two dellars and forty cents (\$2.50) any one of the following deleters and forty cents (\$2.50) any one of the following condensed. Federal 1. Plate Variable Condensers (1. Federal 1. Plate Variable Condensers (1. Federal 21. Plate Variable Condensers (1. Plate Variable Condenser With dial (. COU) m. (1.) Frenier Variable Condenser with dial (. COU) m. (1.) Frenier Legebog A. F. Transformer, 4 to 2 Ratto.

Class H. Articles

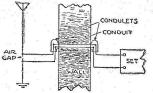
Class H Articles

Class H Articles

For sixteen consecutively numbered coupons and three dollars (83.00) any one of the following articles will be sent: 1, Federal Andlo Frequency Transformer No. 238 and the Frequency Transformer No. 238 Audio Frequency Transformer (12. Pass.) or R-41; Walnart Variable Condenser (13. Plate vernier; Valuart Variable Condenser) Battery 45 robig; Ray-O-Vac. Dr. Battery, 6 cells 1½ volts; Dubblier Duratran, (R. F. transformer); Frenier Condenser with vernier (1.004 midd.); Frenier Hegologa A. F. Transformer, 10 of Matto, Frenier Hegologa Condenser with vernier (1.004 mid.); Frenier Hegologa Condenser victor (1.004 mid.); Frenier He

Novel Lead-In Insulator

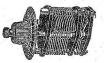
A piece of conduit %-inch longer than the wall is thick and two condulets make



a very neat and efficient lead-in insulator. The diagram is self-explanatory.—Lloyd Johnson, Liberty, Ind.

There are nights rare in winter, and common in the summer, when it is impossible to bring in distant stations. This is due to atmospheric conditions beyond control. This condition should be met philosophically as something that cannot be avoided, and not used as the basis of a complaint to the Radio dealer who sold you your set.

For Perfect Reception You Must Use



AMSCO

Vernier Condensers

They satisfy the most exacting. Perfect spacing, permanent adjustment—finished in white nickel.

13 plate\$5.50 23 plate 6.00 43 plate6.50 At All Good Dealers

AMSCO PRODUCTS, INC. Broome & Lafayette Sts., New York City

The Reader's View

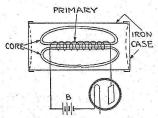
Talking Transformers

Talking Transformers

I have just read in the Digest for May 12 an article by a fan who, while presumably same and sober, heard volces coming out of his box without the use of phones. If he is an ordinarily cautious man, he wrote you anonymously, or under the non de plume "Munchausen" to avert a visit from a Volstead squad or a lunacy commission; yet I'm perfectly ready to believe every word of his tale, for I, too, can pull the plug out of my Flewelling set and she goes right on talking. Don't shoot! I'll come down! The explanation, as I have doped it out, is ridiculously simple and obvious when you think of it.

As surmised by the other fan, credit for the performance is due to an AF transformer, and I'll bet my last dollar (which is the only one the Radio dealers have left me) he has the same type of transformer as I, as only one kind will act in this manner.

This transformer is simply an enclosed type, with a figure \$ core, the shield being of iron in the shape of a cylinder. The whole affair looks like a black tin can about 2 inches in diameter and 3 inches long. Roughly sketched, its cross-section is like the one shown in the illustration.



You get it now, don't you? The plate current simply magnetizes the core, which attracts and vibrates the circular ends of the case, or drum. These ends thus become, in effect, diaphragms and the transformer simply a double-end telephone.

phone.
My fellow-lunatic will find that, in all phone.

My fellow-lunatic will find that, in all probability, this transformer couples his first and second stages, as the current from the detector tube is probably not powerful enough to vibrate these stiff disks audibly. He will also find that turning our the theosets, of the second stage will make the transformer "shut up," as this closes the secondary circuit in the transformer, allowing a current to be induced therein in the opposite direction from that passing through the primary coil, thus neutralizing the magnetizing effect of the primary on the core.

Thus, a "loud speaking transformer" could be easily constructed, but the secondary would be useless; that is, the "doodad" could not be used as a loud speaker and a transformer at the same time.

So you see this fan and I simply have a very inefficient built in telephone—inefficient because it was not designed for that purpose and the stiff case-ends work as diaphragms merely through what might be called coincidence.—L. B. Godbey, St. Louis, Mo.

MANUFACTURER'S AGENTS

Wanted in leading cities for High Grade Products, nationally known and advertised. Sales last season over quarter million. State lines handled and territory.

BOX 21

Radio Digest, 123 W. Madison St., Chicago

1500 Miles On One Tube Set

1500 Miles On One Tube Set
Complete parts for Regenerative Receiver. We hear
Havana, Coha, regularly on this receiver. It consists
of the following standard parts: 1 180° variocompler.
1.28-palas variable condenser. 1 thoward socket, 17.
28-palas variable condenser. 1 thoward socket, 17.
28-palas variable condenser. 1 thoward socket, 18.
28-palas variable for panel, bus wire, tube SolderMalled Postpaid for
Malled Postpaid for
Miscellaneous
9.00 Unnihighem 801A Tube (½ amp.). 5.75
8.00 Unnihighem 801A Tube (½ amp.). 5.75
8.00 Unnihighem 801A Tube (½ amp.). 5.75
8.00 Unnihighem 801A Tube (½ amp.). 5.76
8.00 Unnihig

RADIO SUPPLY STORES

FLEWELLING ANSWERS

By E. T. Flewelling

(Editor's Note.—This department is written by Mr. Flewelling, the inventor of the famous super circuit. From the questions sent him each week care of Radio Digest, he picks the one considered most informative for all and answers it in this column.)

Variable Condenser Too Large

Variable Condenser Too Large (Submitted by T. Z., Jersey City, N. J.)
Question.—My Flewelling set is very selective and pretty loud, but I do not get the steady high pitched whistle when I have tuned in a station because I have to turn down the filament to reduce the whistle in order to bring in the station. Would the 43-plate variable condenser that I am using have any effect on the?

Answer.—Using a 43-plate condenser usually means utter failure with the Flewelling set, because the set tunes so sharply that one is unable to handle such a large sized condenser. Note also that the value given for the coils Note also that the value given for the coils is such that maximum results are secured by the use of the smaller condensers such as a 7 to 11-plate. If only the values that have been given in the various articles are used, you will find that the rheostat is only useful to turn the finament off or on, and does not in any way aid in tuning. Change your condenser to a smaller one, turn your tube on full, and you will see that the whistle will stay even after the estion is trued in after the station is tuned in.

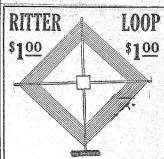
Directional Characteristics

Directional Characteristics
When an inverted L-type antenna is used at a transmitting station and it is desired to radiate the greatest amount of energy in the direction of a particular station, the end at which the lead-in is connected is pointed in the direction of the station with which it is desired to communicate. The reason for this arrangement is that electromagnetic waves radiate more strongly from this end, thus providing directional characteristics which may be used to advantage.

Get a License First

Get a License First

In order to operate a transmitting station, two licenses must be obtained—an operators' license and a station license. The operator must be able to transmit and receive at least ten words a minute, each word consisting of five letters or characters. He must also comply with certain regulations detailed in the pamphlet issued by the United States Government entitled "Radio Communication Laws of the United States."



We are originators of the knock-down pertable loop aerial. Packed in individual cartons. CONTEMTS —Green sitk covered wire, wood parts, binding posts and complete instructions on how to assemble and operate. By mail loe extra.

Ritter Radio Corp. 230 Canal Street

Summer Static Overcome



ANTENELLA

No aerial or antenna needed.
Eliminates aerial, outside viring, lightning arresters and other inconveniences inductive to static. Plug Antenella in any lighting socket and you can enjoy Radio in any room in your house. No current consumed.

New Improved Antenella NOW \$1.25 ONLY formerly \$2.00

At your dealer's—otherwise send purchase price and you will be supplied postpaid.

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Radio Digest

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

Vol. V Chicago, Saturday, June 23, 1923





OUR vacation, wherever spent, offers a host of Radio possibilities. The man in the cool, northern wilderness, the



in the cool, northern wilderness, the person sojourning at any one of the small lake resorts, the individual who prefers to rest in the country; in fact, all are realizing the full service which their small receiving set can furnish. News, baseball scores, market reports, music, invisible drama, and the multitude of innovations already made possible by the thoughtfulness of studio directors, are all there for the tuning. With fifty super stations keeping the various sections of the country well supplied with broadcast service, it is indeed a poor set that cannot tune in several plants. Again, a set which can reach only one hundred miles out from a city home, is almost sure to do much betternan that when installed in a small country town, out on a farm, at seaside, or in the mountains. on a farm, at seaside, or in the mountains.



UTOMOBILE tours have had a great revival in interest since it has been demonstrated that one can keep in demonstrated that one can keep in touch with the world by Radio, even while speeding along. The popularity of the passenger car has hardly had a slump, but the fact remains that the receiving of broadcasting stations en tour has added a new thrill to the jaded similarity of swallowing the unlaid dust of the car just ahead. An aerial around the top of the car, a loop, or even a hastily erected single wire to some nearby tree, plus a compact portable set equipped with dryell tubes, make an un-



able set equipped with dry cell tubes, make an unbeatable combination to fill in the leisure moments when the tourist has just about had his fill of holding the car on the road and wishes to rest. Then, too, the storage battery equipment of the average machine makes it very simple to use one's regular set with the larger tubes.



AMPING out is a time-honored sport.

From the time of the tribes of Israel, and thousands of years before that, the tent has been a shelter accepted by all. Thus we find many lovers of the great outdoors breaking away from the daily routine and making their home in a camp under the canvas spread of a tent where they can hear the bombardment of the rain pitter-patter and the call of the night birds. But add the marvel of the twentieth century to the scene. Easily erected, operate d amper's portable set provides that contact and cheer of the busy world, but in the isolation of the wilderness. The tenderfoot may find a m ping boresome at him the cartestainment and



The tenderroot may find camping boresome at times, but Radio will give him the entertainment and news, the lack of which is troubling him. Certainly, your vacation will be with Radio. Why not?



RADIO INDI-GEST

FIRST WALLA WALLA

(Continued from where we were interrupted last week.)
for this suspicious occasion, chief head official announcer not
article C.—Bambdin Bray, chief head official announcer not
the continuence he will not announce any more until
there's something more to announce. At present there is
nothing to announce except that he will announce. (P. E.
Bambdin Bray, chief head official announcer, uses deaf
and dumb sign language in all his announcing when he
announces.)



lr. Wattle Knees, musical director, walking south

Article D.—(Four and one-third cou-pons and a plugged litney.) The first act to be broadcast. Le Mo-queur and Ellis Broadlewse will terpsichore a synthelic dance before the microphone, Clisten in for this, It's gound be good.)

Article E.—Community Chorus, All listeners in will sing to the direction of Mr. Wattle Knees, Indigest's ultraordinary musical director. Wattle Knees will direct before the microphone with a muffeed before the microphone with a muffeed before destroy the great vast multitude of noises of our listeners in.

walking south

Article F.—Soft shoes dance by Polly
army shoes have been ordered from
the U. S. Steal Corp. for this momentous moment.

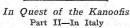
mentous moment.

Article G.—Motion Picture, "Why
Wallow in Walla Walla?" Scenario by Alogonquin Tonsils III;
Filmed by Spider, Webb; Misdirected by Lillian G.

Article H.—A trip through the Walla
Walla Museum. A portable microphone will be carried throughout
the entire length of this venerable
hall so that all exhibits may be
leasted.

neard.

Article I.—Collection taking for \$\$800,000,000,000,001 to help pay off the transfer of the transfer of



In Quest of the Kanoofis

Part II—In Italy

For days they searched the forests, no Kanoofis could be found.

(Misery, don't pester me.)

They hunted high and low for it, all over the ground. (Simply no luck.)

"It can't be here," said one of them, "Let's pack our things and go." (Merrily we roll along.)

"Where to? Ah, that's (Wise guy.)

"Where to? Ah, that's (Wise guy.)

"And the hot Tomale bushes are blooming in a row. (Pretty flowers)

"And the hot Tomale bushes are blooming in a row. (Pretty flowers)

"Where senoritas smock and dance and drink Italian wine."

(Burn my clothes.)

They journied to a little town. GARLICO was its name.

(Hamburger.)

An old Italian strongful the flowers (Hamburger.)

And here they met Marcroni, a duke of great renown, (Very episetc.)

Who told them that he knew where a Kanoofis could be found.

(Smart feller.)

He said there was an island in the olean far away. (And she volded in the siley.)

To look for it with all our might, and wed find it hye and bye. To look for it with all our might, and wed find it hye and bye. We told him that he wand, and we for it with all our might, and wed find it hye and bye. We told him that he wand, (Mot he.)

And mentioned he had helped us out in general, much too much.

(Big hearted.)

Then we left GARLICO, bound for Egypt, valley of the kings.

(Cheer up, only two more parts.)

(Cheer up, only two more parts.) Mike Rofarad Sez It's a Tight Squeeze

Park Rr. Gest: I have frequently heard mention of real, dyed-in-the-wool Radiokuuts, and some of them are interesting specimens, but have you heard anything to beat this? I have a girl friend who is such a confirmed Radiokuut that she refers to her Gossard as her "Variable coudenser"! Your disrespectfully,

A-B-C Lessons for Indigest Beginners Chapter I—The Antenna Does Which?

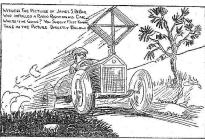
IS for antenna
Put up to bring in sound,
Sometimes it brings in lightning.
Through your set, down to the ground.

Indigest Plant Mustava Call!

Asleep here is Tom McAlaster Geyre. He put up an antenna And tried to walk wire.

Looking Ahead

In Next Week's Issue of Indigest Anticipate Nothing





Condensed

By DIELECTRIC

The owners of Station CFCN have launched into the business of manufacturing broadcasting sets and have already sold sets for use in Canada, Mexico and South America. Their programs are heard at considerable distances from Calgary and the W. W. Grant Radio, Ltd., is pretty well known in all parts of this country. Soon these Radiophone broadcasters will be talking back to the maker in Spanish.

When President Harding starts out on his trip across country he will have at hand a very powerful set installed in his private car. This is the first time that a broadcasting set of such power has been used on a railway train. It will also mark an epoch in the speechmaking of a head of this nation. Never before has it been possible for the rest of us to hear presidential addresses when hundreds of miles away, but now we may follow him as he speeds across the land stopping to speak at various towns enroute. Radio does it!

Radio control of the movements of ships has been tried with success on more than one occasion; a notable instance of this was the sinking of the Battleship Iowa off Panama Bay. There was no one on board as the ship was directed to the right or left in giving practice to the American gunners in hitting vessels under steam. More recently the French have tested the use of Radio in directing an airplane under similar conditions—pilotless. From the take-off to landing each move of the plane was actuated by Radio-control devices. It may be found practicable to substitute this medium in many lines now dependent solely on the presence of men.

Mississippi has resisted the impulse to join her sister states in the modern method of addressing the world until now. The first station to be licensed is the University of Mississippi, which has decided on programs of college songs and orchestra music. No doubt the alumni of this institution will be pleased to hear from their alma mater, but I am expecting to learn of educational features in the fall that will appeal to hundreds besides.

Not long ago Station WOR had rather an unique Not long ago Station WOR had rather an unique feature on its program when Bebe Daniels was interviewed by David A. Balch, editor of Movie Weekly. Miss Daniels was warned that not only Radiophans all over this country would hear her replies to his questions, but that the young lady with pad and pencil in the studio would take down every word to be given later to the readers of his paper. Judging from her answers she had prepared herself for the ordeal and made some pretty good "shots" in reply.

We are coming more and more to realize how very necessary Radio is to obtain a large hearing on any subject at any one time. In a case of distress, such as that recently in Colorado, Texas, an appeal may be made to folks in every state in the Union from a broadcasting station and quickly benefit thereby. A cyclone having struck this Texas town leaving much suffering in its wake, WBAP was asked to broadcast an appeal for funds. They poured in.

Preaching in churches with empty pulpits is becoming a thing of usual occurrence. Folks sit in their regular pews, sing, join in prayer and listen to sermons with no preacher anywhere in sight. When a church in Birmingham, Ala., found themselves without a preacher for the evening service they just made use of the pastor of another church in the city whose message was being broadcast. Another small church in New Jersey used a loudspeaker to fill their pulpit at short notice and it did well for the entire service of a church in New York city was brought to the congregation.

First Steps for Beginners in Radio

Chapter VI—About Crystal Detectors

By Thomas W. Benson, A. M. I. R. E.

OR several years in the earlier stages of Radio and before the development of broadcasting stations most Radio reception was accomplished with crystal detectors. Although they are scoffed at today for long range work very remarkable records were hung up in other days. Perhaps this was due to the fact that one had to use a crystal and for that reason coaxed the most out of it. Even today it stands superior to the tube for clearness and freedom from noise as one can testify after listening to a reflex set using a crystal

Crystal Detector Action

Just how the crystal detector functions is still a matter for debate but the prevailing theory is that of rectification. The currents induced in the receiving apparatus, are, as we have learned previously, the potential of the condenser will vary of extremely high frequency. At 400 me-

PEGINNERS will find the accompanying series by Mr. Benson very helpful in learning the rudiments of the popular science of Radiophony. The articles yet to appear are:

INCOMING MODULATED CURRENT

CURRENT AFTER RECTIFICATION BY DETECTOR

VARIATION IN VOLTAGE OF CONDENSER ACROSS PHONES

Figure 27-Showing Action of Detector in Radio Receiving Circuit

Chapter VII—Tube Detector Theory and Operation.

Chapter VII—The Regenerative Detector.

Chapter VII—Reflex Circuit Operation.

Chapter IX—Radio Frequency Am- Chapter XIII—About Headsets and Loud Speakers. Frequency Am- Chapter XIV-Batteries Used in Ra-

color and fractures very unevenly when split. For Radio work a good piece of galena

split.

For Radio work a good piece of galena is superior to fron pyrites but a good piece is rare and to be treasured. Galena is very sensitive to heat and its detecting properties are oftimes completely destroyed by the heating incurred during its mounting in metal. For that reason the crystal should be obtained loose and held in the cup with a set screw in preference to being set in molten metal.

The type of stand used with galena should be fitted with a fine cat whisker so the contact will be light. And therein lies the disadvantage of this crystal, for to obtain great sensitiveness an extremely light contact is necessary. This is easily jarred out by slight, vibrations. A short silver wine makes a very good cat whisker. A form of detector stand easy to construct and particularly suited to galena is shown in Figure 28. It can be made easily by anyone, the standard being a double binding post with a short brass rod through the top hole having a knob

SILVER PLATE WITH SHARP POINT MOUNTED CRYSTAL GLASS TUBE

Figure 29-Details of Detector Stand to Obtain Permanent Adjustments with Iron Pyrites

fitted to one end and a stiff wire wrapped around the other end. A small spiral of about No. 30 sliver wire soldered to the stiff wire serves as a contact for the crys-tal. The crystal itself is mounted in a rather thick brass washer and wedged

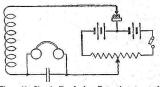
into place with tinfoil. A brass plate on the base makes contact to the crystal holder and permits the crystal being moved until the most sensitive spot is

moved until the most sensitive spot is found.

Experiments have been tried using various substances other than metal wires for contacts. Graphite is said to be superior to either silver or gold cat whiskers. The lead from a hard lead pencil sharpened at one end and attached with a small spring to the arms of the detector stand, shown in Figure 28, makes what is classed the best form of galena detector both as regards sensitiveness and freedom from burning out from static.

Tron Pyrites Detector

Let us now consider the iron pyrites. This crystal is shown preference by the Radiophans chiefly because it gives good results without much care in adjusting. It permits of more pressure being put on



Figue 30—Circuit Employing Potentiometer and Local Battery to Pass Current through Crystal Detector

Crystal Detector

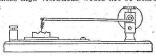
the cat whisker and hence is not so liable to be jarred out of adjustment. Not being so sensitive to heat it can be mounted in metal without difficulty.

It is not necessary that the stand used with iron pyrites have very delicate contact so any stand on the market can be used with success. However, the form of detector stand, shown in Figure 29, possesses several features to make it worthy of construction by those desiring the most from their crystal sets. With some changes several of the detector stands on the market can be adapted to this principle. It consists simply of a glass or other insulating tube mounted between two brass standards. A crystal of iron pyrites is put in one end as snown that a time the contact member is made from silver. A dime may be soldered to a thick brass disk for the purpose and its face cut into fine ridges with a sharp, three-cornered file, making cuts at right angles. The face of the dime is then covered with many fine points.

The contact plate is slipped in against the mica and a screw threaded into the other brass post used to force it against the crystal. With the detector connected (Continued on page 14)

(Continued on page 14)

ters the current has a frequency of 750,000 cycles. If this current was made to act on the diaphragm of a telephone receiver it would vibrate back and forth that many times per second. The human ear, however, cannot respond to frequencies above-ever, cannot respond to frequencies above-striking the microphone at the sending station. **Materials for the Detector** Many substances have been used for de **Many substances have been used for de **Many substances have been used for de-



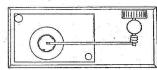


Figure 28-Details of Detector Stand Designed

A crystal detector connected into the circuit acts to rectify the current, that is, allows the current to flow in only one direction and retards or prevents it from flowing the other half of the cycle. This may be better understood from Figure 27. At A we have the current induced in the detector circuit showing the modulation of the waves by the microphone at the transmitter. At B is shown the same current after being rectified, that is, with the lower halves of the cycles cut off. The current is now direct but is pulsating, that is, flows in jerks. The ef-

Materials for the Detector
Many substances have been used for detecting purposes with more or less success and each day sees the birth of some new substance or an old one in a new dress. The two most popular minerals that have been found the most sensitive are galena and iron pyrites. Galena is a natural sulphide of lead, its crystals being cubical in form, having a bright metallic lustre and can be readily split up into regular cubes. Iron pyrites is also a natural ore known sometimes as "Fool's Gold" from its yellowish sheen. It is of a bronze-yellow



0 1 (e) Delicate Soldering Both the manufacturers' and amateurs' problems on all fine work are readily solved by the instrument constructed for this particular purpose. THE POST SOLDERING IRON Platinum Heating Unit-Interchangeable Tips-Universal Current (Large and Small) ONE-HALF ACTUAL SIZE Awarded Certificate of Excellency, N. Y. Evening Mail Radio Institute

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FLEWELLING CIRCUIT
Every part complete, including drilled panel and hook of diagrams and instructions \$11.95 \$11.95

REINARTZ CIRCUIT\$10.95

Two-stage Audio-Frequency Amplifier. Every part complete for above circuits at

CONDENSERS

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Honeycomb Coils, 50 turns mounted	.95
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Double Coil Mountings	2.45
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Jacks, Single Circuit; value, 65c, special at	.30
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Two-inch Dials, same design, for rheostats and	.25
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highly polished; \$8.00 list	3.75
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With 2" Dial, 15c extra.	

A beautiful "SALRITE" pencil FREE with every order of \$12.50 or more. Made of beautiful Mahoganite Rubber-five inches long. Equipped with vest-pocket clip, 10 leads and eraser.

Now is the time to build your own set to take with you on your vacation. We will be glad to offer you any information or advice that you may require. Just drop us a line.

A Recommendation

Hartford, Conn., June 4th, 1923.

Willard Radio Co. New York City.
Dear Sirs.—
I received the Flewelling Circuit complete and wish to thank you. It is a beauty. I set it up in one hour and a half, but I have to get batteries so I wish to thank you again, also for the present that you sent me.
I have priced the machines here in Hartford in that they cost anywhere from \$35 to \$190.

I will close now but if I want anything in the future, you will have my order.

Again I wish to thank you.

I remain

Yours truly, CHAS. W. HIGLEY.

AUDIO FREQUENCY TRANSFORMER. Designed for use with W. D. II tubes; list, \$2.75 VARIOCOUPLER—Litz Wire Wound Scoondary; value, \$4.50; spread, \$2.25 Bail Bearing Inductance Switch; value, 75c; special 3.30 V. T. Sockets, nickeled, brass, sleeve, composi-tion base; value, \$1.00; special at.....

Every article advertised above is guaranteed by the manufacturer and by us. Mail orders filled immediately. Transportation PREPAID on all orders of \$5.00 or over, east of the Mississipni River. All others include postage.

Flewelling Circuit in Portable

Makes Ideal Apparatus to Use on Camping Trip

As will be seen by the halftones the entire portable Flewelling outfit is assembled in a cigar box which measures 9 inches long, 61/2 inches wide and 21/2

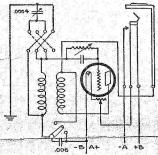
WORKSHOP KINKS? EARN A DOLLAR-

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

RADIO KINKS DEPARTMENT, Radio Digest
123 West Madison St., Chicago, Ill.

inches deep. This box was finished with a good coat of insulating varnish inside and outside. The varnish used was made by dissolving ordinary phonograph records in alcohol.

The colis are one 50 and one 75-turn, but I believe a 45-turn coil for the tuning inductance would be better, as the 360-meter stations don't come in very well



with the 50-turn coil. The condenser has .0004 mfd. capacity. The tube used was a VT-2. The set also is equipped with a variable leak and grid condenser. In the upper right corner is the automatic filament jack while a current adjuster controls the current flow to the filament.

I obtain the best results using only one connection, that is either using the ground or one side of the 110-volt line on the

This is the New with The Adjustable Air Gap That Tunes Out All Harshness

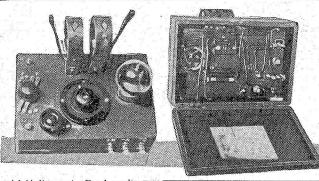
Invite your friends tonight. Sur-prise them with a REAL concert or

mierful new Dictogrand will the litusion that the artists the very room with you. Just our dealer's and hear this re-le, clear-toned instrument, home and plug in for the cutertainment you're ever You don't need extra bat-

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CIGAR BOX HOLDS FLIVVER SUPER



aerial binding post. Equal results were obtained by using a telephone ground.

The first time I tried the set I was dumfounded by hearing KFI Los Angeles, and with only the ground connection. It seemed incredible. I could hardly believe my ears, WMC, WEAF, WLAG, KSD, WOC, WOAW and several others also come in so loud as to be audible several feet from the phones. It truly is a wonder-box and it is nothing short of miraculous the way they come in.—Francis W. Lovgren, Virginia, Minn.

"A" Battery Condition

"A" Battery Condition
A storage battery of the lead-acid type
when fully charged and on open circuit
should have a potential of 2.2 volts per cell
and a specific gravity of 1.265 to 1.280.
When placed in service and used under
normal operating conditions a fully
charged battery has a potential of 2.0 volts
per cell and a specific gravity of 1.225.
When the potential of the battery has
fallen to 1.8 volts per cell with a specific
gravity of approximately 1.175 it should
be placed on charge. When a battery is
connected to the charging source, the positive terminal of the battery must be connected to the positive lead of the charging
power supply.

Grid Leak Resistance

In vacuum tube receiving sets employing grid condenser and leak, it is found in some cases that broadcast signals are received clearly when the set is placed in operation, but suddenly cease after a short interval. Disconnecting the plate

Booko

many others, simple and elaborate, fully diagrammed and explained. Used continuously by thousands of Radio fans, both amateurs and professionals. The greatest book ever published for experimenting. Keep this valuable little book before you at all times. Send your check or money-order for one dollar and the book will be mailed to you. Forty-seven hook-ups, all different. Send your order today. The edition is limited. tion is limited.

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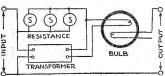
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battery and then reconnecting it causes the signals to be resumed for another period and then cease abruptly as before. This condition results from the use of a grid leak having too high a resistance, thus allowing the accumulated charges to choke the tube. Disconnecting the plate battery for a time permits the charge to leak off and allows the set to function for a short interval until the charge builds up and again chokes the tube. The remedy is to draw a few pencil lines across the grid condenser. These lines should make good electrical contact at each end with the terminal posts of the condenser, thus reducing the resistance of the grid leak.

HOME WORKSHOP CO., P.O. Box 1062,

Double Filament Globe Makes Battery Charger

Electrolytic rectifiers are usually used where small direct currents are required, such as for charging B batteries. However, this type of rectifier is troublesome and dirty and therefore not very desirable. A far more efficient instrument is shown in the illustration. It consists of a double filament automobile headlight bulb used for the rectifying unit and a step down transformer having the proper secondary voltage to light one filament is not lighted, but used in place of the plate common to bulbs made for this purpose.



A variable resistance consisting of a water rheostat or a lamp bank is placed in series with the bulb to bring the voltage down to the required pressure. When large currents are required it is advisable to connect three or four of these bulbs in parallel.—D. Y. Solandt, Toronto, Ont. variable resistance consisting

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BUILD YOUR OWN SET

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ACCORDING TO OUR INSTRUCTIONS EED—PANELS ON ALL SETS DRILLED-READY TO MOUNT RESULTS GUARANTEED

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Receiving Set \$17.95	Complete Parts for Reinartz Sets
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Complete Parts for 2 Step Am-pilifor \$12.45 Can be used to amplify Reinartz, Flewelling, Short Ware Receiver, Crystal. Ultra Audion or any Re-ceiving Set so that Loud Speaker or Phonorraph can be used in place of Head Set. Reg. Our Price Price Panel ...\$1.89 \$1.70 te Socket 1.00 .45 er 3.30 1.45 1.50 .75 ch Points .80 .40 Reinartz iable Grid Condenser 1.00 .75
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of Head Set.

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How to Make a Camper's Portable Reflex Set

Part I—Carrying Case and Built-in Loop

By H. J. Marx

Actual Froblem

Second, the question of aerials has been a big drawback. There are two ways of solving this problem. One is to use a wire aerial that can be temporarily rigged, and

and head receivers.

Need Two Panels

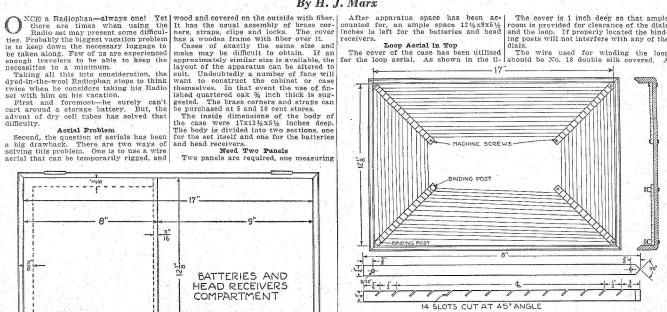
Two panels are required, one measuring

The cover is 1 inch deep so that ample room is provided for clearance of the dials and the loop. If properly located the binding posts will not interfere with any of the dials.

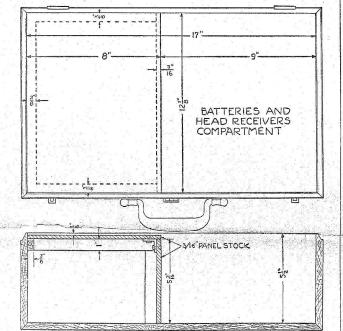
receivers.

Loop Aerial in Top

The cover of the case has been utilized for the loop aerial. As shown in the il- should be No. 18 double silk covered. A



lustration, four strips of fiber or panel stock 14x14x8 inches long are slotted to carry the wire. These are fastened at an angle of 45° in the four corners of the cover by means of machine screws and nuts. The one in the lower left side next to the apparatus compartment is fastened by means of the two machine screws running into the binding posts. The start and finish of the loop wire is in these two posts which are later connected to the set itself.



simplified.

Choice of Three Hook-Ups

In the set to be described everything except the loud speaker is carried in a fiber sample case the inside dimensions of which are 17x12 %x5½ inches. Three hook-ups will be placed at the option of reader. These are the two tube, three tube and four tube reflex circuits. These have all been tested and present another interesting little development in reflex design. The four tube circuit has already been assembled in the case to be described, so the fan need have no fears regarding the possibility of enclosing all the apparatus in the limited space available. If properly arranged there is a distinct advantage in compact layouts of reflex circuits; connecting lead lengths are reduced to a minimum.

Description of Fiber Case
The case itself is made up of %-inch

The trick is in

the Coil
NO STORAGE BATTERY
REQUIRED

No Radio Frequency Trans-ormor used. Not Super but OUBLE Reflex Regeneration, Vorks local without antenna or

Works local without antenna or ground, and brings in the 'FAR AWAY ONES' with more volume than you ever thought one tube could de-liver

thought one time could de-levely Order for 25 cts. brings easy to read diagrams and all information. Address: JACK PRATT 588 Railway Exchange Bldg., Chicago, Ill. 5P. S. Its Radio Golf Rec-ord is 110,000 miles. First Frial Picked Up Havana. from New York

the other is to use a loop aerial with a type of circuit that will build up the strength of signals sufficiently. Loop aerials always offer the additional attraction that they are less susceptible to interference than the usual straight wire aerial. With loops the value of reflex circuits becomes more apparent.

If everything can be self-contained in a small traveling case—then the question of luggage space has been considerably simplified.

Choice of Three Hook-Ups
In the set to be described everything TULIP



LOUD SPEAKER

The Horn Beautiful!
 24" Complete
 \$18.00

 28" Complete
 16.59

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Federal makes a complete line of Standard Radio apparatus—all rea-sonably priced. Write for latest catalog.

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sally endorsed by engineers and experts. Years of experience in making com-munication apparatus enabled Federal to enter the Radio field with Head Sets and other Radio apparatus unsurpassed

for efficiency in operation.

Permanent magnets, specially treated steel, and precision machining of metal parts are some of the outstanding features of construction that make Federal Standard Head Sets the best you can buy.

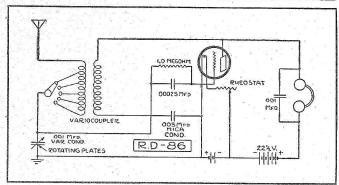
Ask your dealer for Federal Standard Head Sets. If out of stock he can get them from our nearest office.

Federal Telephone & Telegraph Company

Factory: BUFFALO, N. Y.

Western District Office: 417 South Dearborn St., Chicago, Ill.

SELECTIVITY IN PORTABLE R.D.-86



HERE is an unlimited field for good single tube portable set curcuits. Any regenerative type of circuit will give good volume on a single tube. The main problem is to use a type of tuning unit that will permit maximum selectivity. In hook-up R.D.-86 a variocoupler is used in conjunction with a variable condenser for the tuning unit—the rotor supplies the feed back of the plate circuit. The circuit is not primarily intended for loop aerial reception although one end can be connected to the antenna post, the other end left open, and a regular ground connection is used. When so connected, some very good results are possible. If a straight wire aerial is used, a length of 50 feet can be thrown over a convenient tree. Of course this will not give the best results. If time is available, the wire should be suspended between insulators.

A copper rod driven into moist ground contection. The rotor circuit so as to avoid short circuit. The grid leak can be of the variable to maker. The tube is a detect, although the wind will be such a case if may be addended by the suspended between insulators.

A copper rod driven into moist ground connection. The rotor circuit so as to avoid short circuit. The sprid leak can be of the variable to make the public through the plate circuit. The substituted. In such a case if may be addended to the connected to the arrange of the variable to increase the plate battery voltage. A cushion mounting for the tube sets of the preserve the tube filament. The recommended as a portable set get considerable knocking around that the proposition of the maker of the variable to increase the plate battery voltage. In the filament are proposition of the work of the variable to increase the plate battery voltage. In the filament are proposition of the proposition of the work of the variable to increase the plate battery voltage. In the filament are proposition of the proposition of the proposition of the variable that the proposition of the work of the variable to increase the plate battery voltage. In

tion. The crystal can be restored to its original sensitive state by washing with pure alcohol or ammonia, scrubbing the surface with an old tooth brush. Allow the crystal will be found as good as ever. When completely insensitive, simply cleaving the surface will be found as good as ever. When completely insensitive, simply cleaving the surface of the crystal with a knife or cutting pilers will usually uncover more sensitive spots and make the crystal still of value.

Using Battery With Crystal

There is sometimes a slight advantage in using a battery in connection with a crystal detector and for the benefit of those who care to experiment with this arrangement a method of connecting the battery and potentiometer is shown so slight currents may be impressed on the detector by adjusting the potentiometer. Two or four dry cells may be used with a 400-olm potentiometer, opening the battery did not be sent to the section of the content of the proper potential is applied to the detector.

The method of procedure is to first adjust the detector to maximum sensitiveness with the potentiometer at the center point and then by turning it one way or the other a slight current of the proper potential is applied to the detector.

Maximum signal strength can only be obtained when the condenser used across the phones is of a good grade. Use a mica condenser, or better still, one with air as the dielectric. Receivers will work without a condenser but it will be found the phone cords form a small condenser and thus permit reception.

There is still a wide field open for experimenting on crystal detectors or some similar rectifying device. A peculiar fact about any pair of contacts that will rectify high frequency currents, such as galena and silver, iron pyrites and brass, sillcon and brass and so on through the list of crystals, is that one of them muits negative electrons under the influence of light, the other does not. Whether this has any bearing on the phenomena of rectification is still an open question, the solution of The problem of tuning your set to best advantage will have to be worked out for yourself, as each set is a little different.

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EDISON Elements for making "B" Batteries,
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Radio Experimenter's Handbook, By M. B. Sleeper. This book will help in the selection and the construction of simple apparatus for transmission and reception of Radio telegraph and telephone signals. Prics, \$1.00.

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The Radio Amateur's Handbook, By A. Frederick Collins. A new revised edition of this book is just out. It is complete, authentic and informative work on Radio. Fully illustrated. Price, \$1.50.

Experimental Wireless Stations. By P. E. Edelman. Simple directions are given in this book for making Radio equipment for the transmission of messages over long distances. Price, \$3.

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Amateur Radio Call Book, Fourth edi-

Amateur Radio Call Book, Fourth edition just out. A complete list of amateurs, special amateurs, technical and training stations of the United States and Canada. How to construct and operate a Reinartz tuner, detector and one step amplifier. Large two color map included. Price \$1.00.

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FIRST STEPS IN RADIO

(Continued from page 11) into the circuit the screw is run in slowly forcing the points on the silver plate through the mica and making contact with the iron pyrites. When the loudest signals are heard the detector is left adjusted and will continue to function indefinitely. This is as near perfect a fixed detector as it is possible to construct.

it is possible to construct.

A white mann, non pyrites used in a stand with a pointed piece of antimony fitted to the cat whisker for a contact, sylves excellent results and is an arrangement recommended to users of the adjustable type of detector stand.

There are numerous other crystals advertised at present, the greater number of which are compounds of lead or silver and sulphur.

Synthetic Crystals; Clipping Contact.

Synthetic Grystals; Glipping Contact.
One method of making these synthetic crystals is to bury two dimes in flowers of sulphur for a week or so. On removing one of the dimes it will be found covered with black silver sulphide and will function as a detector crystal. After using for a week the second dime can be brought into service and the first replaced in, the sulphur for renewal. Thus the two are used alternately and will last indefinitely. This is worth trying.
When a metallic wire is used as a con-

When a metallic wire is used as a contact on the crystal it oxidizes rapidly and poor reception is often blamed on the

crystal when it is the fault of the cat whisker. The obvious cure is to clip the end of the cat whisker when the signal strength falls off so a clean, fresh surface of the metal is presented to the crystal. An enclosed form of detector is advisable when the apparatus is subject to dust or moisture and not only reduces the oxidizing of the cat whisker, but protects the crystal as well.

Restoring Sensitiveness of Crystal.

Handling a crystal has been said to destroy its sensitiveness when as a matter of fact the sensitive points have been covered with a fine film of oil from the fingers and will not function in that condi-

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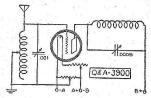
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<u> Michigan Radio (orporation</u>

Duestions and Answers

Radio Frequency Amplifier

Radio Frequency Amplifier
(3900) HRH, Ft. Leavenworth, Kas.
I have been a reader of your paper for some time and have patiently waited for a Radio frequency hook-up to work on my tube CR No. 9, but so far I have not seen it. Hence this letter.
Could you send me a hook-up of 2 stages that would work on my set, preferably where it will not be necessary to change the set I now have, in fact, one



which would work like the one for the Flewelling you published May 12, 1928, page 13? Would like to have the diagram plainly marked as to capacity of different parts, etc.

A.—Complying with your request we are illustrating on this page a diagram showing method of adding one stage of Radio frequency amplification to Grebe CR No. 9. No changes in present circuit will be required. If desired additional stages of Radio frequency may be added in the usual cascade manner.

Output coil is placed in inductive relation to the tuner on the set. This output coil can be of the honeycomb type 25 to 75 turns, depending on the wave length desired.

Best Broadcast Receiver

Best Broadcast Receiver
(2863) ARL, Reading, Pa.

I wish to thank your Q. and A. department for previous questions answered. They may be interested in knowing that I have found the cause of my A.F. amplifier trouble to lie in the UV-201 tubes. It appears as though the plate current leaks through the tubes, the quantity depending on the degree to which the filaments are lighted. In one case, through the range of off to full brilliancy, the plate voltage dropped from 196 to 170.

What do you consider the best broadcast receiver from the standpoint of selectivity machily but with as much volume as pose-

The two circuits you seem to be specializing on at present are the Reinartz and Flewelling, and I have read or heard that the Reinartz is not well adapted to phone. In answering this question, however, do not confine your consideration to those two only only.

I presume the super-heterodyne is super

THE B-T Reinartz-Vernier TUNING UNIT

Replaces tapped coils, eliminates soldering and gives greatly improved results.

Write for Circular and Diagram

BREMER-TULLY MFG. CO. 532 S. Canal St.

ior but there is some doubt in my mind as to whether the large amount of apparatus and tubes required warrants their use. What is your opinion of a capacatively coupled tuner? I have recently finished calculations for one in which I figure I can obtain a 4-meter variation in the 3008-00004 mfd. range of UC-1820 condenser, but have not started making same and have no idea what volume to expect. Is it possible to use the Flewelling circuit for longer wave lengths and if so, what coils should be used?

A.—We are gratified to note that you have located difficulty which was disturbing the effectiveness of your circuit. It is our opinion that the Armstrong three-circuit regenerative receiver is the most consistent and practical, aside from experimental interest. This circuit is hardly comparable with the super-heterodyne, which, however, is more intricate and difficult of operation by less than an expert.

Noting your reference to the Reinartz

and difficult or operation of expert.

Noting your reference to the Reinartz circuit, advise that it is as well adapted to phone as any other set.

We would not advise a capacitively coupled tuner as being selective.

The Flewelling circuit is not adapted for wave lengths over 800 meters.

for wave lengths over 800 meters.

Variocoupler Winding
(2608) RLT, Columbus, Ohio.

Would you kindly give me information
on how to construct a variocoupler for
the Flewelling circuit?

I have been following each and every
one of his articles and note that he says
for everyone to stick to the parts that he
uses or the builder might be disappointed.
He spoke of a variocoupler with 75 turns
for a rotor and 50 for the stator.

As I travel for a construction company
I would like to have this set portable, so
I can carry it about with me, but with
honeycomb coils the set is bulky to assemble for carrying.

Would like to have the size of tube and
rotor, numbers of turns of wire, also size
and kind of wire. I also ask you if the
Variadon condenser manufactured by Dubilier Condensers and Radio Corp. is vernier enough in adjustments sufficient to
use with this circuit instead of using the
plate condenser?

A.—Answering your inquiry with reference to the variocoupler; use fifty-six
turns of number twenty-two wire tapped
every seventh turn for the primary and
seventy-five turns of number thirty wire
for the secondary. Wind our a scandard

seventy-five turns of number thirty for the secondary. Wind on a sta size rotor and stator. Connect in Flewel-ling circuit in the same manner as the



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honeycomb coils, primary as tuning inductances and secondary as tickler.

In our opinion, honeycomb coils would be much less bulky and will certainly be more efficient. Would advise adherence to specifications as nearly as possible.

The condenser suggested should serve effectively.

Ground Wum (2888) JFT, St. Louis, Mo.

(2888) JFT, St. Louis, Mo.

I made a socket serial as per instructions in your magazine of February 24. I
think it's just great, outside of one fault
that I found with it, which is a loud buzzing sound that is so strong as to prevent
me from hearing some of the local broadcasting. I have a crystal set and would
appreciate very much if you will kindly
inform me as to how I can overcome this
annoyance?

A.—The annoyance of hum occasioned
can often be overcome by grounding the
minus side of the A battery in a tube set,
but do not believe that there is any way
of eliminating it with a crystal set.

Reinartz Circuit

Reinartz Circuit

(2474) JNS, Jacksonville, Fla.

Kindly advise me concerning the Reinartz circuit, on the following points:
What covering should the wire have, S. C.,
D. C., silk, enamel or cotton and enamel?
It being difficult to obtain fibre board
for winding the spider web coils on, what
can be substituted instead?
What kind of insulating enamel gives
the best results on these coils, or others?
A.—Use DCC wire. Cardboard, very
thin wood, old phonograph records may
be used for spiderweb coil winding.
We would not advise the use of enamel.
Coils may be coated with a very thin
shellac to guard against moisture.

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Calcutta on a Loop

Calcutta on a Loop

(2579) GBV, Quincy, III.

A friend of mine states that twice last week he got Calcutta, India on a loop set, using three stages of Radio frequency and two stages of audio frequency, hearing voice and music.

The writer is not exactly familiar with what distances these signals may be picked up so I am not sure whether he is kidding me or kidding himself. I really believe an article in your excellent paper, of which the writer is a subscriber, covering this subject, including the possibilities with present day apparatus of hearing voice and music at great distances would be of interest as there are a great many readers who would appreciate enlightenment on this subject.

A.—We are reluctant to dispute the word of your friend in stating that he has been in Radio communication with Calcutta, India, but a high regard for facts as they are bids us to assure you that he is spoofing you or kidding himself.

Radio communication beyond the range of the United States and Canada is not as yet achieved except under experimental tests under all favorable conditions of operation and equipment as recently accomplished in the Trans-Atlantic tests in which stations in England were received by a limited number of operators.



110)10



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