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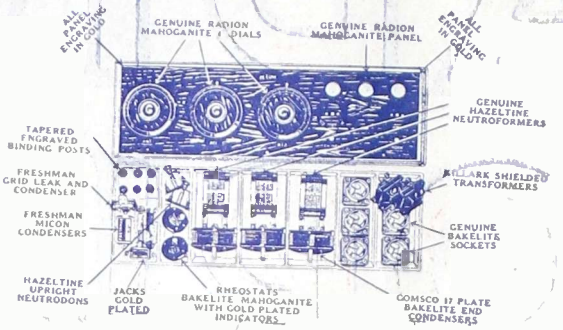

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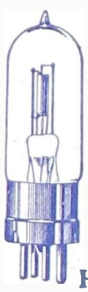

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VOLUME FIVE OF

RADIO WORLD

[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879]

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Vol. V, No. 5. Whole No. 109 **April 26, 1924** **15c. per copy, $6.00 a year**

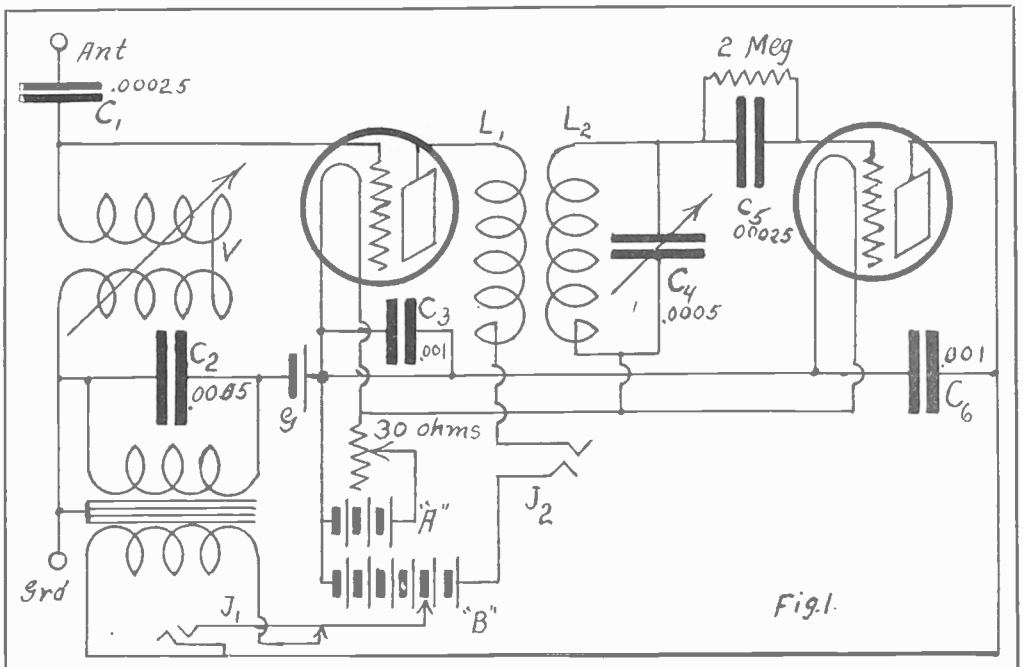
A Set for Campers:

A LIGHT, COMPACT PRODUCT DESCRIBED

By J. E. Anderson, M. A.

THE requirements of a receiving set suitable for a camping outfit are portability, ruggedness, simplicity and sensitivity. The set described in this article meets these conditions. It is a two-tube reflex circuit, employing UV199 tubes both as amplifier and detector, and it is therefore equivalent to a three-tube circuit having one stage of RF amplification, a detector and one stage of audio frequency amplification.

The antenna or input circuit of the tube is of the single circuit type, having a short wave condenser in series to cut down the natural wave length of the tuner, and a variometer for tuning. If the antenna is very small the condenser C1 (Fig. 1) is not necessary. The antenna should be constructed of about 150 feet of flexible copper wire and mounted between a couple of trees. It is more convenient in most cases to erect a good antenna in a camp than in a city.



THIS COMPACT TWO-TUBE PORTABLE SET can be built into a small suitcsae, and space arranged for the dry cell A and B batteries. If the builder is ingenious, he can arrange the jacks to come out at the side, so that after a station is tuned in, the suitcase may be closed, and the phones or loudspeaker plugged in on the outside. The antenna, if made of flexible insulated wire, can be coiled up and stowed away when not in use. Some bare wire, dropped into a river, lake or even a well will make a handy ground.

The ground may be constructed by throwing the ground wire (bare) into a stream of water or burying it in moist earth. If this is not convenient, a good counterpoise ground may be constructed by stringing a second wire directly under the antenna about 5 feet above the ground and insulated from it. Either of these grounds will be more satisfactory than a loop, which is ordinarily employed with portable sets.

The variometer used in the set may be of the basket-ball type of instrument. This is very light and for that reason suitable. Although it is not in itself as rugged as many other types of variometers, its lightness makes for greater overall ruggedness of the set. This is not a contradiction of terms. The primary inductance (L_1) of the interstage coupling transformer should consist of 15 turns of No. 24 double cotton covered wire wound on a tube 3" in diameter. The secondary inductance (L_2) of this transformer should be wound with 48 turns of the same size wire and on the same tube. The two windings should be put on in the same direction and they should be separated by about ¼". The terminals which are physically adjacent should be connected to the batteries and the other terminals to the plate and grid.

C_2 is a by-pass condenser across the secondary of the audio frequency transformer. It should be a .0005 fixed mica condenser of the Dubilier type. C_3 is a by-pass condenser across the telephones and it should be a .001 mfd. fixed mica condenser of the same type. C_4 is the secondary tuning condenser in the coupling transformer. It should be a 23 plate variable condenser. C_5 is the grid blocking condenser in the grid circuit of the detector tube. It should be a good mica condenser having a capacity of .00025 mfd. or somewhat less. C_6 is a by-pass condenser across the primary of the audio frequency transformer and may have a value of .001 mfd.

The grid leak for the detector should be two meg-ohms or more. This value is not at all critical. The filament rheostat, which serves for tubes, should have a resistance of 30 ohms.

The audio frequency transformer is a very impor-

(*Concluded on next page*)

Announcer's Job Not so Soft, After All

(Westinghouse)

AS she imagines the announcer.

RADIO, the newest industry and science, now claims the labor of 250,000 people and the leisure and rest of countless more. In the broadcasting branch of the science a new vocation has developed, that of the radio announcer.

To be a successful announcer something more than a pleasing voice and clear enunciation are required. The ideal announcer is a musician with a knowledge of composers and their work; he should be a linguist familiar with French, Italian and German; he should be able in an emergency to make an announcement in English without confusion and free from grammatical errors.

He must be tactful in receiving artists and instructing them in proper position before the microphone. Singers and speakers accustomed to public appearance very often develop microphone fright, not because the studio surroundings are overpowering, but because they miss the stimulating presence of an audience; it is difficult to visualize the vast radio audience, headphones on head or grouped about loud speakers.

The announcer's duties are not limited to his appearance before the microphone. They conduct rehearsals of applicants. By means of the try-out, poor singers are saved the embarrassment of failure before the microphone. The rehearsal also serves to demonstrate that certain voices have not the quality for radio transmission. Sometimes the finished and successful singer is found to have a voice unsuited for radio transmission and on the other hand singers whose voice is too weak for public hall or theatre, sometimes possess quality and tone which win instantaneous popularity with the radio audience.

Announcers are often vocal soloists and may, in the event of an emergency, such as the failure of scheduled artists to arrive, step before the microphone and give a creditable performance.

A Set for Campers

(*Concluded from preceding page*)

tant part of the circuit. Where possible, one of the highest primary impedence should be employed which has a transformation ratio not greater than 5 to 1. Where extreme lightness and small space must be considered, a transformer having a low-turn ratio might be used.

The filament current should be obtained from two dry batteries connected in parallel. Only one of these may be employed where extreme compactness is desired, but then a spare battery or two should be available in case the first becomes exhausted. The "B" battery should have a voltage of 45 volts and it should be provided with taps so that any voltage from 18 to 45 may be used on the detector. Forty volts should about right for the detector tube and the full voltage of the battery should be used on the amplifier tube. The "C" battery consists of a single dry cell of 1.5 volt. This may be one of the smaller dry cells used for miniature flashlights.

A double circuit jack J_1 is provided in the output of the detector so that the telephones may be plugged in there, and a single circuit closed type jack J_2 is provided in the output of the amplifier so that the amplified audio frequency current may be obtained there. This jack may be a double circuit jack in which the two middle springs have been short circuited.

Since UV199 tubes are to be used in this circuit it is recommended that cushions of sponge rubber be used under the sockets so that there will be no microphonic noises in the signal. There are several sockets on the market already provided with these cushions.

When this circuit has been connected up chances are that it might oscillate due to stray feed-back in the first tube. This may be stopped by the small neutralizing condenser N which is connected between the two grids. The simplest way of making this condenser is to take two pieces of well-insulated wire and connect one to each of the grids, and twisting the other two ends together without bringing them in metallic contact. To adjust this condenser to the proper value, twist or untwist the wires. In doing this, remove the first tube from the socket, wrap a piece of paper around one of the filament prongs, and then return the tube to the socket. It should not light when the filament battery is turned on. Then vary the condenser, until the circuit is neutralized.

The condenser may also be made in the same way as the neutralizing condensers in a standard neutrodyne circuit. The neutralization may be either carried out until it is complete or until it just stops the oscillations for the frequency at which the tendency to oscillate is greatest, usually the highest frequency to which the circuit tunes. By placing the variometer and the interstage transformer at right angles to each other, the magnetic feed-back is reduced, and this will stabilize the circuit.

The panel for this receiver may be something like that shown in Fig. 2. Here the variometer dial is on the left, the tuning condenser dial on the right, and the rheostat and jacks in the center. This gives a symmetrical layout. The size of the panel need not be larger than 6″x9″x3/16″, and the depth of the cabinet should be about 7″. Provide a compartment under this set for filament and plate batteries.

Only two binding posts are needed on the panel—one for the antenna and one for the ground. Terminal posts may be provided for the filament and plate batteries inside the cabinet so that replacements may be made conveniently. If external batteries are desired, three additional binding posts are required—one for the negative of the two batteries, one for the positive side of "A" and another for the positive side of "B". These may either be placed on the panel or on a subpanel at the rear of the set.

Distance on Crystal a Reality

By A. E. Herron

MANY amateurs have been reporting long distance stations with the ordinary crystal receiving sets. By many persons owning expensive sets this is treated as a joke, but it is no joke.

If you have the location, a very good aerial and a sensitive piece of galena crystal, distance is possible.

Galena crystal has been found more sensitive than any other mineral having rectifying properties and is claimed by many to be as sensitive as a valve rectifier, but not as reliable.

A galena detector requires a very light point, therefore it is necessary to use a very fine wire as the catwhisker, preferably of steel. A very good wire for this purpose is a violin string E.

Operators on the Atlantic ocean and the Great Lakes whose sets aboard ship are of the crystal type have often switched to the broadcasting wavelengths and listened in—themselves amazed to hear concerts thousands of miles away!

This distance has often been reached with a carborundum detector. This type of detector is not nearly as sensitive as galena, but is more reliable, because, once a sensitive spot is found it stays that way for weeks sometimes, without further adjustment.

Experiments were tried also with galena detectors. The distance reached was almost doubled. Of course, the range is attributed to the extremely favorable location with no obstructions of any kind to stop the incoming waves on their travel. These remarkable results are obtained only during the winter, on cold clear nights when "freaks" are at their height and there is no static.

Many novices in the cities with their small aerials have been able to hear distant stations on their crystal sets, but in most cases it is due to some local tube receiver re-radiating the received energy. As soon as the tube receiver is shut off, the distant station on the crystal set is no longer heard.

Nearly all crystal sets made for popular use are of the most simple type, easy to operate and fairly selective. Once a sensitive point on the crystal is found, the rest is simple. Almost every operator of a radio set knows that the farther the station, the more selective it seems to be. Therefore for tuning a continuously variable capacity or inductance is absolutely necessary for best results.

With the ordinary tapped tuning coil, when it is used without a variable condenser, fine tuning is impossible. Naturally, the more distant stations will nearly always be missed.

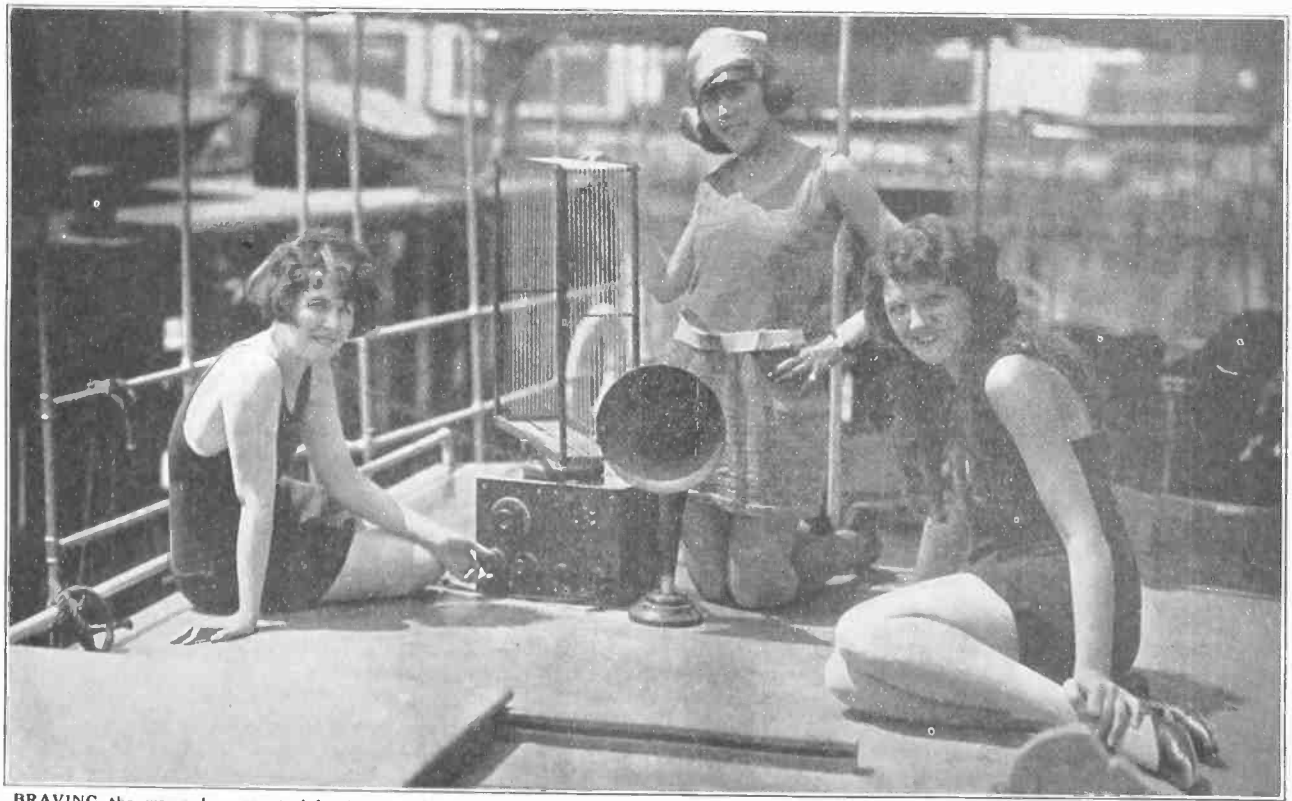
Many crystal set owners do not bother trying to get any distant stations, as they understand that a crystal set is made only for local reception.

No doubt if they were to try hard and tune the set carefully, they would get the surprise of their lives.

The writer has always been a great believer in using the crystal detector for rectification and for clear reproduction of music and the voice, and no doubt the crystal detector will be used for this purpose in the future perfect receiver.

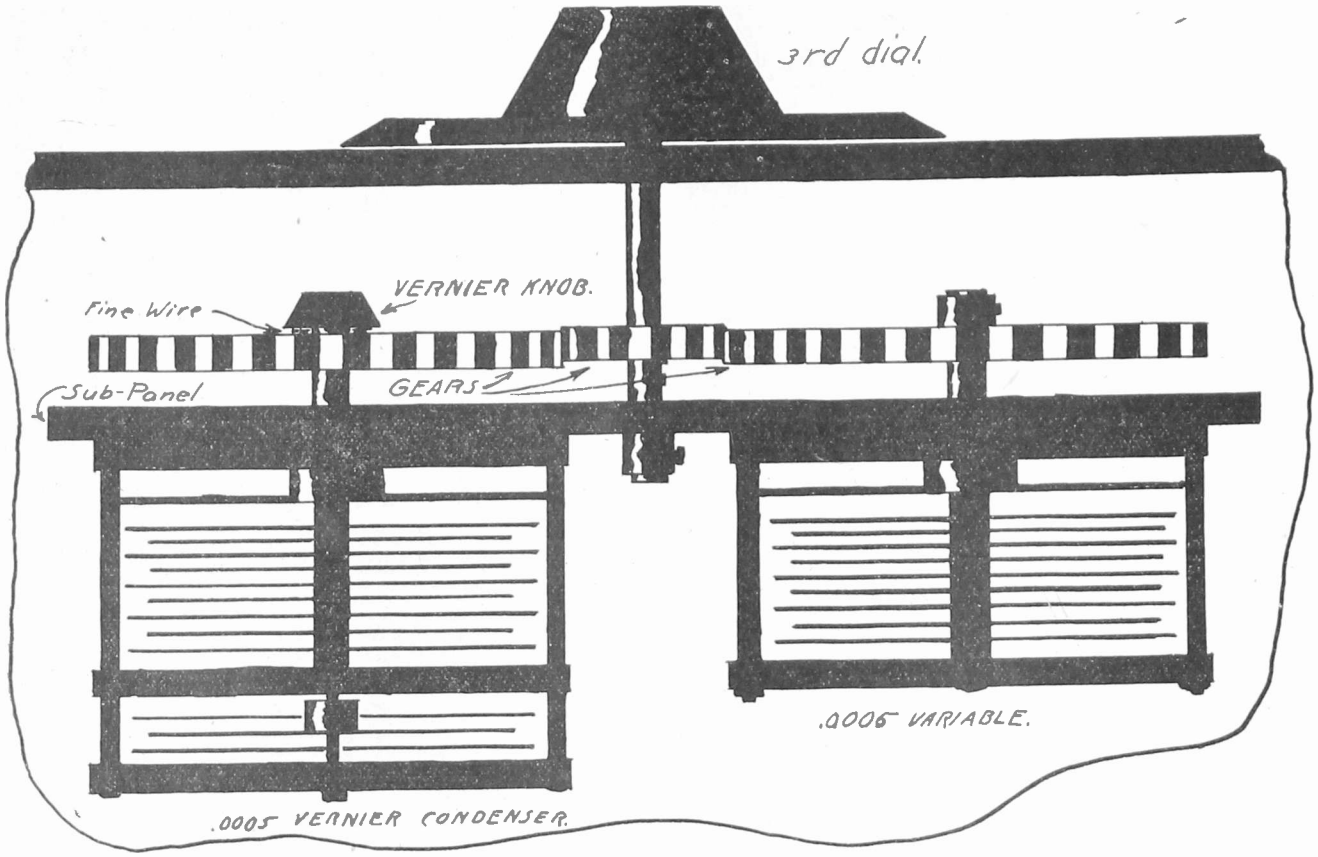
Clears Up Speaker

IT is sometimes of great advantage to place a small condenser across the input terminals of the loud speaker. A slight loss in volume will occur, but this will be compensated by a decided increase in clarity and fewer rattles and microphonic noises.



BRAVING the warm breezes at Atlantic City, these three beauties, having just finished the athletic sport of surf fishing, are listening in to DX stations and having a gloriously good time aboard a houseboat. (Atlantic Foto)

"Super-Six" Neutrodyne Is Devised



SO THAT ONLY THREE CONTROLS ARE NEEDED for a six-tube Neutrodyne, two condensers are tuned by a single knob, by gearing.

By Byrt C. Caldwell

SINCE the announcement of the invention of the Neutrodyne, that receiver has steadily increased in favor until it is now, perhaps, our most popular circuit. The most powerful Neutrodyne receivers which we have at the present time employ five tubes. Many would like a set more sensitive than the five-tube Neutrodyne, but which uses less tubes than the standard Super-Heterodyne models. Ordinarily, it is almost an impossibility to add another stage of amplification to the Neutrodyne, because each stage adds another control, and the five-tube set, with three controls, is practically the limit. Four controls, which would be necessary on a six-tube set, would make tuning impossible for the average person.

There have been many attempts to reduce the number of controls on receivers using tuned radio frequency amplifiers. The fact that the dial settings on all of the condensers are the same when the receiver is tuned to any one wavelength has caused many to make receivers in which all of the condensers are geared together.

The writer has been working on a Neutrodyne receiver using three stages of radio frequency amplification, instead of the conventional two. The mechanical difficulty of setting the condensers together made it inadvisable to describe the receiver for a time. However, the following describes a method which makes this part of the work exceedingly simple.

The illustration shows how two of the condensers are geared together. For simplicity, only the condensers and gearing are shown. The condensers are mounted on a sub-panel, which is placed about two inches in back of the front panel. The illustration shows two geared together. Of course, more can be geared together if desired, but in the receiver described, but two were connected in this manner. This receiver has three controls, the same as the five-tube set. A gear about one inch in diameter is fastened to the shaft of the dial, and two gears, each about three inches in diameter, are put in place of the dials on the condensers, as shown. One of the condensers must be a vernier of the type which has one extra plate, controlled by a knob, the shaft of which passes through the shaft of the other movable plates.

The set is hooked up according to the wiring diagram shown, which is simply the five-tube circuit, with the addition of another stage of radio frequency amplification.

The matter of setting the two condensers together is as follows:

The set is tuned as carefully as possible to a local station, by operating each condenser separately. This sounds easy, but with four controls, it is a great deal more difficult than would be convenient if all stations were to be tuned in in this way. Now tighten the gears to the shafts. Now the two condensers may differ only by the capacity of the vernier plates. The next thing is to tune in some station which is more distant, which does not come in with excessive volume. This will be easier now, with the two condensers set approximately together. When the station is tuned in as strong as possible with the three dials, tune with the vernier knob on the sub-panel for maximum volume. The two condensers are now set exactly together. Now soak a string in melted wax, and care-

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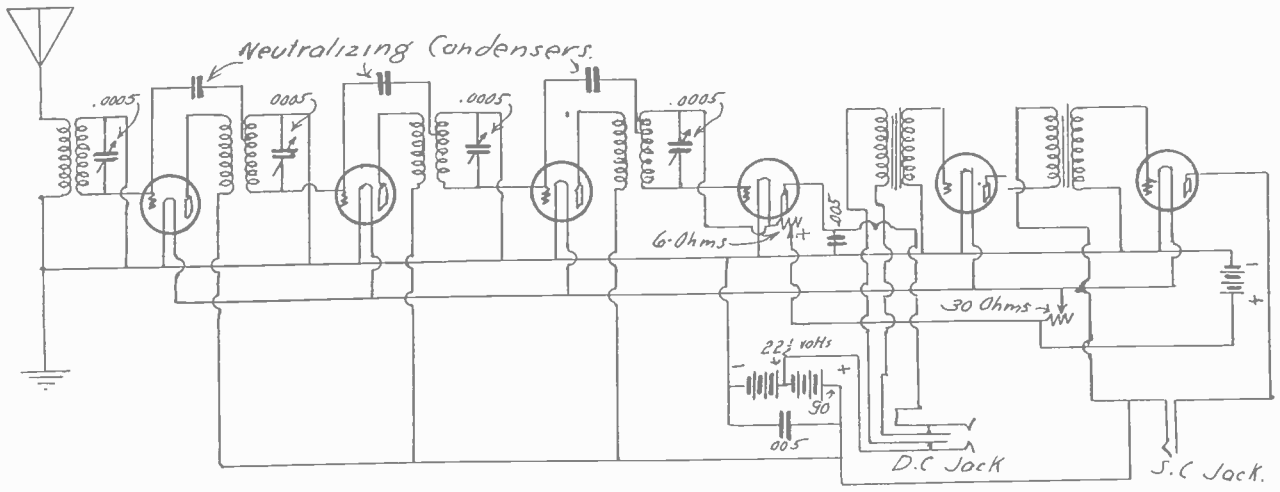
Extra Tube Without an Extra Control



THE "SUPER SIX" NEUTRODYNE comprises three stages of RF, detector and two stages of AF.

(*Concluded from preceding page*)

fully fill up the space between the knob and the gear. When the wax has hardened, the vernier will revolve with the rest of the condenser.

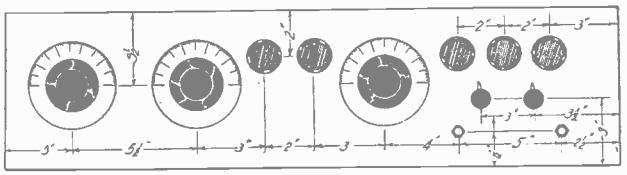
More than two condensers may of course be geared together. In fact, the set may be so made that there will be but one control.

In making the receiver, make sure that the transformers are all wound on exactly the same diameter tubing, and that all have the same number of turns of the same size wire. Use extreme care in arranging the apparatus, so that very short leads are used. It is a good plan to place the sockets after the transformers are mounted on the panel, and then fasten them to the base with brass strip supports of the proper length so that the grid binding post comes to the grid connection of the transformer, and so that the connection to the plate binding post is as short as possible.

Before gearing the condensers together, remove the necessary number of plates from the vernier condenser, so that both this and the plain have the same number.

Except for the gearing of the condensers, this receiver is exactly the same as the five-tube set, and so no instructions for tuning and wiring need be given.

This is an extremely sensitive receiver, and should satisfy the person who desires a better set than the five-tube Neutrodyne, while the fan who wishes a



PANEL LAYOUT of Caldwell's "Super Six" Neutrodyne, showing the three dials that perfectly control operation, though an extra stage of tuned RF is added to the conventional five-tube set. The dimensions for drilling are shown in the illustration.

"monster" set can add a tube or more extra, gearing the condensers together in sets of two, or all together, making a single control receiver. The writer is working on such a receiver, using eight tubes—four radio, detector, and two audio, and one power amplifier, which should be "ready for the world" in several weeks.

Gang Antenna, New Invention, Soon to Appear

THE coupling-tube unit, by means of which several receiving sets may use a single antenna, will be made available to the public soon after June 1, according to Naval radio experts.

This device was invented and perfected by Dr. A. H. Taylor and L. C. Young, of the Naval Radio Laboratory at Bellevue, Md., and has been demonstrated on board the U. S. Battleship Colorado. By connecting a coupling tube unit between each receiving set and the single antenna suspended from the masts, several incoming messages on different wave lengths were received simultaneously, while three messages on other wave lengths were transmitted from the vessel.

Patents on this radio device, which makes the operation of several sets independent of each other, even when receiving on a common aerial, are pending and consequently the inventors do not care to reveal the exact hook-up nor details of the apparatus.

In general, it is said to include a coupling resistance, so high that the strength of the incoming signals are reduced materially, requiring at least a three- or four-tube set. A radio frequency step in the form of a radio frequency trap, which eliminates any regeneration, is required and of course a receiving set with a detector tube. Reception is improved with two tubes of audio frequency amplification.

The military value of the coupling unit to the Navy is very high, since it enables a vessel or station to carry on several times as much business or traffic as has heretofore been possible without interference, and the Navy holds the rights for military use. It has become a part of battleship standard equipment.

To the general public, its chief interest will be that it will permit the use of a single aerial on a large apartment house or hotel, wherein each tenant wants to operate his own set independently of others. A lead-in can be run into each apartment or suite, the owner specifying that each tenant must use a coupler unit and not connect his receiving set directly with the plug in his suite. The honeycomb of aerials on house tops can thus be eliminated, and the one antenna be used by "the whole gang."

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APRIL 26, 1924

Listening to Light

WHAT the future has in store for radio not even the rashest person will dare to say. Nor should the most conservative among us feel that radio is anywhere near its pinnacle.

The future of radio, nevertheless is a fascinating conjecture. Indeed, something more than conjecture prompts the supposition that the radio of another day will play perhaps its most vital part in hearing light.

Some advance in that direction has been made by the distinguished French scientist, General Gustave Ferie, who, by amplifying the currents of photo-electric cells, through bulbs of various powers, rendered audible the light variations from the distant star Capella.

He predicts communication with Mars soon.

And why not? These are parlous times.

Women in Radio

IT is surprising to learn that women are taking to the making of radio sets as a hobby, yet on reflection one might ask: "Why not?" The activities in which women participate this day and age are virtually the same as those that engage the attention of men.

Help Wanted! An Historian for Radio Art

By Herman Bernard

RADIO needs an historian. One valuable thing about history is that it informs us wherein we have changed. Even revolutions in modes of life go unnoticed by the actual revolutionists themselves, if the change has been gradual enough.

Somebody should step forward and tell us in detail, and with charm if possible, how radio has affected civilization. And why stop only there? Why not include the savage, too, halted in his head-hunting perhaps by the Voice of the South, or the chimes of WOR?

Truly, radio came as an unbidden guest in the home which it now rules. The small boy brought it in, more than likely, with his crystal set which proved once and for all that, impossible as it seemed, speech and music certainly did frolic through the air and light on a stretch of wire, restless till they reached human ears.

For sheer diversification radio is the most attractive attraction, the most amusing amusement and the most diverting diversion that ever graced the world.

Besides, it offers a fascination almost beyond description for those whose taste runs to making things themselves—not just mechanically, but thoughtfully and carefully. The mystery in radio, one may soundly expect, will deepen as the ages roll on, greater and still greater possibilities being discovered, only to make more stupendous ones shine forth temptingly.

The expert sits down to wire a set—the school boy sits down to do the same thing. The boy, by some unwitting yet ingenious quirk, may be the one to light upon a momentous improvement in the art.

An understanding history of radio will comprehend all such things—never losing sight of the magic lure of the bulb, while still recording the march of events.

The distribution of glory to those who pioneered in radio, and the story of what they did and what followed, has been told time and again. But where is the volume that treats of the whole with due regard to the interpretive function of history? The suggestion that one may soon come across such a volume is tempting, especially if that work includes an authoritative analysis of radio's effect upon the home, the stage, the movies; of its dominion over the religious and the wayward; its spell over the hearts of the world.

A comprehensive volume is the place for all that. The persevering author searching original sources will not overlook, for instance, the issues of RADIO WORLD, chronicling the new discoveries in circuits, the improvements on them, and the almost inexhaustible variety of adaptations. Nor will he miss future or more serviceable issues.

The reflective side should not be found omitted from such a history. In RADIO WORLD, issue of April 19, a shut-in told her own story of the happiness that radio brought to her—the joy that gushed in where she was virtually a prisoner for life. A brief sketch it was, a literary accomplishment.

Now another instance of a literary lark. Dip, with Joseph Mulvaney, masterful writer, into the noble narratives of other days, and see how radio is demanding its own exclusive place in literature.

What will radio do to fiction? The historian may tell us. Or, maybe far-sighted Mr. Mulvaney has done it in his article to be published next week in RADIO WORLD.

Ignorance is Bliss

(N. Y. Telegram and Mail)

The Radio Woman

Her Radio Gown Crocheted While She Listens In

A NOVEL feat in dressmaking was accomplished by Madeline Phipps when she did all the needlework in making "The Radio Gown" while listening in. The gown was completed in one month, Miss Phipps working about six hours each day.

There are 288,800 yards of cotton thread in the dress. It is crochetted entirely by hand and Miss Phipps asserts it is the only one of its kind. It has a Queen Isabella collar, with shoulder panel dropping to the hips. It is finished off with white radio fan trimming, which, around the waist, is edged in black. The elastic belt line is made of black and the white buzz star of ribbon. The gown was designed as a spring fantasy.

Miss Phipps, who lives in Washington, told the RADIO WORLD:

"When Roxie and his gang came to Washington to give a radio concert, I tuned in to listen. In the meantime I started to crochet, as that is my occupation, and thought of a gown for the spring fashion. When finishing the gown, I decided to call it The Radio Gown, because I only crochetted it when listening on the radio.

"Yes, I am a radio fan and love to listen in while I work."

(Keystone View)

THE RADIO DRESS—Madeline Phipps of Washington, D. C., is shown wearing the radio gown she made from 288,880 yards of cotton thread while listening in

Set Charms Charmers

SEVEN young stage girls of rare beauty, guests at the Sherman Hotel, Chicago, spent an enjoyable evening recently listening to distant stations brought in by the hotel's radio set.

They vowed that there was nothing like radio for whiling away the idle hours, and that cabaret life wasn't in it when compared to a quiet (yet perhaps somewhat noisy) evening "at home."

They are members of the "Little Jessie James" company.

(Foto Topics)

"WE ARE SEVEN," wrote the poet Wordsworth. And, to go him one better (prosaically, not numerically) here "we" are. "Such a feast of beauty seldom graces one's view," was the comment of RADIO WORLD's staff poet, on seeing the photo.

Women Make Sets as Hobby

CORRESPONDENCE received by RADIO WORLD reveals that quite a number of women make radio sets as a hobby. Many of them have these sets in successful operation in their homes. One woman wrote:

"About six months ago I did not know a thing about radio. My younger son, who had a crystal set of which he was very proud, brought in a copy of RADIO WORLD.

"I got interested in reading THE RADIO PRIMER and finally learned enough to understand the diagrams and the accompanying text. Then I decided I would surprise my son and my husband. I spent about $25 on parts and tools and quietly began making a one-tube set.

"And what do you think? The set worked!"

[*Women who desire to tell of their experiences in radio, address The Radio Woman,* RADIO WORLD, 1493 *Broadway, New York City.*]

LZ-126 Prepares to Fly to America

HEREWITH RADIO WORLD *publishes the first details of the radio installation aboard the new Zeppelin LZ-126 furnished by our chief correspondent in Central Europe. The LZ-126 is intended to engage in regular trade trips between Germany and the United States and is German-owned*

By Alfred Gradenwitz

THE airship LZ-126, which, with her first trip from Germany to North America this summer, is to start a regular trans-Atlantic service, will accommodate twenty passengers. Mail service which even in the fastest way takes more than a week, will be reduced to about two days.

The journey between Berlin and New York (about 6,400 kilometers) should be made in about 61 hours, as compared with 168 hours by the fastest steamship service.

The main constructive data of the LZ-126 follows:

Total length, 200 meters; maximum diameter, 27.6 meters; maximum height, 31 meters; displacement, about 70,000 cubic meters; total buoyancy, 81,300 kilograms.

The radio installation is interesting.

With a low consumption of energy, the transmitter is intended to insure a maximum range of about 2,500 kilometers in the case of radio telegraphy and about 500 kilometers in the case of radio telephony above the open sea, while warranting the greatest safety and ease of operation and reducing the weight to a minimum.

This was obtained by the adoption of a 400/200 watt valve intermediate circuit transmitter for an antenna output of 200 watts.

This transmitting post was mounted in the main nacell fitted in the forepart of the airship. This is made up of the valve, rectifier, intermediate circuit and antenna outfit, all combined in the same case through which a supply of fresh air is blown. A special telephone outfit for use in connection with the radio telephone service has been added.

The electric energy required for wave emission is supplied by a generator driven by the propeller and yielding about 1.5 kw. single phase alternate current of 500 cycles and 220 volts with a speed of 3,000 r.p.m.

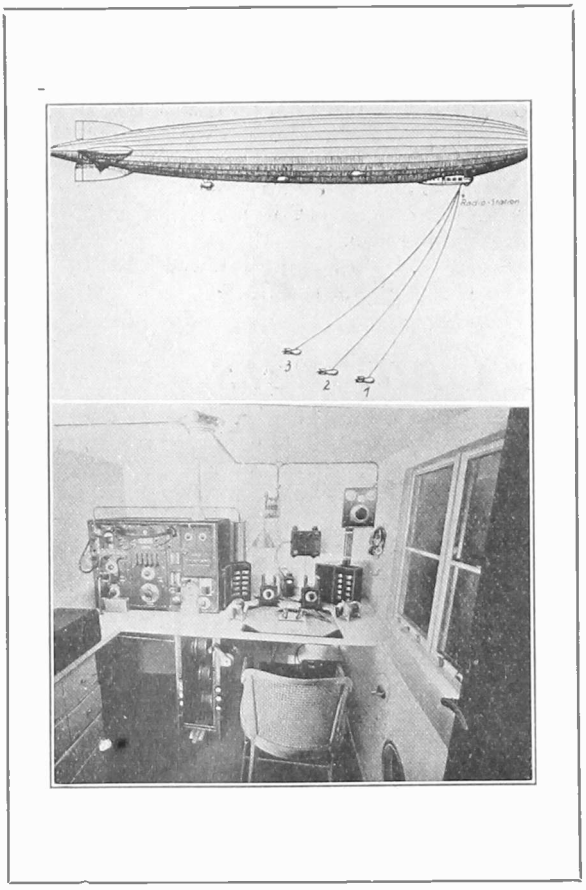
Having been stepped up by a high tension transformer to 2 x 3,000 volts, the alternating current is rectified by two high-vacuum valves and thus supplied to the anode circuit of the 200-watt transmitting valve. The intermediate circuit eliminates any upper harmonics from the wave thus emitted. The wave range of the transmitter is continuous and comprises th einterval of about 500-300 meters.

A fan-shaped antenna comprising three wires each 120 meters in length hanging down from the mast and being arranged to be wound up and down simultaneously by means of three winches is used in connection with the plant above described.

The receiving post comprises two single-valve audion receivers in secondray connection and a two-valve low frequency amplifier, which has been found even over very considerable distances to warrant excellent reception.

In order in the event of the engines being disabled at least to operate the radio post with reduced output, the exciter machine of the alternating current generator is used as motor fed from the accumulator battery provided on board. The transmitter and receiver are accommodated in a special sound-proof cabin free from any traces of explosive gases. The generator and propeller are arranged outside of the cabin and enable the actual wind to be utilized to the best advantage.

The installation was made by the Telefunken Company.



(Radio World)

SKETCH (at top) shows the position of the radio station in the Zeppelin LZ-126, which is supposed to make her maiden flight from Germany to the United States this Summer. The three antenna wires are gracefully drooping from the station. The weights, numbered 1, 2 and 3, keep the wires spaced and balanced. Notice the wing-like rudders on the weights. The lower picture shows the pilot's cabin of the LZ-126. On the left side of the shelf is the combination transmitting and receiving set, all enclosed in one cabinet. The antenna lead runs across the top of the set and down the insulating tube to the antenna. The antenna consists of three wires which, when not in operation, are wound by hand onto the three reels shown under the center of the shelf. The ground lead is connected to the framework of the ship.

Crossed Coil Beacon to Guide Ferries

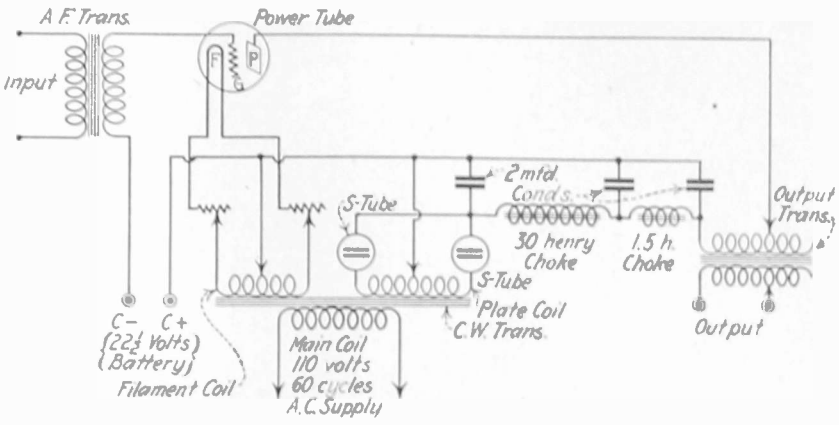
THE crossed coil radio beacon developed at the Bureau of Standards, United States Department of Commerce, has been suggested as a means of guiding ferry boats across San Francisco Bay in foggy weather, and the Bureau believes it will prove very useful for that purpose. This type of beacon marks out a line in the ether and a boat equipped with an ordinary receiving set can tell whether or not she is on that line, and to which side she is off.

The crossed coil beacon consists of two coil antennas crossing each other at an angle of 135°. A coil antenna gives its loudest signal in the plane of the coil and its weakest signal in a line perpendicular to that plane.

One Stage of A. F., But Oh, What Power!

THIS super-power amplifier unit, using only one tube, and employing S-tube rectification, is just the thing for store owners and directors of public places who wish to attract attention.

Not very difficult to build, and only moderately expensive, it is very powerful and sturdy. The S-tubes have no filament, therefore their life is almost unlimited. This is perhaps the most powerful of the amplifiers Charles C. H. White has described in RADIO WORLD.



ONE TUBE power amplification, using filament transformer.

By Charles H. M. White

Consulting Engineer

THE use of radio for extra large rooms, such as hotels and lodges, has made a great demand for amplifiers of sufficient volume to give clear audibility over the entire hall.

Power amplification is the only solution when extreme volume amplification is desired.

Even when power amplification is used it is necessary to select with care the type of loud speaker to be used. In fact, it is better to use several loud speakers if the hall is unusually large.

Another use for power amplification is the common use of setting a loud speaker on the street to give the passerby some bit of music or news.

In such cases very high volume with good quality is paramount since, in most cases, the acoustical properties for outdoor loud speaker work are poor, and unless there is plenty of snap and punch the reception is likely to sound dead or flat.

The great objection to the application of power tubes in amplifiers has been the extremely high maintenance cost so entailed. Power tubes require a very heavy filament current and a much heavier plate current relatively than the non-power amplifier tubes.

Of course, a storage battery can be used for filament supply, but the depletion of the ordinary dry cell type of "B" batteries is very rapid with power tubes. Storage "B" batteries solve the problem scientifically but economically they are expensive and require a lot of care. The logical thing to use is the house lighting service current. This current is always ready at a very low cost and if it be alternating it can be stepped up and down to the voltages suitable for plate and filament supply.

Although the initial cost for filters to smooth out the hum will be rather heavy, still it must be considered that once installed this system is practically free from any maintenance trouble.

Alternating house lighting current has the virtue of being capable of transformation from one voltage to another without the use of rotary machinery, such as motor-generators or converters. The device used for such transformations is called a transformer and is really nothing more than a series of separate coils on a common laminated steel core. The ratio of the turns of the coils is in proportion approximately to the ratio of the desired voltages.

The CW power transformer specified in this power amplifier is nothing more than the standard five-watt transformer which is well known to all amateur operators. There are three separate coils. The main coil, which supplies the power to all the others, is wound for the lighting circuit voltage of 110. The plate circuit coil is so wound that it delivers to the rectifying tubes a voltage of approximately 375.

The filament voltage is ten volts, the voltage required for five-watt radiotron power tubes, allowing for drop in the filament coil and the rheostats.

As long as the grid is taken off the neutral part of the filament supply coil, there is no hum produced by the use of A.C. for filament lighting, but, it is absolutely essential that the plate current be direct and not alternating. Therefore, in the plate supply system filters and rectifying tubes must be used.

For rectifiers I recommend the Amrad S tubes. These tubes work on the principle of cold rectification and do not require power to keep them working such as the thermoionic type. Even after rectification by the S tubes, there are pulsations in the plate voltage which must be smoothed out in order to insure quiet amplification. For smoothing out a filtering system is used This electrical filter consists of three 2.0 micro-farad condensers, one 30 henry choke coil, and, a 1.5 henry coil. This filter removes practically all the hum and the resulting potential applied to the plate of the power tube is virtually direct and uniform. It is advisable to use an output transformer of some type since it would be injurious to pass the heavy plate current of a power tube directly through the coils of a delicate loud speaker.

The best type of output transformer would be a variable ratio transformer that would permit the adjustment of ratio to compensate for the difference in impedance of the loud speaker and the plate circuit of the tube.

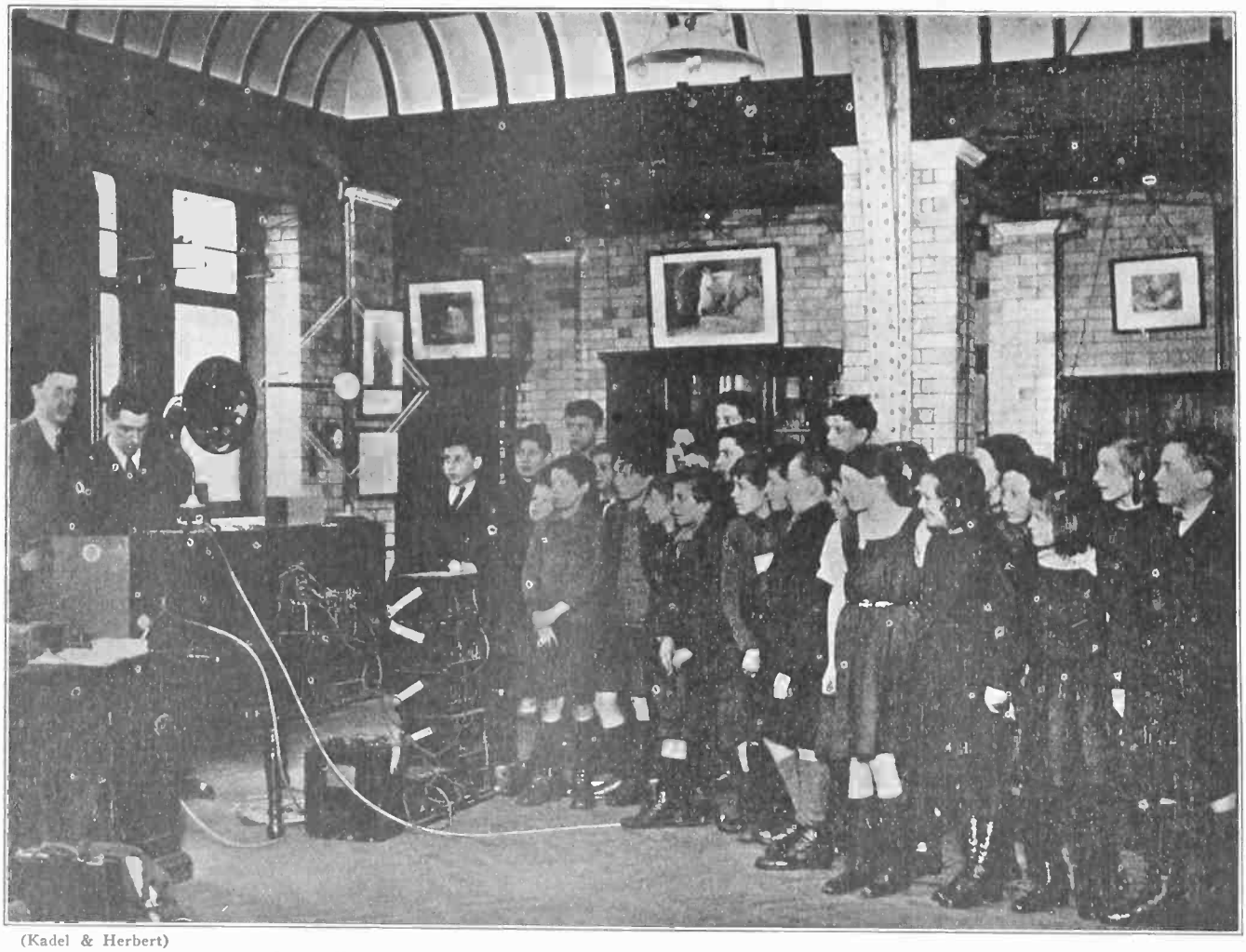
If rheostats are used it is better to use two rheostats and balance the resistance on each leg of the filament, otherwise a hum will be set up due to alternating the bias on the grid caused by upsetting the electrical neutral tap on the filament supply coil.

While this amplifier is primarily intended where unusually great volume and clarity are demanded, still, it does form an ideal amplifier for the home under certain conditions.

Unusually great distance has been covered using this type of audio-frequency amplifier and a receiver consisting of one stage of tuned radio-frequency amplifi-

(Concluded on next page)

Class Gets Instruction Via Ether



(Kadel & Herbert)

SCHOOL CHILDREN in London now regularly receive instruction from a teacher who addresses them by radio. The London County Council adopted this advanced means because one specialist could address all the schools at once. This was done on a musical subject when this photo was taken. Sir. Walford Davies was the speaker. The class in Hugh Wyddleton school is shown in photo. All the schools have loud speakers.

Pepping Up Coils

DURING the construction of a receiver, a man who contemplates doing long wave work most naturally places a bank-wound coil in the circuit. He does not consider that by doing so he is seriously hurting the operation of his set on short waves, due to the dead end effect and the distributed capacity. This term signifies the ability of the turns of a coil which are not being used in an inductance to absorb a certain amount of the strength of the signals. The distributed capacity is the capacity between consecutive turns of the coil, the insulation between each forming the dielectric and the wires themselves forming the plates and the entire having the effect of constant capacity across the coil.

If you want a set that is capable of covering all waves, use the smallest amount of inductance that you can to receive the short waves, and leave binding posts or jacks or some means of plugging in the added inductances when it is necessary to receive the long waves. You will be surprised by the added efficiency when you receive signals on a coil meant for work on 200 to 600 meters and which can be loaded as stated, as against a coil that in itself has a range of up to 3,000 meters.

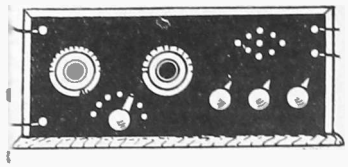
Power Amplifier

(Concluded from preceding page)

cation and a tube detector. Good results were obtained when this amplifier was used with an efficient single tube reflex circuit. But, the best results were secured when this unit was used with a tuned R.F. amplifier, and, a crystal replacing a tube detector. Extreme clarity of volume and pureness of tone on DX work were easily produced. It is much better to accomplish audio-frequency amplification in as few stages as possible. In this way tube noises are not amplified as much.

Take for example a three-stage audio-frequency amplifier. Such an amplifier is just full of tube noises. The second stage amplifies the tube noises of the first and the third stage amplifies those of the second and those of the first passed on amplified through the second. It is then quite obvious that an amplifier consisting of one stage would have far less tube noise relatively than a three-stage amplifier. With power amplification the necessary volume for average use can be secured with one stage.

[*The power and output transformers in this article can be purchased from any of the large radio supply houses handling amateur transmitting apparatus. — Editor.*]



The Radio Primer

Information and Instruction for the Beginner

By Leroy Western

TO the average person who becomes interested in radio, the wiggly lines and intersecting curls of the diagrams seem to be almost an indecipherable maze. Even to one who becomes familiar with the reading of radio diagrams, there still seems to be a mystery surrounding the addition of any instruments to a diagram which he may have in front of him.

The standard method of making connections is shown and described herewith in such a manner that anyone should be able to draw a diagram of any particular tuner or audio frequency amplifier.

In the first place, we will explain the meaning of some of the symbols. Look at Fig. 1 and notice the symbol indicated by L which seems to resemble a loosely coiled spring. This is a symbol for a coil of wire of any type whatsoever. When used in the primary or secondary circuits as indicated, it means a coil of insulated wire wound on an insulating form with an air core. An iron core within a coil is indicated by two or three straight lines drawn through the coil or in the case of transformers, by these same straight lines drawn between two coils of wire. In this case the coils are the primary and secondary. See Fig. 3.

A condenser is indicated by two parallel lines and in the case of a variable condenser, an arrow is drawn through the two at an angle. This can readily be seen at C in Fig. 1. Resistances of any type whatsoever are indicated as shown at R in Fig. 2. When a line is connected to only one end of such a resistance and an arrow indicates a certain point along the "saw tooth" edge, this indicates that the resistance is variable such as is the case in a rheostat. A grid leak, a high resistance, may be connected in either of the ways shown in Fig. 2. In potentiometers, which are not illustrated herewith, connections are made to both ends of the resistance wire and to a variable contact is made. This device is usually used only in radio frequency amplifiers.

The vacuum tube symbol is exceedingly simple. The filament is the only element of the tube to which two connections are made and can thus be readily distinguished. The plate is usually a straight line or a rectangle and the grid similar in appearance to a resistance symbol with, however, only a connection made to one end.

In the first place, it must be remembered that every circuit must be continuous and must run from one point to another without a break. Consider first the primary circuit, Fig. 1. This circuit is seemingly not complete as the aerial hangs off in space and the other side of the primary circuit is connected to the ground. However, the circuit is completed through the ether and the transmitting station to the ground. We connect a variable condenser in series with the aerial and the inductance or primary coil and thence to the ground. The effect of the condenser is to vary the wavelength to which the coil will respond and in a connection of the type shown, the condenser, in effect, reduces the wavelengths of the aerial. If this is undesirable, due to a short aerial, the variable condenser can be shunted across or placed in parallel with the primary inductance as shown in dotted lines. Thus we have a standard primary circuit which indeed is exceedingly simple.

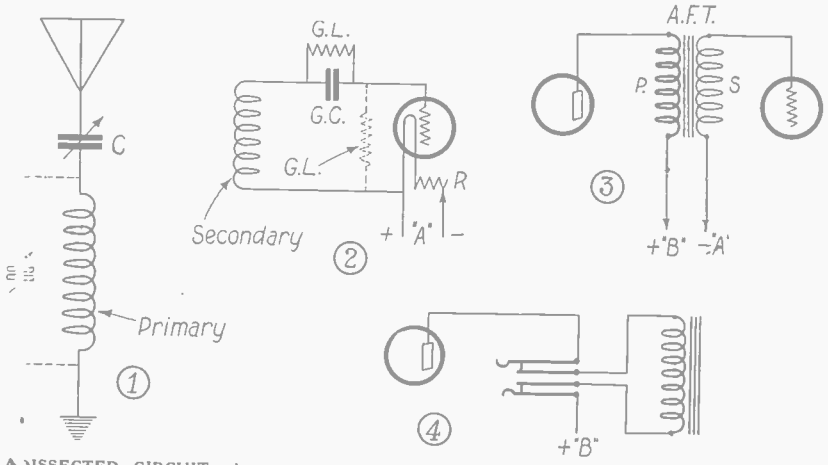
We will next deal with the secondary circuit which may be coupled inductively to the primary or in which the secondary and the primary coils may be one and the same. We have indicated herewith in Fig. 2 a separate coil which may be coupled inductively to the primary. Usually this coil is tuned by placing a variable condenser in parallel with it. The connections then go to the grid and filament in the manner indicated. This is standard and will be found in practically all types of hookups.

The circuit which seems to provoke the most questions is an audio frequency amplifier. This, whether it be one or two stages, is almost invariably connected up in the standard manner. The primary of the transformer is connected in the plate circuit or rather in series with the plate as indicated in Fig. 3. One side of the primary goes to the plate and the other side to the positive of the "B" battery. If this is the first transformer, that is between the detector and first stage, this lead goes to the 22½-volt tap on the "B" battery. If this is the second transformer, or the third in the case of a three-stage audio frequency amplifier, this lead then goes to the highest voltage available. Thus we see that the circuit of a tuner and detector is exactly the same even if audio frequency amplification is added, with the exception of the fact that the primary of the transformer takes the place of the phones. Thus we have a working basis for adding amplification. The phones are then, of course connected in the plate circuit of the last amplifier in the same manner as they were formerly connected in the detector circuit.

Sometimes it is desirable to add a "C" battery in the circuit, whereupon the secondary lead, indicated as going to the negative "A" battery is connected to the negative "C" battery and the positive of the latter to the negative of the "A." The secondary circuit of an audio frequency amplifier is always the same. One side goes direct to the grid of one tube and the other side either to the "C" battery as described or to the negative "A."

Very often the question arises, "How can I add jacks to my receiving set?" Nothing of the sort is true and the connections for a double circuit jack are simple in the extreme. Refer to Fig. 4. Here we see a standard two-circuit jack connected in the plate circuit of either a detector or amplifier. The two center springs are connected to the transformer and the rest of the connections made in the circuit just as if the two outside springs were the terminals of the transformer. So little change is necessary that it can be readily seen from the diagram herewith.

Now turn to one of the other diagrams in this issue of RADIO WORLD. Trace it out. Try it with another diagram and practice a little bit in this way. You will soon become proficient in reading diagrams.



A DISSECTED CIRCUIT, the component parts of which Leroy Western fully explains in the accompanying article.

Beginners' Dictionary

ELECTROLYTE—The liquid contained in storage batteries, which, in those of the lead plate variety, is composed of sulphuric acid and distilled water.

RESONANCE—The tuning of the receiving set exactly to the wavelength of the broadcasting station.

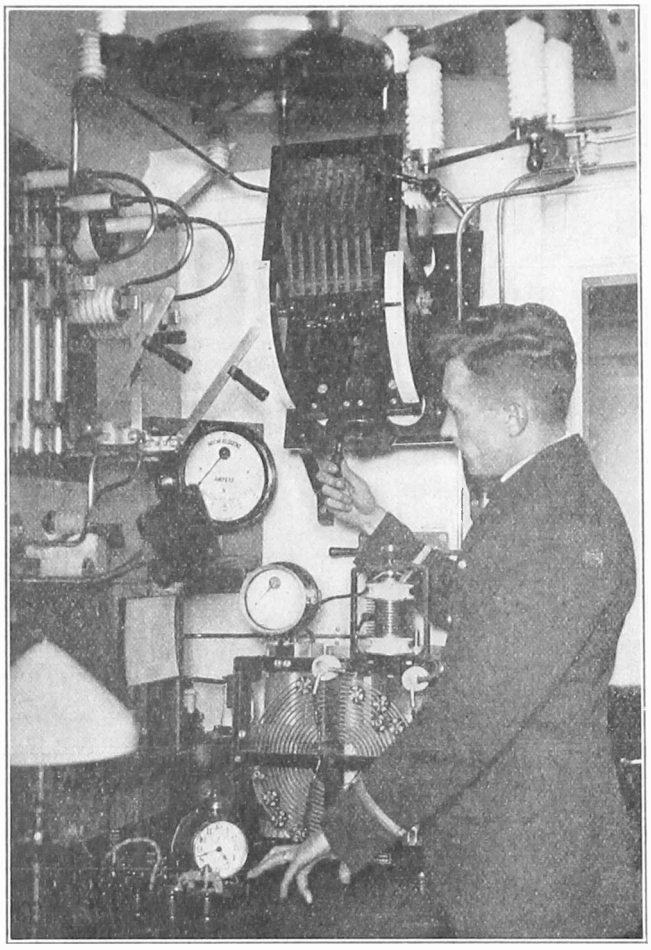
FEEDBACK—A method of regeneration. Feeding the plate circuit current back to the grid circuit, there to be amplified and again passed to the plate circuit, which action theoretically is kept up until the capacity of the tube is reached.

TICKLER—A coil of wire in the plate circuit which is placed in inductive relation to the grid circuit so that regeneration may be caused. It is usually the rotor on single circuit sets.

TUBE FILAMENT—The small high resistance wire inside the vacuum tube which lights up when the proper voltage is applied. The function of the filament is to throw off electrons to the plate.

GRID—A Spiral of wire wound around the filament, not touching it, whose function it is to gather the incoming signals and throw them over to the plate with the air of the electron emission from the filament.

PLATE—A thin piece of flat metal surrounding the grid, whose function it is to receive the rectified signals coming from the grid. The plate is always connected to the positive B battery.



"MOST up-to-date radio apparatus afloat," is claim of owners of the Deutschland, which arrived in New York on her maiden trip the other day. Karl Kasel is adjusting wave length.—(Kadel & Herbert).

The Old Crystal Set

How dear to my heart are the stations far distant,
When faintly my neutrodyne brings them in near;
The whistle, the call and the voice, just a whisper,
The soft strains of music, I hardly can hear.
The wonders of distance are truly alluring,
A fanciful fondness surrounds each new call,
But it never can equal the love long enduring
I hold for my crystal set there on the wall.

Chorus:—

The old bornite crystal,
My time-honored crystal,
The dust-covered crystal,
That hangs on the wall.

How many the times as I sat by my fireside,
The chill of a cold, icy evening without;
I slid the old tuner, till signals were amplified,
Putting my lonely thoughts quickly to rout.
Sure the sounds were so weak I hardly could hear them,
And, hushed, I would listen, attending each word
Of some wild declamation on murder or mayhem,
Or some other fool subject, just as absurd.

On—
The old bornite, etc.

Though it's many long days since I've tasted its pleasures,
My thoughts linger fondly on each shaky part,
The crystal, catswhisker, I count as rare treasures,
And each wabbly connection, so dear to my heart.
Long past are the days when it journeyed forth nightly
To get some weak message, to find some faint call,
But I always will keep it and cherish it rightly,
My old bornite crystal, that hangs on the wall.

Chorus

—N. Y. Telegram and Mail.

Good Advice

on

How to Build America's Best Bad Set

[Follow Directions Carefully, and if the Set Works, Sell it, for it won't for Long!]

I. Select some circuit with ten or more controls, it will take the operator longer to adjust, and 9 out of 10 chances he won't have it tuned as well as if he had only used two or three controls.

II. Pick out the cheapest parts on the market regardless of construction. Most of these parts have loose connections, poor insulating material (moulded mud sometimes called hard rubber), lead spring contacts, etc. This is about the surest way to obtain poor results.

III. Use iron screws, nuts, taps, switch arms, binding posts, shafting, jacks, etc., the conductivity of iron is quite a bit less than copper and brass. These iron parts all add resistance to the poor little current which tries to work its way through the circuits.

IV. When your out to buy a variable condenser, ask the salesman for 43 or 23 plate condenser and you will let *him* know that you don't know a damn thing about radio (if he knows his stuff himself). A 23 plate condenser may have a capacity of .005 m.f. or even a greater capacity than that of a 43 plate one, according to the size of the plates and the space between them, air being used as the dialectric.

V. Make all leads long and indirect, especially in the grid circuit. Most of the squealing effect is caused by your hand coming near the leads.

VI. Don't worry about the antenna lead in, let it wrap itself around the gas pipes, electric fixtures, tack in the wall, etc., this all helps to weaken the little current that does get to the antenna if it don't stop the signals altogether.

VII. In selecting phones, if a click is heard by connecting a 6 volt storage bat across them (as I have seen one do), you may rest assured that the salesman either does not know his stuff, or, is trying to jip you, so tell him to wrap it up, it all goes toward making a rotten set.

My Radio Experience

Let us again remind our readers:

WRITE your experience with radio—anything that is unusual, extremely interesting or that has a new angle. It need not be of a technical nature.

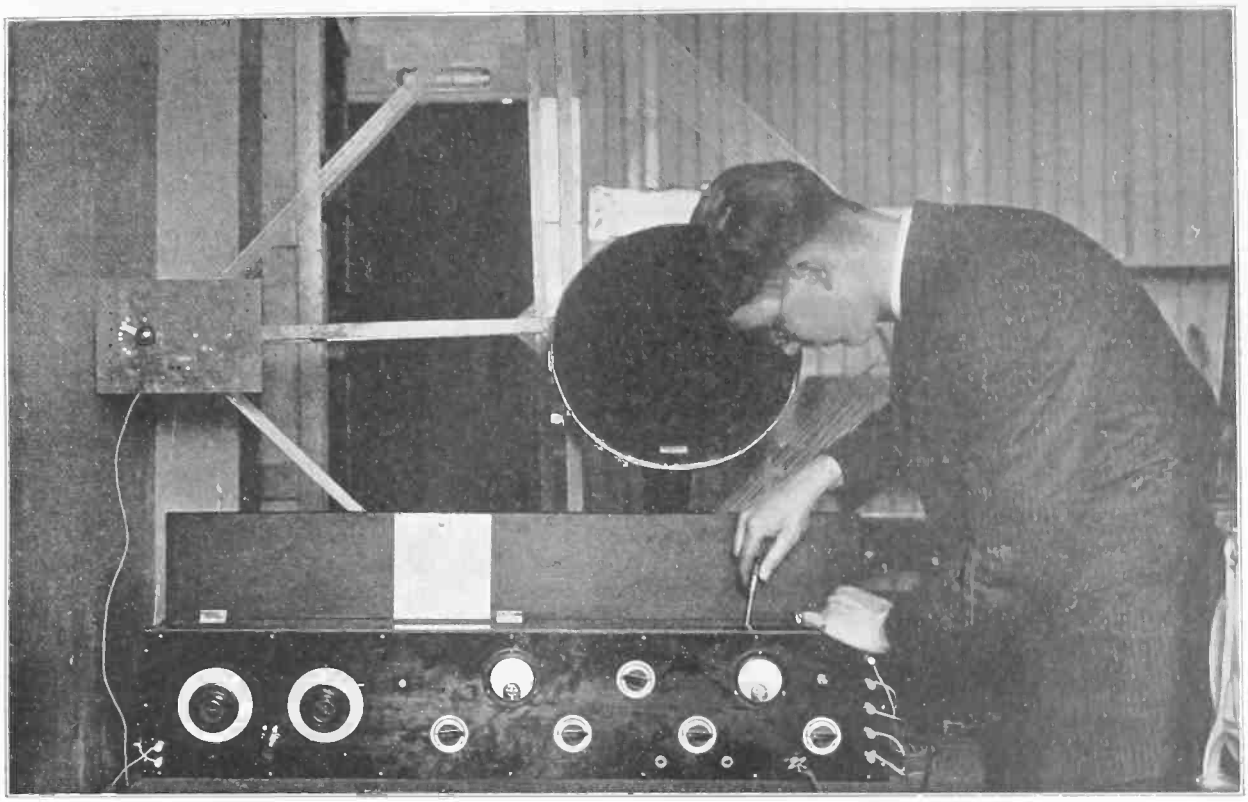
For instance, not long ago, a man living in a Michigan town was using his radio set early in the morning. He smelled smoke, and while making investigations found that there was a fire in the house. Quick action succeeded in saving the lives of his family.

Here is another example: A young man using his head phones at his home on the Maine coast and who understood code heard an SOS call from a ship at sea and discovered that his own father was on the ship which fortunately was saved. In other words, we want TRUE STORIES, that have unusual or dramatic interest and that have happened to our readers.

The best of these will be published from week to week and paid for at our regular space rates.

Write on one side of paper only, and the copy should be typewritten if possible. Articles to be from 100 to 500 words in length. Address, Experience Editor, Radio World, 1493 Broadway, New York City.

Cuba and Scotland ¼-inch Apart!



(Kadel & Herbert)

HERE IS A SET THAT RECEIVED 5SC, Glasgow, Scotland. Frank P. Foley, of 1269 St. Nicholas Avenue, New York City, built this eight-bulb Super-Heterodyne set, using 10,000 meter intermediate frequency transformers constructed by himself. The specially constructed tapped loop aerial makes it possible to tune in on 6KW, Tuinucu, Cuba. By moving the dials a quarter of an inch, Mr. Foley can get KHJ, Los Angeles. On March 17 Station 5SC, Glasgow, was heard with fair audibility. Foley's log book looks like a complete list of broadcasting stations.

Engineering Test May 7

THE United States Civil Service Commission announces the following open competitive examination:

Junior Engineer (Radio)

The examination will be held throughout the country on May 7. It is to fill vacancies in various branches of Government service, at an entrance salary of $1,860 a year.

Applicants must have been graduated with a degree in engineering, preferably in radio engineering, from a college of recognized standing; or must be senior students in such course and furnish within three months from the date of the examination, proof of actual graduation. Applicants who have completed two full years of the engineering course may substitute for each of the additional years, one year of experience in radio engineering.

Competitors will be rated on general physics and chemistry, pure and applied mathematics, practical questions on radio engineering, and education, training and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the Board of U. S. Civil Service Examiners, at the Post Office or Custom House in any city. An early reply is promised to all.

[Announcement of other tests will be published in RADIO WORLD in an early issue.]

Eiffel Tower Concert is Heard in America; First Time on Record

THE first radio concert heard in America transmitted from the Eiffel Tower, Paris, France, was intercepted the other night by Bert Moulton, of Chatham, Mass. Moulton is employed at the Radio Corporation of America coastal station at Chatham, besides operating his own experimental station.

The powerful Eiffel Tower station (SFR), operated by the Compagnie Francaise de Radiophone, used a wavelength of 1,780 meters, and broadcast a special program intended for American listeners between 5 P.M. and 7 P.M., E. S. T.

A receiver employing four tubes was used. Moulton listened to instrumental and vocal selections at 6:10 P.M. and held them until 7:15 P.M.

It was the first time a regular concert from France was received in America. Station SFR used 2,000 watts, twice as much power as American broadcast stations use. The wavelength was much higher than the average broadcasting wavelength.

There had been little previous notice of the test.

Radios for the Maimed

DIRECTOR HINES of the Veterans' Bureau plans to equip all government hospitals with radio. As a preliminary step he has authorized the wiring of hospitals under construction for radio distribution in the following cities: Northampton, Mass.; Tupper Lake and Chelsea, N. Y.; Chillicothe, Ohio; Camp Custer, Mich.; St. Cloud, Minn.; Excelsior Springs, Mo., and Livermore, Calif. Additions being constructed in hospitals in Gulfport, Miss.; Knoxville, Iowa; Little Rock, Ark., and Augusta, Ga., will also be wired for the installation of receiving sets.

Hospitals planned, but not yet started, for Aspinwall, Pa.; San Fernandino, Calif.; Pikesville, Ky.; Great Lakes, Ill., and probably at sites in Pennsylvania, New York and Maryland when definite plans are completed.

All 48 hospitals at present occupied, not yet supplied with radio, will also be wired and equipped as soon as means to meet the expenses can be found, the Director states. Money will be needed for the centrally located receiving sets, and many pairs of phones and loud speakers, and it is hoped charitable institutions or radio manufacturers will aid the government in this plan to bring the outside world to all the veterans in government hospitals.

Communications should be addressed to the Veterans' Bureau, Washington, D. C.

BROADCAST PROGRAMS FROM FAR AND NEAR

Explanation of Time Abbreviations

G. M. T.—Greenwich Meridian Time
E. S. T.—Eastern Standard Time
C. S. T.—Central Standard Time
M. T.—Mountain Time
P. T.—Pacific Time

Station WHN, New York

360 Meters (830 Kcys.). E. S. T.—Apr. 24.—9:30 P. M.—Sara V. Turitz, soprano, singing classical selections. 9:40 P. M.—Lou Gold's Wigwam Club Orchestra. 10:00 P. M.—"Latin-American Program" by All Nations Ass'n. 11:00 P. M.—Sam Lannin's Roseland Dance Orchestra. 11:30 P. M.—Harry Hock Entertainers. 11:45 P. M.—Dorothy Clark, pianist, from the Monte Carlo.

Apr. 25.—10:30 P. M.—Minstrel show by St. Rose of Lima Church. 11:30 P. M.—K. I. K. Entertainers. 11:45 P. M.—Fred Whitehouse Song Review. 12:00 P. M.—Three Ornande Sisters, of the Monte Carlo. 12:15 P. M.—Edith Wilson and Fletcher Henderson of the Club Alabam. 12:30 A. M.—Elizabeth Dougher, soprano. 12:45 A. M.—The Great Sir Joseph Ginzburg. 1:00 A. M.—Dan Gregory and His Dancing Carnival Orchestra. 1:30 A. M.—The McGushion Sisters. 1:45 A. M.—Richard Douglas, tenor.

Apr. 26.—7:30 P. M.—Al Reiser and His Dancing Carnival Matinee Orchestra. 8:15 P. M.—Florie Hutchinson of the Monte Carlo. 8:30 P. M.—Wilbur Sweatman's Orchestra. 9:10 P. M.—Herbert Spencer, pianist and composer. 9:15 P. M.—Katherine Conran, soprano, soloist of the Ressurrection Church, also soloist of the police reserves. 9:45 P. M.—Fitzpatrick Brothers singing "Trinity Chimes" and old time melodies. 10:00 P. M.—Beaux Arts Gold Room Orchestra. 10:30 P. M.—Con Conrad, song writer and composer. 11:00 P. M.—Love Twins of the Monte Carlo. 11:30 P. M.—Rubey Cowan and His Entertainers.

Station KGO, Oakland, Cal.

312 Meters (960 Kcys.). P. T. Apr. 23.—1:30 P. M.—New York stock exchange quotations and weather report. 3:00 P. M.—Short musical program. 6:45 P. M.—Final stock exchange quotations and weather report, news items.

Apr. 24.—1:30 P. M.—New York stock exchange quotations and weather report. 6:45 P. M.—Final stock exchange quotations, weather reports and news items. 8:00 P. M.—Program by Magnavox Company, Millikens Jazz Orchestra; address, "Future of Radio," Herbert E. Metcalf; address, "Radio Engineering," Don Lippincott.

Apr. 25.—1:30 P. M.—New York stock exchange quotations and weather report. 3:00 P. M.—Short musical program. 6:45 P. M.—Closing stock exchange quotations, weather report and news items.

Apr. 26.—12:30 P. M.—New York stock exchange and U. S. weather report. 8:00 P. M.—Feature numbers by University Christian Orchestra of Berkley, Cal., Harold Matthews, conducting; Daisy O'Brien, soprano; Madam Swartfager, violinist.

Station WGY, Schenectady, N. Y.

380 Meters (790 Kcys.). E. S. T. Apr. 24.—11.55 A. M.—Time signals. 12:30 P. M.—Stock market report. 12:45 P. M.—Weather report. 2:00 P. M.—Music and one act play, "The Unwilling Bridegroom." 6:00 P. M.—Produce and stock market quotations; news bulletins. 6:30 P. M.—Dinner music by Romano's Orchestra. 7:45 P. M.—Program by the vocal pupils of John Lloyd.

Apr. 25.—11:55 A. M.—Time signals. 12:30 P. M.—Stock market report. 12:45 P. M.—Weather forecast. 2:30 P. M.—Music and household hints from the U. S. Department of Agriculture. 6:00 P. M.—Produce and stock market quotations; news bulletins. 6:30 P. M.—Children's program. 7:35 P. M.—Health talk, N. Y. State Department of Health. 7:45 P. M.—Comedy, "Such a Little Queen," presented by special arrangement with Mr. Channing Pollock. 10:30 P. M.—Musical program by the Blue Bird Dance Orchestra.

Apr. 26.—11:55 A. M.—U. S. Naval Observatory time signals. 12:30 P. M.—Stock market report. 9:30 P. M.—Dance music by Romano's Orchestra, New Kenmore Hotel, Albany, N. Y.

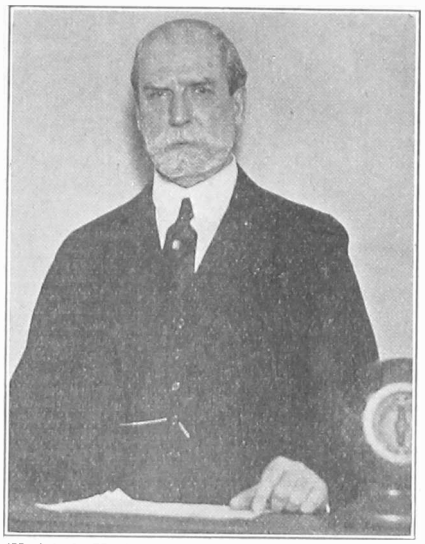
Station WHAS, Louisville, Ky.

400 Meters (750 Kcys.). C. S. T. Apr. 23.—4:00 P. M.—Selections by the Walnut Theatre Orchestra; police bulletins; weather forecast for Kentucky, Indiana and Tennessee.; Just Among Home Folks; late important news bulletins. 4:50 P. M.—Local livestock, produce and grain market reports. 5:00 P. M.—Official central standard time announced. 7:30 P. M.—Agricultural Tabloid talk; concert under the auspices of Mme. Cara Sapin of the Louisville Conservatory of Music; late important news bulletins; official central standard time announced at 9 o'clock daily.

Apr. 24.—4:00 P. M.—Selections by the Walnut Theatre Orchestra; police bulletins; weather forecast for Kentucky, Indiana and Tennessee; late important news bulletins; selections played on the Alamo Theatre organ. 4:50 P. M.—Local livestock, produce and grain market reports. 5:00 P. M.—Official central standard time announced. 7:30 P. M.—One-hour concert by Wayne R. Euchner's Orchestra.

Apr. 25.—4:00 P. M.—Concert by the quartette from Western Kentucky State Normal School, Bowling Green; police bulletins; weather forecast for Kentucky, Indiana and Tennessee; selections by the Walnut Theatre Orchestra; late important news bulletins. 4:50 P. M.—Local live stock, produce and grain market reports. 5:00 P. M.—Official central standard time announced. 7:30 P. M.—Concert by the Junior Class of the Louisville Conservatory of Music.

Apr. 26.—4.00 P. M.—Selections by the Walnut Theatre Orchestra; police bulletins; weather forecast for Kentucky, Indiana and Tennessee; late important news bulletins. 4:50 P. M.—Local livestock, produce and grain market reports. 5:00 P. M.—Official Central standard time announced. 7:30 P. M.—Concert by the Falls Cities' Serenaders.



(Kadel & Herbert)

CHARLES EVANS HUGHES, Secretary of State, is shown making the keynote speech before the Republican State Convention, New York. WEAF broadcast the event.

Station KFI, Los Angeles

469 Meters (640 Kcys.). P. T. Apr. 23.—4:45 P. M.—Evening Herald news bulletins; Examiner News bulletins. 6:45 P. M.—Nick Harris detective stories and concert. 8:00 P. M.—Evening Herald concert Examiner concert. 10:00 P. M.—Hollywoodland Community Orchestra. 11:00 P. M.—Ambassador-Max Fischer Cocoanut Grove Orchestra.

Apr. 24.—4:45 P. M.—Evening Herald news bulletins. Examiner news bulletins. 6:45 P. M.—Y. M. C. A. concert, sales lecture. 8:00 P. M.—Ambassador Hotel concert. 9:00 P. M.—Examiner concert. 10:00 P. M.—Concert arranged by Birkel Musico Co.

Apr. 25.—4:45 P. M.—Evening Herald news bulletins. Examiner news bulletins. 6:45 P. M.—Lillian Hasseries Novelty Five Orchestra. 8:00 P. M.—Evening Herald concert. Examiner concert. 10:00 P. M.—Vocal and instrumental concert. 11:00 P. M.—Ambassador-Max Fischer Cocoanut Grove Orchestra.

Apr. 26.—4:45 P. M.—Evening Herald news bulletins. Examiner news bulletins. 6:45 P. M.—Ruth May Shaffner arranging vocal concert. 9:00 P. M.—Examiner concert. 10:00 P. M.—Popular concert. 11:00 P. M.—Ambassador-Max Fischer Cocoanut Grove Orchestra.

Station WOS, Jefferson City, Mo.

441 Meters (680 Kcys.). C. S. T. Apr. 23.—8:00 P. M.—Address: "Co-operative Marketing vs. Speculation," by D. R. Cowan, Assistant Professor of Rural Economics, Missouri College of Agriculture, Columbia. 8:20 P. M.—Old time barn dance program by the string trio, Louie Barton, lead fiddle, George Schrimpf, bass fiddle and Bryan Williams, guitar.

Apr. 25.—8:00 P. M.—Debate by members of the Missouri University Debate Team on "Resolved: That the United States Should Enter the Permanent Court of International Justice." 8:45 P. M.—"Farm Fellowship," a fifteen minute talk by Secretary Jewell Mayes of the State Board of Agriculture. 9:00 P. M.—Musical program to be announced in advance by radiophone.

Apr. 26.—7:30 P. M.—Complete religious service of the Central Evangelical Church of Jefferson City, Rev. E. W. Burlekamp, pastor, Prof. F. J. Ziesberg, organist.

Apr. 28.—8:00 P. M.—Musical program, the details of which will be announced by radiophone several days in advance.

Apr. 30.—8:00 P. M.—Address: "The Control of Truck Crop Pests and the Control of Rodents" by Otis Wade. 8:20 P. M.—Old time fiddling program given by string band from Lupus, Missouri. Will Hickam, first fiddle; Robt. Moore, second fiddle; Luke Pettigrew, bass fiddle; Jack Hickam, banjo; Joe Hickam, guitar. Note: Weather, grain, butter, egg, poultry, live stock, and special markets on the hour, 8, 9, 10, 11, 12, 1 and 2. 5:05 P. M.

Station WFAA, Dallas, Texas

476 Meters (630 Kcys.). C. S. T., Apr. 28.—12:30 P. M.—Address, Jack Lockeet, blind assistant manager Painters and Paperhangers' Union. 8:30 P. M.—Mrs. Otis Holt, singer; William H. McRaven, pianist, in recital.

Apr. 29.—12:30 P. M.—Address, DeWitt McMurray, editor The Semi-Weekly Farm News, in a medley of humor, pathos and wisdom. 8:30 P. M.—Miss Davis, Miss Talty, Mrs. Max Spangler and the Universal Quartet of Male Voices, in musical recital. 11:00 P. M.—Circle Theatre Orchestra in musical recital.

Apr. 30.—12:30 P. M.—Musical program by the Red-Head Girl of the Dallas Journal.

Station WEAF, New York

492 Meters (610 Kcys.). E. S. T. Apr. 23.—10:30 A. M.—Organ recital direct from the Capitol Theatre. 12:00 M.—Chapel services direct from Columbia University Chapel. 4:00 P. M.—Monroe Goodman and His Club Royale Orchestra; Mary Davenport, contralto. 7:00 P. M.—Synagogue Services under the auspices of the United Synagogues of America; United Cigar Stores Daily Sport Talk by Thornton Fisher; talk by American Agriculturist; one of a series of lectures on Practical American Politics by Schuyler C. Wallace Supervisor of Government, Home Study Dept., Columbia University; concert by the United States Marine Band, direct from Washington, D. C.; "The Chiclet Orchestra."

Apr. 24.—11:00 A. M.—Musical program to be announced. Consolidated market and weather reports. 4:00 P. M.—Rafael Saumell, pianist; Herbert Oestricher, baritone, accompanied by Frances Eschel; Grace Sage, reader; Louis Biamonte, flutist. 7:00 P. M.—Mid-week services under the auspices of the Greater New York Federation of Churches. United Cigar Stores daily sport talk by Thornton Fisher. Jeane Alfred, soprano; concert direct from Hunter College, New York City; duets by Harvey Hindermyer, tenor, and Earle Tuckerman, baritone; Irma Zacharias, violinist, accompanied by Dorothea Zacharias; Vincent Lopez and his Orchestra from the Grill of the Hotel Pennsylvania.

Apr. 25.—11:00 A. M.—Musical program to be announced; market and weather reports. 4:00 P. M.—Dance music by the 400 Club Orchestra; children's hour. 7:30 P. M.—United Cigar Stores daily sport talk by Thornton Fisher; Sigmund Kempner, xylophonist; "The Happiness Boys"—Billy Jones and Ernest Hare; World Mutual Instrumental Trio; B. Fischer and Company's "Astor Coffee" Orchestra.

Apr. 26.—4:00 P. M.—Dance program by the Carolinians Orchestra. Sophia Seitz, contralto, accompanied by Eleanor Owens. 7:15 P. M.—"The Scalpless Kentucky Trail Blazer," by Prof. Howard Driggs of New York University; Paul Whiteman and His Orchestra, direct from the Palais Royale; talk by the Westchester County Children's Association; Eleanor Edson, lyric soprano; Leon Gilbert Simon, baritone; Genevieve Pitot, pianist; Vincent Lopez and His Orchestra, direct from the Grill of the Hotel Pennsylvania.

Station WLW, Cincinnati, Ohio

309 Meters (970 Kcys.). C. S. T. Apr. 23.—10 30 A. M.—Weather forecast and business reports. 1:30 P. M.—Business reports. 3:00 P. M.—Market reports. 4:00 P. M.—Concert for the "Shut Ins," given by the Wurlitzer Concert Company. 8:00 P. M.—Shrine Band.

Apr. 24.—10 30 A. M.—Weather forecast and business reports. 1:30 P. M.—Business reports. 3:00 P. M.—Market reports. 4:00 P. M.—Piano solos by Miss Adelaide Apfel. 10:00 P. M.—Violin recital by Mr. Schima Kaufman.

Apr. 25.—10:30 A. M.—Weather forecast and business reports. 1:30 P. M.—Market reports 3 00 P. M.—Stock quotations. 4:00 P. M.—Special program.

Apr. 26.—10:30 A. M.—Weather forecast and business reports. 1:30 P. M.—Market reports.

Station WGI, Medford, Mass.

360 Meters (830 Kcys.). E. S. T. Apr. 24.—12:40 P. M.—New England weather forecast furnished by the U. S. Weather Bureau. 12:45 P. M.—Closing report on Farmers' produce market report. Live stock market reports. Agriograms furnished by the U. S. Department of Agriculture. Boston police reports, Boston police headquarters daily. 7:30 P. M.—Evening program.

Apr. 25.—12:40 P. M.—New England weather forecast furnished by the U. S. Weather Bureau. 6:30 P. M.—Closing stock market reports. Code practice, Lesson No. 273. Boston police reports. Boston police headquarters. 7:30 P. M.—Evening program.

Apr. 26.—6:30 P. M.—Code practice, lesson No. 274. New England Weather forecast furnished by the U. S. Weather Bureau. New England crop notes. 7:30 P. M.—Talk on current events by David M. Cheney. Concert by Victor S. Wren, baritone. Musicale.

Apr. 27.—4:00 P. M.—Twilight program. 8:30 P. M.—Evening program.

Station WJAX, Cleveland, O.

390 Meters (760 Kcys.). E. S. T. Apr. 29.—7:30 P. M.—Program consisting of bedtime story, a cartoon talk, soprano solos by Miss Geraldine Watrous, songs by Albert Downing, tenor; and a talk by City Manager W. S. Hopkins. Dance numbers by the Bedford Glens Orchestra.

May 1.—8:00 P. M.—One hour of music furnished by the Cleveland Hotel Orchestra. Soprano solos by Estelle Chapin Thomson. Numbers by the Bryan Brothers, a versatile pair.

Station WRC, Washington, D. C.

469 Meters (640 Kcys.) E. S. T. Apr. 24—5:15 P. M.—Instruction in international code. 6:00 P. M.—Children's hour by Peggy Albion. 7:45 P. M.—Dance program by the Better Ole Orchestra. 8:45 P. M.—Song recital to be announced. 9:00 P. M.—A talk on motoring. 9:15 P. M.—Concert by Irving Boernstein's Wardman Park Hotel Orchestra. 9:55 P. M.—Time signals and weather forecasts.

Apr. 25—3:00 P. M.—Fashion developments. 3:10 P. M.—Song recital by Arthur McCormick, baritone. 3:20 P. M.—"Beauty and Personality," by Elsie Pierce. 3:25 P. M.—Current Topics. 3:35 P. M.—Piano recital by Ethel Grant. 4:00 P. M.—Song recital to be announced. 5:15 P. M.—Retransmission of time signals and weather forecasts. 6:00 P. M.—Stories and songs for children.

Apr. 26—5:15 P. M.—Instruction in international code. 6:00 P. M.—Children's Hour by Peggy Albion. 7:45 P. M.—"Wave Meters," by E. L. Hall, of the Bureau of Standards. 8:00 P. M.—Piano recital by Helen Corbin Heinl. 8:15 P. M.—Song recital to be announced. 8:30 P. M.—A talk on the United States Coast Guard. 8:45 P. M.—Song recital to be announced. 9:00 P. M.—Cornet duets. 9:15 P. M.—Piano recital by Mrs. H. H. A. Beach. 9:30 P. M.—Song recital to be announced. 9:55 P. M.—Time signals and weather forecasts. 10:00 P. M.—Concert of Hawaiian music. 11:00 P. M.—Concert by the Hiram College Glee Club.

Station WDAR, Philadelphia, Pa.

395 Meters (760 Kcys.) E. S. T. Apr. 24—11:45 A. M.—Daily almanac. 12:02 P. M.—Organ recital from the Stanley Theatre. 2:00 P. M.—Arcadia Concert Orchestra. Recital—Sister Glady Kumlar, soprano; Edna Finestone, pianist-accompanist. 4:30 P. M.—Recital. Women's Club Hours. 7:30 P. M.—Dream Daddy with the boys and girls.

Apr. 25—11:45 A. M.—Daily almanac. 12:02 P. M.—Organ recital from the studio; features from the studio; Arcadia Concert Orchestra. 2:00 P. M.—Arcadia Concert Orchestra. Playlet—The Philadelphia School of Elocution and Oratory. 4:30 P. M.—Program of popular dance music; results of the relay races and track events of the famous University of Pennsylvania annual meet, will be broadcast, in co-operation with the University Athletic Council direct from the stadium at Franklin Field, Philadelphia. 7:30 P. M.—Dream Daddy with the boys and girls. 8:00 P. M.—Book review. 8:10 P. M.—Author and poets corner. Playlet. Artist recital. 10:10 P. M.—Howard Lanin's Dance Orchestra.

Apr. 26—11:45 A. M.—Daily almanac. 12:02 P. M.—Organ recital from the Stanley Theatre. 2:00 P. M.—The results of the relay races and track events of the famous University of Pennsylvania annual meet, will be broadcast, in co-operation with the University Athletic Council, direct from the stadium at Franklin Field, Philadelphia. (Detailed story will follow.) 7:30 P. M.—Dream Daddy with the boys and girls.

Station KPO, San Francisco, Calif.

423 Meters (710 Kcys.) P. T. Apr. 24—12:00 Noon—Time signals from the Naval Observatory. 1:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M.—Matinee of Indian music. 4:30 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 5:30 P. M.—Children's hour stories. 8:00 P. M.—Organ recital by Theodore J. Irwin. 8:30 P. M.—Program by the Pacific Musical Society. 10:00 P. M.—E. Max Bradfield's Versatile Band.

Apr. 25—12:00 Noon—Time signals from the Naval Observatory. 1:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M.—Organ recital by Theodore J. Irwin. 4:30 P. M.—Rudy Seiger's Fairmont Hotel Orchestra.

Apr. 26—12:00 Noon—Time signals from the Naval Observatory. 1:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M.—Hawaiian music by the Aloha Troupe. 3:30 P. M.—E. Max Bradfield's Versatile Band. 8:00 P. M.—Dance music by Art Weidner's Dance Orchestra.

Apr. 27—11:00 P. M.—Radio church services. 8:30 P. M.—Concert by Rudy Seiger's Fairmont Hotel Orchestra.

Apr. 28—12:00 Noon—Time signals from the Naval Observatory. 1:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M.—Matinee program by the Sunset Trio. 5:30 P. M.—Children's hour stories. 7:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 8:00 P. M.—Organ recital by Theodore J. Irwin. 9:00 P. M.—Program under the management of Rena Lazelle. 10:00 P. M.—Max Bradfield's Versatile Band.

Apr. 29—12:00 Noon—Time signals from the Naval Observatory. 1:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M.—Organ recital by Theodore J. Irwin. 4:30 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 5:30 P. M.—Children's hour stories. 7:00 P. M.—Rudy Seiger's Fairmont Hotel Orchestra. 8:00 P. M.—Program by the Olympic Glee Club. 10:00 P. M.—E. Max Bradfield's Versatile Band.

Station WOC, Davenport, Iowa

484 Meters (620 Kcys.) C. S. T. Apr. 24—10:00 A. M.—Opening market quotations. 10:55 A. M.—Time signals. 11:00 A. M.—Weather and river forecast. 11:05 A. M.—Market quotations and agriograms. 12:00 Noon—Chimes concert. 2:00 P. M.—Closing stocks and markets, including weekly report of wool market. 3:30 P. M.—Educational program. 5:45 P. M.—Chimes concert. 6:30 P. M.—Sandman's visit. 6:50 P. M.—Sport news and weather forecast. 7:00 P. M.—Educational lecture. 9:00 P. M.—Orchestra program.

Apr. 25—10:00 A. M.—Opening market quotations, garden and household hints. 10:55 A. M.—Time signals. 11:00 A. M.—Weather and river forecast. 11:05 A. M.—Market quotations. 12:00 Noon—Chimes concert. 2:00 P. M.—Closing stocks and markets. 3:30 P. M.—Educational program. 5:45 P. M.—Chimes concert. 6:30 P. M.—Sandman's visit. 6:50 P. M.—Sport news and weather forecast. 7:20 P. M.—Sunday school lesson. 8:00 P. M.—Musical program.

ROSALIE GREENE, the stunning 18-year-old leading woman of the WGY Players, who present plays at the Schenectady station for the radio audience. Miss Greene appeared in the Little Theatre production of New York University at Washington Square, New York.

Apr. 26—10:00 A. M.—Opening market quotations, garden and household hints. 10:55 A. M.—Time signals. 11:00 A. M.—Weather and river forecast. 11:05 A. M.—Market quotations. 12:00 Noon—Chimes concert. 12:30 P. M.—Closing stocks and markets. 3:30 P. M.—Educational program. 5:45 P. M.—Chimes concert. 6:30 P. M.—Sandman's visit. 6:50 P. M.—Sport news and weather forecast. 9:00 P. M.—Orchestra program.

Station WBAP, Fort Worth, Texas

476 Meters (620 Kcys.) C. S. T. Apr. 27—11:00 A. M.-12:15 P. M.—Complete services of the First Presbyterian Church. 4:00 P. M.—Organ concert. 5:00 P. M.—Concert by Wylbert Brown and his orchestra. 11:00 P. M.—Popular concert by Fred Cahoon's WBAP Southern Serenaders Orchestra.

Apr. 28—7:30 P. M.—Pupil concert. 9:30 P. M.—Concert by the North Texas State Teachers' College Orchestra of Denton, Texas.

Apr. 29—7:30 P. M.—Concert by Dot Echols McCutchan and assisting artists. 9:30 P. M.—Concert by E. Clyde Whitlock's violin ensemble.

Apr. 30—7:30 P. M.—Concert by Tom Dawson's Mandolin Orchestra of Weatherford, Texas. 9:30 P. M.—Concert by Dick Gaines Dance Orchestra.

Station WSB, Atlanta, Ga.

429 Meters (700 Kcys.) C. S. T. Apr. 24—12:00 Noon—Noon entertainment. 3:30 P. M.—Howard Theatre orchestra overture and prologue. 5:00 P. M.—Vick Myers Melody Orchestra; news markets. 5:30 P. M.—Howard Theatre orchestra overture and prologue. 8:00 P. M.—Musical entertainment.

Apr. 25—12:00 Noon—Noon entertainment. 3:30-4:00 P. M.—Howard Theatre orchestra overture and prologue. 5:00 P. M.—Vick Myers Melody Orchestra; news, markets. 5:30 P. M.—Miss Bonnie Barnhardt's songs and Burgess bedtime story. 8:00 P. M.—Musical entertainment. 10:45 P. M.—Music by the Rainbow Orchestra.

Apr. 26—12:00 Noon—Noone entertainment. 3:30 P. M.—Howard Theatre orchestra overture and prologue. 5:00 P. M.—Music by the Winona Park school orchestra. 5:30 P. M.—Miss Bonnie Barnhardt's songs and Burgess bedtime story. 8:00 P. M.—Musical entertainment. 10:45 P. M.—Rainbow Orchestra.

Apr. 27—11:00 A. M.—Sunday morning services. 5:00-6:00 P. M.—Sacred concert by the Elks' Band. 7:30-9:00 P. M.—Sunday evening service from the Wesley Memorial Church.

Apr. 28—12:00 Noon—Noon entertainment. 3:30 P. M.—Howard Theatre orchestra overture and prologue. 5:00 P. M.—Vick Myers Melody Orchestra; news, markets. 5:30 P. M.—Miss Bonnie Barnhardt's songs and Burgess bedtime story. 8:00-9:00 P. M.—Program sponsored by the Atlanta Junior Chamber of Commerce. 10:45 P. M.—Oldtime music by Fiddlin' John Carson and his cronies.

Apr. 29—12:00 Noon—Noon entertainment. 3:30 P. M.—Howard Theatre orchestra overture and prologue. 5:00 P. M.—Home gardening talk by William B. Deckner; news, markets. 5:30 P. M.—Miss Bonnie Barnhardt's songs and Burgess bedtime story. 8:00 P. M.—Musical entertainment. 10:45 P. M.—Darky spirituals by Bethel Choir No. 2, colored singers.

Station WWJ, Detroit, Mich.

517 Meters (580 Kcys.) E. S. T. Apr. 28.—8:00 A. M.—Setting-up exercises. 9:45 A. M.—Public health service bulletins and talks on subjects of general interest. 10:25 A. M.—Official weather forecast. 11:55 A. M.—Arlington time. 12:00 Noon—Edward Barnes, baritone; LeRoy De Turk, tenor. 3:00 P. M.—The Detroit News Orchestra. 3:30 P. M.—Official weather forecast. 3:35 P. M.—Market reports. 7:00 P. M.—The Detroit News Orchestra; Orvid Owens, pianist; Miss Bessie Lytle, soprano.

Apr. 29—8:00 A. M.—Setting-up exercises. 9:45 A. M.—Fred Shaw, pianist and popular songster, in an "Ironing Day" special program. 10:25 A. M.—Official weather forecast. 11:55 A. M.—Arlington time. 12:00 Noon—Edward Barnes, baritone; LeRoy De Turk, tenor. 3:00 P. M.—The Detroit News Orchestra. 3:30 P. M.—Official weather forecast. 3:35 P. M.—Market reports. 5:00 P. M.—Baseball scores. 7:00 P. M.—The Detroit News Orchestra; Miss Laura Henkel, pianist; Paul Mertz, pianist; Ray Muerer, tenor.

Apr. 30.—8:00 A. M.—Setting-up exercises. 9:45 A. M.—Public health service bulletins and talks on subjects of general interest. 10:25 A. M.—Official weather forecast. 11:55 A. M.—Arlington time relayed by the Western Union. 12:00 Noon—Music by Jean Goldkette's Orchestra. 3:00 P. M.—The Detroit News Orchestra. 3:30 P. M.—Official weather forecast. 3:35 P. M.—Market reports. 5:00 P. M.—Baseball scores. 7:00 P. M.—The Detroit News Orchestra.

Station WOR, Newark, N. J.

405 Meters (740 Kcys.) E. S. T. Apr. 24—6:15 P. M.—Albert E. Sonn in his weekly talk on "Radio for the Layman." 6:30 P. M.—Music while you dine.

Apr. 25—6:15 P. M.—Agnes Leonard in songs for children. 6:30 P. M.—"Man in the Moon" stories for the children. 7:00 P. M.—Concert by the Markell Quartet.

Apr. 26—6:15 P. M.—Music while you dine. 7:15 P. M.—Fred J. Bendel, sports writer. 8:00 P. M.—Gene Ingraham and his Bell Record Orchestra. 9:00 P. M.—Belle Bart, astrologist. 9:15 P. M.—Recital by Phyllis Kraeuter, cellist, assisted by Margaret W. Perkins at the piano. 9:30 P. M.—S. S. Reliance Orchestra of the United American Lines. 10:15 P. M.—Program by the Metropolitan Minstrels.

Station KFIX, Independence, Mo.

240 Meters (1250 Kcys.) C. S. T.—Regular Schedule—Tuesdays, 9 P. M.; Thursdays, 9 P. M.; Sundays, 11 A. M.; Sundays, 7:30 P. M.

Station WIP, Philadelphia, Pa.

509 Meters (590 Kcys.) E. S. T. Apr. 23—1:00 P. M.—Luncheon music by the Tea Room Orchestra. 1:30 and 6:00 P. M.—Official weather forecast. 3:00 P. M.—Artist recital by Loda Goforth, soprano; Albert Zinger, violinist; Rocco A. Poulveiranti, mandolin virtuoso; Dorothy Miller, pianist. 6:05 P. M.—Dinner dance music. 6:45 P. M.—U. S. Dept. of Agriculture livestock and produce market reports. 7:00 P. M.—Uncle Wip's bedtime stories and roll call for the children.

Apr. 24—1:00 P. M.—Luncheon music by the Tea Room Orchestra. 1:50 and 6:00 P. M.—Official weather forecast. 3:00 P. M.—Recital by artist students from the Nan Woerner Vocal Studios. 6:00 P. M.—Harold Leonard's Red Jackets from Club Madrid. 6:45 P. M.—U. S. Dept. of Agriculture livestock and produce market reports. 7:00 P. M.—Uncle Wip's stories and roll call for the children. 8:00 P. M.—Harold W. Lane will talk on "Spring Preparation of Your Tennis Courts and Their Care." 8:15 P. M.—Artist recital by Maud H. Evans, soprano; Mary Ivins, violinist, and Virginia Snyder, pianist. 9:30 P. M.—Talk by Hon. George W. Norris, Governor of Federal Reserve Bank of Philadelphia. 11:15 P. M.—Ted Weems and his Cafe L'Aiglon Orchestra. 1:30 P. M.—Recital by Karl Bonawitz on the Germantown Theatre Organ.

Apr. 26—1:00 P. M.—Luncheon music by the Tea Room Orchestra. 1:30 and 6:00 P. M.—Official weather forecast. 3:00 P. M.—Broadcast of Penn Relay Races from Franklin Field, Univ. of Penna 4:00 P. M.—Radio lesson in Mah Jongg, broadcast from Cafe L'Aiglon. 6:05 P. M.—Jordan-Lewis Dance Orchestra from American Studio of Dancing. 6:45 P. M.—U. S. Dept. of Agriculture livestock and produce market reports. 7:00 P. M.—Uncle Wip's bedtime stories and roll call for the children.

Apr. 26—1:00 P. M.—Recital by Karl Bonawitz on the Germantown Theatre Organ. 1:30 and 6:00 P. M.—Official weather forecast. 3:00 P. M.—Broadcast of Penn Relay Races direct from Franklin Feld, U. of P. 6:05 P. M.—Harold Leonard's Red Jackets from Club Madrid. 6:45 P. M.—U. S. Dept. of Agriculture market reports. 7:00 P. M.—Uncle Wip's bedtime stories and roll call for the children. 8:00 P. M.—"Social Insects" talk by Prof. Marin S. Dunn, Phila. Col. P. & S. 8:15 P. M.—Elks' Frolic broadcast direct from Metropolitan Opera House. 10:15 P. M.—Harold Leonard's Red Jackets from Club Madrid.

Apr. 27—7:30 P. M.—Evening service. 9:30 P. M.—Sunday night concert from Germantown Theatre.

Station WAAW, Omaha, Neb.

360 Meters (830 Kcys.). C. S. T. Apr. 24.—8:00 P. M.—Educational program; next Sunday's Sunday school lesson. Agricultural talk.

Apr. 25.—8:00 P. M.—Marketgrams; bridge lesson.

Apr. 26.—8:00 P. M.—Marketgrams.

Apr. 28.—7:30 P. M.—Studio recital, direction Helen Mackin.

Apr. 29.—8:00 P. M.—Marketgrams.

Apr. 30.—8:00 P. M.—Marketgrams

(Continued on page 20)

Beasts' Roars Broadcast

(Kadel & Herbert)

FOR THE FIRST TIME in the history of zoology, the animals of the forest broadcast through Station WJZ their animal language. Each growled his individual cries into the air, thus doing away with the necessity of having individual letters for each announcer. Is the tiger in the picture trying to shake hands with his invisible public, or is some one teasing him with a stick? Anyway, the beasts look playful enough. They seem so friendly that we would suppose they wouldn't even harm another cat.

(Foto Topics)

THE STAGE MANAGER tunes in for the performers at the City Theatre, New York. Between turns on the stage, the performers snatch a bit of entertainment given by others. It's a case where they never get enough of it. The fact that the girls wear their scanty costumes lends an air of informality to the occasion. The manager reports that a "listen-in" puts the performers in the best humor and makes their

Two Arts Blen

(Kadel & Herbert)

TWO ARTS COMBINED—At the Hotel Majestic, tion was being held (with pictures of Washington to enhance inter

(Kadel & Herbert)

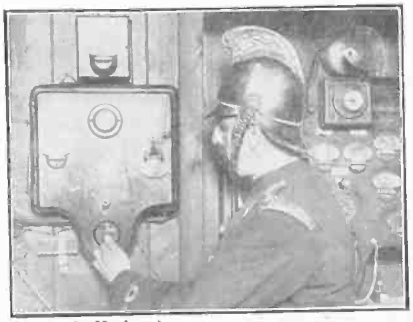
MANY OF OUR OLD INSTITUTIONS are rapid

to Aid the Silent One

ork City, while an art exhibi-
ing) a radio set was installed

ppearing and the hand organ
n becomes popular.

(Kadel & Herbert)
HENRY C. WALLACE, Secretary of Agriculture, speaks from Station WRC, on the work of the department.

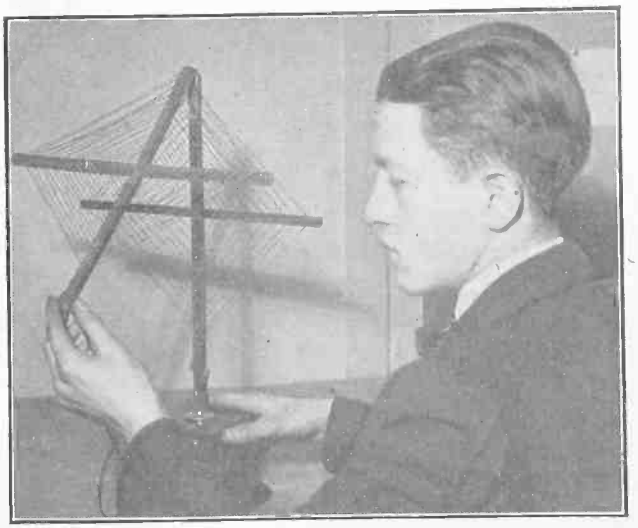


(Kadel & Herbert)
ENGLAND takes the credit for having perfected and established the first radio fire alarm.

Radio 'Rocks Boat'

(Foto Topics)
SAILING, SAILING over the bounding main is now accompanied by the proper music received by radio. A six-tube outfit furnishes the jazz on the City of Seattle (New York to Atlantic City). The set is also an added means of safety for passengers.

(Kadel & Herbert)
SENATOR ARTHUR CAPPER, of Kansas, and Representative John Philip Hill, of Maryland, at Station WRC, Washington, in a debate on modifying the Volstead law. Senator Capper opposed any change. Listeners were asked to vote by mail, acting as judges of the debate, the vote to be submitted to the House.



(Photonews)
ROBERT F. GOOD, of New York City, has invented a twin loop which prevents radiation. It changes a single circuit to a double circuit. It is an aperiodic antenna of ten turns, with a secondary of twenty turns, thus stepping down radiation and stepping up incoming waves.

Programs

(*Continued from page 17*)

Station CKAC, Montreal

430 Meters (700 Kcys.). E. S. T. Apr. 24.—4:00 P. M.—Weather, news, stocks, music; 7:00 P. M.—Kiddies' stories in French and English. 7:30 P. M.—Rex Battle and his Mt. Royal Hotel concert orchestra. 8:30 P. M.—La "Presse" studio entertainment. 10:30 P. M.—Joseph C. Smith and his Mt. Royal hotel dance orchestra.

Apr. 25.—1:45 P. M.—Mt. Royal Hotel concert orchestra. 4:00 P. M.—Weather, news, stocks. 4:30 P. M.—Mount Royal Hotel dance orchestra.

Apr. 26.—7:00 P. M.—Kiddies' stories in French and English. 7:30 P. M.—Rex Battle and his Mt. Royal Hotel concert orchestra. 8:30 P. M.—Frontenac Brewerles Band and artists. 10:30 P. M.—Joseph C. Smith and his Mt. Royal Hotel dance orchestra.

Apr. 27.—4:30 P. M.—Sacred concert.

Apr. 28.—1:45 P. M.—Mt. Royal Hotel classic orchestra. 4:00 P. M.—Weather, news, stocks. 4:30 P. M.—Mt. Royal Hotel dance program.

Apr. 29.—4:00 P. M.—Weather, stocks, news, music. 7:00 P. M.—Kiddies' stories in French and English. 7:30 P. M.—Rex Battle and his Mt. Royal Hotel concert orchestra. 8:30 P. M.—La "Presse" studio variety entertainment. 10:30 P. M.—Joseph C. Smith and His Mt. Royal Hotel dance orchestra.

Apr. 30.—1:45 P. M.—Mt. Royal Hotel concert orchestra. 4:00 P. M.—Weather, stocks, news. 4:30 P. M.—Mount Royal Hotel dance program.

Station CKCH, Ottawa, Can.

435 Meters (690 Kcys.). E. S. T., Apr. 23.—8:30 P. M.—Program by the Chateau Laurier Hotel Orchestra; tenor solos by Mr. C. McAdam; violin solos by James McIntyre.

Station WOO, Philadelphia

509 Meters (590 Kcys.). E. S. T. Apr. 24.—12 M.—Luncheon music by the Tea Room Orchestra. 4:45 P. M.—Grand organ and trumpets. 5:00 P. M.—Sports results and police reports. 9:55 P. M.—United States Naval Observatory time signal. 10:02 P. M.—United States weather forecast.

Apr. 25.—9:55 P. M.—United States Naval Observatory time signal. 10:02 P. M.—United States weather forecast. 10:03 P. M.—Address, Kenneth B. Warner, Secretary American Radio Relay League; saxophone solo, James Rau; address, Frank Conrad, builder of Station KDKA. 10:30 P. M.—Dance program by Earl Gresh and his orchestra.

Apr. 26.—12 M.—Luncheon music by the Tea Room Orchestra. 4:45 P. M.—Grand organ and trumpets. 5:00 P. M.—Sports results and police reports. 9:55 P. M.—United States Naval Observatory time signal.

Apr. 27.—10:30 P. M.—Morning services from Bethany Presbyterian Church. 2:15 P. M.—Musical exercises opening the regular Sunday afternoon session of Bethany Sunday school. 3:15 P. M.—Old time hymns and melodies and sacred chimes recital by the Wanamaker Grand Organ.

Station WBZ, Springfield, Mass.

337 Meters (890 Kcys.). E. S. T. Apr. 24.—11:55 A. M.—Arlington time signals; weather reports; Boston and Springfield market reports. 7:00 P. M.—Music talk by Robert Elisha Stanley Olmsted, professor of vocal music at Smith College; the subjects for tonight are: "The Greatest Songs; a Recital of Masterpieces." 7:30 P. M.—Bedtime story for the kiddies. 9:55 P. M.—Arlington time signals.

Apr. 25.—11:55 A. M.—Arlington time signals; weather reports; Boston and Springfield market reports. 6:00 P. M.—Dinner concert by the WBZ Orchestra. 7:00 P. M.—"The Stampede," a dramatized story. 7:30 P. M.—Bedtime story for the kiddies. 9:55 P. M.—Arlington time signals. 11:00 P. M.—Program of Chamber Music by the WBZ Orchestra.

Apr. 26.—11:55 A. M.—Arlington time signals; weather reports; Boston market report. 7:00 P. M.—Dinner concert by the Hotel Kimball Trio. 6:00 P. M.—Leo Reisman, Ensemble, Hotel Lenox. 6:30 P. M.—Leo Reisman and his orchestra. 8:30 P. M.—Entertainment from Home Beautiful Show, Mechanics Building and from Studio Concert by the Tschaikowsky Quartet.

Station CFCF, Montreal

440 Meters (680 Kcys.). E. S. T. Apr. 25.—8:35 P. M.—Baritone solos by W. H. Dickson; humerous songs, J. Hunter; violin solos, Miss Florence Hood.

Station KFNF, Shenandoah, Iowa

266 Meters (1130 Kcys.). C. S. T.—Broadcasting schedule—Wednesdays and Saturdays, 7:30 to 9:00 P. M. Sundays at 6:30 to 7:30 P. M. 12:30 to 12:55 P. M. each week day.

Station KSD, St. Louis, Mo.

546 Meters (550 Kcys.). C. S. T. Apr. 23.—6:30 P. M.—Program of Abergh's Concert Ensemble, broadcast direct from Hotel Statler. 9:00 P. M.—Program by Alumni of Washington University. 11:00 P. M.—Broadcasting direct from Hotel Statler, dance music played by Rodemich's Orchestra.

Apr. 25.—8:00 P. M.—Studio recital by Mrs. John E. Stoker, soprano; Hunter Jones, pianist.

Apr. 26.—8:00 P. M.—Missouri Theatre Orchestra concert and specialties broadcast direct from the theatre.

Station KHJ, Los Angeles

395 Meters (760 Kcys.). P. T. Apr. 23.—6:30 P. M.—Children's program. 8:00 P. M.—Program presenting the Studebaker Radio Orchestra of Long Beach.

Apr. 24.—12:30 P. M.—Program presenting Helen S. Elworthy, dramatic soprano. Doris Chilcott, pianist, Sylvia Harding, violinist. 6:30 P. M.—Children's program. 8 P. M.—Program presented through the courtesy of the Fitzgerald Music Co.

Apr. 25.—12:30 P. M.—Program of news items; weather report and music. 2:30 P. M.—Program presented through the courtesy of Barker Bros. 6:30 P. M.—Children's program. 7 P. M.—Organ recital. 8 P. M.—Program presenting Ruth Markell, soprano. A play by the Pasadena Community Broadcasters.

Apr. 26.—12:30 P. M.—Program presenting E. J. Goins and the Highlanders. 6:30 P. M.—Children's program. 8:00 P. M.—Program presenting the Mary Christine Albin Trio; Floryane Thompson, soprano.

Station WOAW, Omaha, Neb.

526 Meters (570 Kcys.). C. S. T. Apr. 24.—6:00 P. M.—Every child's story hour. 6:30 P. M.—Dinner program by Ackerman's Orchestra. 9:00 P. M.—Program by Creston (Iowa) Concert Orchestra.

Apr. 25.—6:30 P. M.—Dinner program by Yost's Orchestra. 9:00 P. M.—Recital program by artist pupils of Harry Braviroff.

Apr. 26.—6:30 P. M.—Dinner program by Francis Potter's Mandolin Quartet. 9:00 P. M.—Program by Hotel Fontenelle Concert Trio.

Apr. 27.—6:00 P. M.—Bible study hour under personal direction of Mrs. Carl R. Gray. 9:00 P. M.—Musical Chapel Service by First Baptist Church.

Apr. 28.—6:30 P. M.—Dinner program by Randall's Royal Orchestra. 9:00 P. M.—Program by courtesy of the Woman's Benefit Association of the Maccabees.

Apr. 29.—6:30 P. M.—Dinner program by the Symphonian Orchestra. 9:00 P. M.—Program arranged by Frank Buckingham, banjo, mandolin and guitar.

Station WNAC, Boston

278 Meters (1080 Kcys.). E. S. T. Apr. 24.—12:15 P. M.—King's Chapel service. 1:00 P. M.—Shepard Colonial Orchestra. 4:00 P. M.—Mohawk Serenaders. 6:30 P. M.—WNAC dinner dance. 8:00 P. M.—Colonial Concert Company.

Apr. 25.—12:15 P. M.—King's Chapel service. 1:00 P. M.—Shepard Colonial Orchestra. 4:00 P. M.—Recital by pupils of G. Frank Martin. 6:00 P. M.—Children's half-hour. 6:30 P. M.—WNAC dinner dance. 8:15 P. M.—Hasty Pudding show, "Who's Who."

Apr. 26.—1:00 P. M.—Shepard Colonial Orchestra. 4:00 P. M.—Tea Dance. 8:00 P. M.—Concert program. 9:00 P. M.—Dance music, Copley-Plaza Orchestra, State Ballroom Orchestra.

Station WDAF, Kansas City, Mo.

411 Meters (730 Kcys.). C. S. T. Apr. 24.—3:30 P. M.—D. Ambert Haley's dance and concert orchestra. 6:00 P. M.—Piano tuning-in number on the Duo-Art; marketgram; weather forecast, time signal and road report; the Tell-Me-a-Story Lady; music, Fritz Hanlein's Trianon Ensemble. 11:45 P. M.—Nighthawk Frolic; the "Merry Old Chief" and the Coon-Sanders Orchestra, Plantation Grill.

Apr. 25.—3:30 P. M.—Musical matinee; regular "request" program by the Leo R. Davis "Radio" Orchestra. 6:00 P. M.—Marketgram; weather forecast; time signal and road report; music, Fritz Hanlein's Trianon Ensemble, Hotel Muehlebach. 8:00 P. M.—Novelty Night; program broadcast from Ivanhoe Temple. 11:45 P. M.—Nighthawk Frolic; the "Merry Old Chief" and the Coon-Sanders Orchestra.

Apr. 26.—3:30 P. M.—Musical Matinee; the Riley Ehrhart Orchestra; 6:00 P. M.—Marketgram; weather forecast; time signal and road report; the children's story and information period; music, Fritz Hanlein's Trianon Ensemble. 11:45 P. M.—Nighthawk Frolic; the "Merry Old Chief" and the Coon-Sanders Orchestra.

Station KGW, Portland, Ore.

492 Meters (610 Kcys.). P. T. Apr. 23.—11:30 A. M.—Weather forecast. 12:30 P. M.—Concert by Darby's Orchestra of Cotillion Hall. 3:30 P. M.—Children's program. 7:00 P. M.—Forest protection week talk. 7:30 P. M.—Weather forecast and market reports. 8:00 P. M.—Orchestra concert by Ladies' Columbia Concert Orchestra. 10:00 P. M.—Dance music by George Olsen's Metropolitan Orchestra.

Apr. 24.—11:30 A. M.—Weather forecast. 12:30 P. M.—Concert. 3:30 P. M.—Woman's story program. 7:30 P. M.—Weather forecast and market reports. 8:00 P. M.—Accordion solos by Johnny Sylvester. 8:15 P. M.—Studio program of dance music by George Olsen's Metropolitan Orchestra. 10:00 P. M.—Dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland.

Apr. 25.—11:30 A. M.—Weather forecast. 12:30 P. M.—Program by Peck Holton's Orchestra. 7:00 P. M.—Forest Protection Week talk. 7:30 P. M.—Weather forecast and market reports. 10:30 P. M.—Hoot Owls.

Apr. 26.—11:30 A. M.—Weather forecast. 3:30 P. M.—Children's program. 10:00 P. M.—Weather forecast and dance music by George Olsen's Metropolitan Orchestra.

Station KDKA, Pittsburgh

326 Meters (920 Kcys.). E. S. T. Apr. 23.—6:15 P. M.—Dinner concert by the Pittsburgh Athletic Association Orchestra. 7:15 P. M.—Garden talk 7:40 P. M.—National Stockman and Farmer market reports. 8:00 P. M.—Literary program, interspersed with music. 8:30 P. M.—Special feature. 9:55 P. M.—Arlington time signals; weather forecast.

Apr. 24.—6:15 P. M.—Dinner concert by the KDKA Little Symphony Orchestra. 7:30 P. M.—"Thoroughbred Dogs," by Frank H. Dole. 7:40 P. M.—National Stockman and Farmer market reports. 8:30 P. M.—Concert by KDKA Little Symphony Orchestra.

Apr. 25.—6:15 P. M.—Dinner concert by the Westinghouse Band. 7:30 P. M.—News bulletins. 7:40 P. M.—National Stockman and Farmer market reports. 8:00 P. M.—Radio Boy Scout meeting. 8:15 P. M.—Feature. 8:30 P. M.—Concert by Westinghouse Employes Band.

Apr. 26.—6:15 P. M.—Dinner concert. 7:15 P. M.—Feature. 7:30 P. M.—Story for the young folks. 7:45 P. M.—Last minute helps to teachers of adult and secondary classes. 7:00 P. M.—Feature. 8:30 P. M.—Grant Day dinner of the Americus Club. 9:55 P. M.—Arlington time signals; weather forecast.

Station KYW, Chicago

536 Meters (560 Kcys.). C. S. T. Apr. 24.—7:00 P. M.—Dinner concert. 7:00 P. M.—Joska DeBabary's orchestra. 7:10 P. M.—Clyde Doerr's Orchestra. 7:20 P. M.—Joska DeBabary's Orchestra. 7:35 P. M.—Sport talk. 7:45 P. M.—Talk on "Finance and Market." 8:00 P. M.—"Twenty Minutes of Good Reading," by Rev. C. J. Pernin. 8:20 P. M.—Musical program.

Apr. 25.—6:45 P. M.—Children's bedtime story. 7:00 P. M.—Dinner concert broadcast from the Congress Hotel, Chicago, Joska DeBabary's Orchestra. 7:10 P. M.—Clyde Doerr's Orchestra. 10:00 P. M.—Midnight Revue.

Apr. 26.—9:05 P. M.—Program will be announced by radiophone. 10:15 P. M.—Late show. This show is broadcast from KYW's studio in the Congress Hotel. 1:20 A. M.—Program will be announced by radiophone.

Apr. 27.—11:00 A. M.—Central Church service broadcast from Orchestra Hall, Chicago, Ill., Dr. F. F. Shannon, pastor; musical program under the direction of Daniel Protheroe. 2:30 P. M.—Studio Chapel Service given under the direction of the Chicago Church Federation. 7:00 P. M.—Preliminary service of Chicago Sunday Evening Club. 8:00 P. M.—Regular meeting of the Chicago Sunday Evening Club.

Station PWX, Havana

400 Meters (750 Kcys.). E. S. T.—Broadcasts Wednesday evenings at 8:30 P. M.

(*Concluded on page 28*)

A List Showing the Total Votes Cast Will Be Published in an Early Issue

Who Is America's Most Popular Radio Entertainer?

Everybody is interested in this query: Who is America's most popular radio entertainer? You have your favorite. Who is she or he? Let us know your choice, whether a comedian, an opera singer, a jazz band, or a story-teller.

RADIO WORLD wants to be able to tell the world the name of the entertainer who stands highest in the regard of listeners-in.

Use the accompanying blank and mail to Broadcasting Manager, RADIO WORLD.

Cut off. Fill out. Mail today.

BROADCASTING MANAGER, RADIO WORLD,
1493 Broadway, New York City.

Dear Sir:

My favorite entertainer is.....Station.....
Name .....
Street Address.....
City and State.....

A complete list of broadcasting stations was published in the April 5 issue of RADIO WORLD. *Another list, corrected to the new date of publication, will be printed in an early issue.*

The Radio University

A Question and Answer Department conducted by RADIO WORLD *for its Subscribers by its Staff of Experts.*

Address Letters to Radio University Department
RADIO WORLD, 1493 Broadway, New York City

HERE are several question on the Superdyne receiver which no doubt will be of value to others as well as myself. 1—Can I use No. 20 DSC wire instead of No. 22 as specified for winding the coils in this receiver? 2.—Is there any difference in wavelength between an inductance of 100 turns of No. 24 wire on a 4 inch tube, and the same number of turns of No. 20 wire on the same size tube? 3.—Can I use the radio-frequency tube (UV201A) and the detector, (a soft vacuum tube) on one rheostat? 4.—Although one stage of radio frequency precedes the detector tube, does not this set radiate? 5.—In operation, do the dial readings of the two condensers remain identical, or is there a wide divergency? What approximate position in relation to the secondary windings do the windings of the rotor assume when the set is in operation? 6.—Using 90 volts on the plate, should not a "C" battery be used for best results? 7.—Following the questions and answers in RADIO WORLD, *I note you state that the tickler should be mounted one inch above the secondary. Does that mean the top or bottom windings of the rotor, or the shaft?—E. E. Stetler, P. O. Box 904, Twin Falls, Idaho.*

1.—Yes, you can use No. 20 wire on the coils, but this wire will take up more room than No. 22. 2.—Theoretically there is no difference, except that as in question 1, the length of winding on the coil will be longer. In this manner, the added length of wire equalizes the shorter but thinner wire. 3.—A separate rheostat should be used for the detector tube always. 4.—This set does not radiate when properly built. 5.—The dials are always located at approximately the same points, taking for granted that the tickler is set in a given position for those readings. 6.—A "C" battery should be used in all amplifiers for best results. 7.—The tickler is mounted so that the shaft is one inch above the secondary winding.

* * *

I have constructed the Superdyne according to your specifications. The circuit jumps into oscillation and I am unable to regain control without losing my station. When I am in exact resonance with my station it is very sensitive to body capacity. What can you suggest to overcome this?—R. E. Wilson, 325 Mohawk Avenue, Scotia, N. Y.

You might try different values of B battery, also use an adjustable grid leak. It may be that your present detector plate voltage is too high, thereby causing oscillation before the resonance point is reached, or the grid leak value is insufficient to carry the load. If these fail, try a .5-megohm leak from the grid of the detector tube to the minus a lead.

* * *

What are the parts used in Richard Carlisle's set described in RADIO WORLD *for March 8? Would the lattice wound type variometer work in this circuit?—Frank F. Firman, 133 Logan Avenue, Waterloo, Iowa.*

The parts used in this set are listed in the article. Yes. This type of variometer should work excellently.

* * *

Would two Crosley book type variable condensers work satisfactorily with the Superdyne coils sold by the C. D. Tuska Co. in the Superdyne receiver or would you consider the U. S. Tool Co. condensers preferable to them?—Ernest L. Brudos, Lake City, So. Dak.

It is against the policy of RADIO WORLD to recommend apparatus sold in the competitive field.

* * *

I have built a Superdyne outfit as described in RADIO WORLD, *and although my set seems to be wired up correctly, it will not work right. When I get a station there is a loud whistle all the time. By turning the first tube nearly out sometimes I can bring the station in, but with very poor volume. The distant stations I cannot get at all, because although the carrier wave comes in loud, still when I get rid of this, I lose everything else. I am sure the tickler leads are right as I have tried them both ways. The detector tube seems to spill over all at once and can only be stopped by turning the rheostat all the way out and starting all over again. Can you tell where my trouble might be?—Cecil W. Cranmer, Cedar Run, N. J.*

Your circuit apparently is in a continual state of oscillation. You say that you have tried both ways on the tickler leads. This won't have the effect desired. It is the manner in which the coil is wound that has the effect of reversing the direction of winding. The tickler coil is wound in this manner: Hold the tube in the left hand. Hold the beginning of the wire also in the left hand, leaving the free end pointing away from you. Start winding the wire TOWARD yourself, or in a counter-clockwise direction. This is what is meant by reverse winding. You will find that you can control the oscillation when the coils are correctly wound.

1—In the Neutrodyne receiver appearing in RADIO WORLD *for March 15, will UV199 tubes work satisfactorily with this circuit? 2—Can a loop be used with this receiver? 3—How does the Neutrodyne compare in volume with a 5-tube set, using two stages of radio-frequency amplification? —A. J. Allen, Minford, Ohio.*

1—Yes, UV199 tubes are particularly adapted for use in radio frequency circuits such as the Neutrodyne. 2—A loop may be used, but not with as good results as the outside antenna. 3—The Neutrodyne is nothing more or less than a 5-tube set using two stages of tuned radio-frequency.

* * *

1—On the Superdyne hook-up described in RADIO WORLD *for December 15, to what lead are the stationary plates of each variable condenser connected, also the movable plates? 2—Can the grid lead from the radio-frequency tube be connected direct to the wave-length condenser, and to what plates? 3—Can the ends of the four-turn coil be connected direct from the coil to antenna and ground binding posts, or must the stator have special binding posts for these connections?—R. H. Stearns, 1809 Pittston Ave., Scranton, Pa.*

1—The movable plates on the first condenser go to the negative A lead, and the stationary plates to the grid lead. The second condenser has the stationary plates connected to the plate lead of the first tube. 2—Yes. To the stationary plates. 3—Yes. The binding posts on the stator are only for your convenience in wiring.

* * *

Please publish a diagram of a reflex circuit using one tube, audio-frequency transformer, radio-frequency transformer and crystal detector. I have a vario-coupler and 23-plate condenser which I can use in the tuning circuit.—J. O. Applegate, Hicksville, L. I.

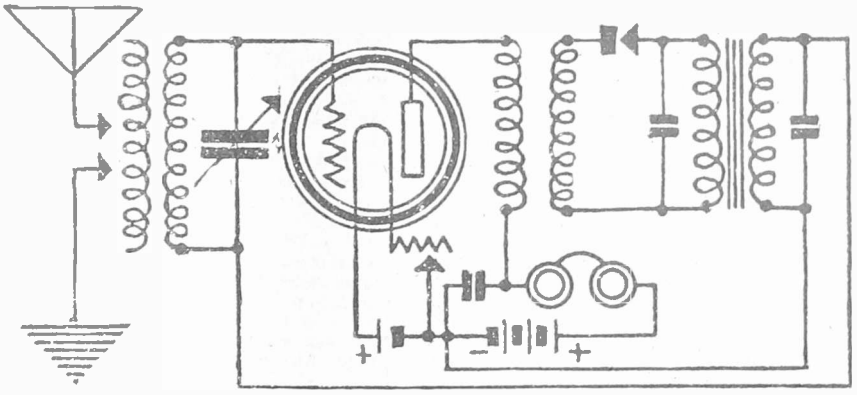


FIG. 5. Reflex circuit diagram asked for by J. O. Applegate

Fig. 5 gives the diagram of a one-tube reflex set using the parts that you have. The fixed condensers are .002 mfds.

* * *

I would like a little information on Richard B. Wilbur's long-distance crystal receiver, as described in RADIO WORLD for July, 1923. 1. Is the tickler coil for the coupler to be wound in the same direction as the primary inductance or in the opposite direction? 2. Would less wire on the coupler make it more efficient and is it necessary to have close coupling? 3. Would there be any advantage in soldering the leads directly onto the switch levers thereby doing away with small losses? In this event the lead wire would not be lengthened because it would be drawn through a hole near the switch arm. Where it is possible to do away with binding posts and substitute direct connections by soldered joints, would any advantage be obtained by doing so? 4. Would it be feasible to supplant the ordinary crystal detector with some good fixed crystal? 5. Will the set not function just as well without the phone condenser? It seems useless to me. If the set is properly built and handled do you claim consistent long-distance reception for it under ordinary conditions or is this only occasional or "freak" reception.—Jos. A. Terstegge, St. Meinrad Seminary, St. Meinrad, Ind.

1. The tickler is wound in the same direction as the primary coil. 2. Less wire on the coupler would not necessarily make the set more efficient. The coupling is determined by experiment while tuning the set. 3. It is of distinct advantage to solder all connections wherever possible. It is a good idea, when practical, to do away with binding posts and substitute direction connections. You are then sure that you have no high resistance connections, and that they won't come off. 4. If you get a good make of fixed crystal, it should function as well as the other kind. 5. The set will work without the phone condenser, but it will be noticed that when speech or music is received, the tone is much improved by its use. Good work can be done with a crystal set under favorable conditions. The writer has heard stations at a distacne of 500 miles on a small crystal set. This, however, was probably during a "freak" receiving condition.

* * *

Where can I get some literature on the White Radiation Killer?—Chas L. Borst, 717 R. St., Atchison, Kan.

For radiation killers, see RADIO WORLD for Feb. 23 and April 12.

* * *

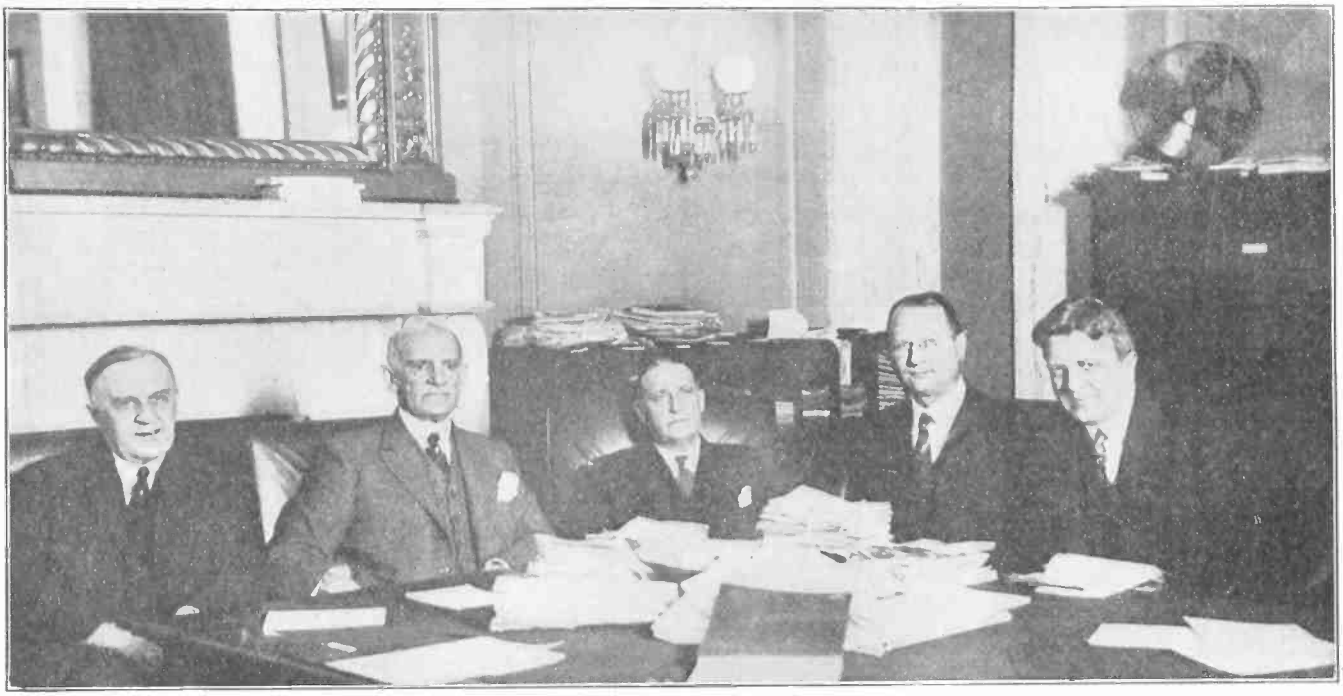
I built a tuned plate reflex after the diagram by H. S. Potter in RADIO WORLD for Oct. 27, but cannot get it to work right. It is hard to tune in and inclined to howl. The crystal detector does not work until after a station is tuned in and the rheostat turned way up. In other words, if the rheostat is not turned on full I can disconnect the crystal detector wihout making any difference in he strength of the signals.—W. H. Roberts, 812 Fifth Ave., North Troy, N. Y.

According to your description, your wiring is incorrect. Your sketch shows several mistakes. The best thing for you to do is to un-wire the set, and re-wire it, following closely the diagram given in the Oct. 27 issue of RADIO WORLD. Watch your transformer connections especially, taking care that you connect the primaries and secondaries where they should be connected. If you wire the set correctly, it is sure to function properly.

I have built the Ultradyne set as published in RADIO WORLD, and it gives excellent results. For some reason or other the condensers only work from one to thirty, the rest of the dial settings being absolutely blank except for clicks as the detector oscillates. This looks to me like too much capacity. Is this so, and what must I do to remedy it?—L. B. Barrett, 103 Howard Street, Bangor, Maine.

You are right. Your condensers are of too high capacity. The way to overcome the difficulty, and have the dial work over the whole range, is to substitute for your present condensers ones having a lesser number of plates. This will also separate the stations a bit more on the dials.

Cohan and Sousa Oppose Dill Bill



(Fotograms)
U. S. SENATE COMMITTEE holding hearing on Dill bill to free broadcasters from music publishers' charges. The committee received 36,000 telegrams, protesting against the tying up of radio broadcasting stations by music publishers and propagandists. Left to right the committee is: Senator Frank B. Brandegee of Conn.; Senator Richard P. Ernst, of Kentucky; Lee Lamar Robinson, clerk of the Senate Committee; Senator Edward S. Broussard, of Louisiana, and Senator C. C. Dill, of Wash., who introduced the bill.

WASHINGTON.

JOHN PHILIP SOUSA, George M. Cohan and others prominent in the musical world opposed the bill of Senator Dill of Washington for the free use of copyrighted musical compositions by radio broadcasting stations.

The fight over the measure is between the American Society of Composers and Publishers, who are against it, and the National Association of Broadcasters, which is in favor of it and already has had a hearing.

The amendment reads as follows:

"The copyright control shall not extend to public performances whether for profit or without profit, of musical compositions where such performance is made from printed or written sheets or by reproducing devices issued under the authority of the owner of the copyright, or by use of the radio or telephone or both."

Defending his bill, Senator Dill stated that many broadcasters, including newspapers, operating at great expense without financial return, had filed complaints against the heavy fees imposed upon the transmission of music to the public. Music publishers are actively prosecuting claims in connection with alleged copyright infringements, while in the only case passed upon, the issue was not clearly defined, he stated. He admitted that the amendment might have to differentiate between broadcasting solely for good will and for profit.

E. F. McDonald of Chicago, President of the National Broadcasting Association, said there are now 530 broadcasting stations, fourteen of which are operated by manufacturers of radio apparatus, twenty-seven by churches and other religious organizations and nearly 100 by educational institutions.

Only two stations make any effort to collect for their services, Mr. McDonald said, one being in New York, where a specified per minute charge is made use by advertisers, and the other in Kansas City, where an experiment is being conducted in collecting a "voluntary tax," from listeners in. He believed neither would be successful.

The witness estimated that the average broadcasting station represented an outlay of $50,000 and cost, "anywhere from $20,000 to $100,000" a year to operate.

To illustrate the wide scope of the industry, the witness said one station received 170,000 replies in a voting contest, and that advertising experts estimated the radio of replies to those reached was one in fifty, giving the single station an audience of 8,000,000. The Chicago stations reached 99 per cent. of the world's population, he added, Java alone being out of the zone of receiving as indicated by correspondence.

Maxim's Visit Brings Praise of U. S.

HIRAM PERCY MAXIM, president of the American Radio Relay League, recently back from his mission to Europe to promote international amateur work, succeeded in stirring up British opposition to hindrances placed in the amateur's path. The United States was lauded for its assistance to amateurs. The latest issue of "The Wireless World and Radio Review" (London) devotes an entire page to "The Visit of Mr. Hiram P. Maxim." It says about the noted American amateur:

On the occasion of the dinner in London, Mr. Maxim gave a most interesting account of amateur activities in America, and in particular, he emphasized the importance of the amateur in the United States. As an example of the status of that body in the States he cited an instance of how, when the broadcasting organization required to be revised, representatives of all interested parties were called upon to send delegates to a conference. The order in which these delegates were called upon to state their views were, first the Government services and next the representative of the organized amateurs.

Mr. Maxim showed that this is the spirit in which the Government departments regard the amateur. No irksome restrictions of any kind are placed on the experimenting amateurs of the United States, but rather every facility is given them to further their interests and the development of their experimental work.

No fees of any kind are exacted for experimental licenses, and the only stipulation is that the amateur will conduct his work in a "gentlemanly manner," with due regard to other users of the ether.

This state of affairs stands out in striking contrast to the position in this country, where it certainly cannot be said that the amateur enjoys any large degree of freedom and where, in addition, he is required to pay fees which appear to be in direct proportion to the importance of his contributions to wireless development and research.

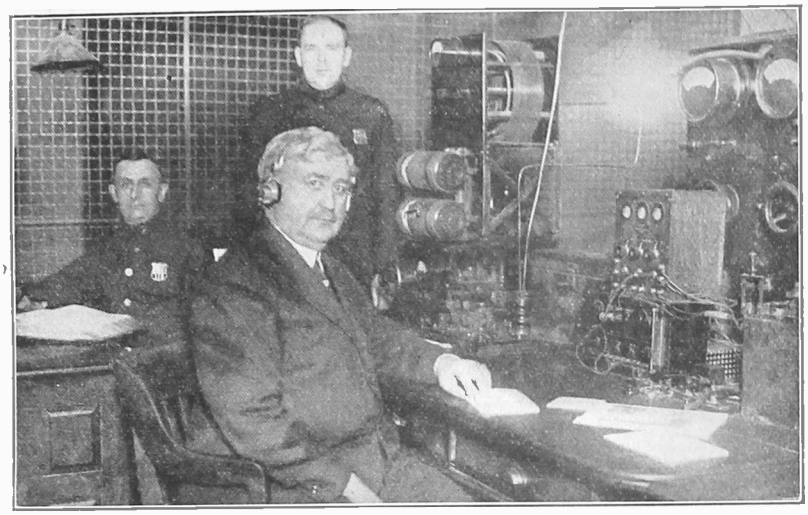
A reference was made by one speaker to the heavy fees demanded by the authorities from those amateurs who wished to take part in transatlantic transmissions on short wavelengths. Mr. Maxim pointed out that nothing of this kind would ever happen in the United States. There are, in addition, no restrictions in the United States as to the nature of communications and as a consequence, messages of greeting can pass by relay from one amateur station to another, right across the continent of America, and even beyond its borders with complete freedom from any interference through violation of Government monopoly in the transmission of communications.

Government departments of this country, and particularly the post office, have established a reputation for inertia, and since international amateur communications have only been achieved within recent months, one must not be premature in criticism of the authorities for not having already expressed their willingness to give additional facilities. No doubt they are giving consideration to the matter.

By RICHARD E. ENRIGHT:

Police Commissioner of New York City

Radio Is Most Efficient in Catching of Criminals



POLICE COMMISSIONER RICHARD E. ENRIGHT at the headquarters wireless station in New York. He is shown listening in.

[*A request for* $30,000 *to equip the city's police force with a radio station was made by Commissioner Richard E. Enright of New York City. The Board of Estimate has the request under consideration.*

The present plant operated by the New York Police Department is the property of the Western Electric Company. It is located in Police Headquarters and has the call letters WLAW. It operates on a 400-*meter wave length and has a radius of several hundred miles. This is the plant, it is believed, the Commissioner desires to purchase with the* $30.000.

The Commissioner discusses radio and the criminal in the following]:

THE criminal today travels very quickly. Formerly he traveled on foot and in the street cars, but today he uses high-powered automobiles. In order to cope with the situation we must always be one step ahead of him. Speed is essential to the prevention and elimination of crime. The speed with which information to police in other cities could be broadcast would make it almost impossible for criminals to escape.

While the telephone has proved invaluable in disseminating information about criminals and robberies, it has disadvantages which could be eliminated by radio. My plan would be to place the radio in about fifty strategic positions throughout the city —at the ferries, the bridges and the points leading from the city. In this way, when a crime was committed, word could be broadcast immediately to these stations and sufficient information given to the police at all the points of escape to enable them to apprehend the criminals.

Sets on the "Beats"

After this I would equip the various stations with sets and possibly install sets on the different "beats," so that patrolmen could keep in touch with headquarters as they now do by telephone.

There are various other ways in which radio could be used. For example, new traffic regulations could be broadcast. It is surprising how long it takes some people to become familiar with new traffic rulings. If these were broadcast for a week in advance, the public would be thoroughly familiar with them before they went into effect.

We could also radiate certain information to people who are leaving the city on vacations. Invariably when people go away they draw their blinds and board up their doorways, telling the criminals in very plain language that they are going away and probably will not be back for some time. Instructions as to what to do when going away could be sent out, and we could also warn these people to forward their new addresses to Police Headquarters or to leave the names and addresses of people with us through whom they could be reached.

Helps in Snowstorm

During a snowstorm word could also be broadcast that if the walks in front of houses were not cleared summons would be issued.

Information about and descriptions of housese were not cleared, summons out which would be of great assistance and value. We have experimented with radio on patrol wagons, but up to the present use in this respect has not proved feasible. We are watching closely all developments of radio as they pertain to use by the police, and as soon as we find that they are suitable to our needs we shall put them into effect.

Do Not Burn Your Tube at Maximum

KEEPING the filament of the tube burning at extreme brightness is expensive.

It cuts down the life of the tube.

A better way to get more volume, if volume is the object, is to put more B battery voltage on the plate.

But do not overload the plate, either. Find out the maximum plate voltage the tube will stand.

That is printed on the slip in the package that contained the tube.

Using Every Available Moment

NOW that a chain of cigar stores sells radio sets and parts, maybe the day isn't far distant when you will enter a quick-lunch restaurant, order ham, eggs, coffee, variocoupler, condenser, etc. and make a set while waiting for the food.

Dealer Glad to Help You

GET well acquainted with your local dealer. He will gladly help you solve your radio problems.

MR. D. X. HOUND

Radio's World's Own Artist Creates An Enjoyable Character

By HAL SINCLAIR

The Radio Trade

The Peak of Perfection Claimed for Battery

THAT the Roberts Storage "B" Battery is now as near perfect as it is possible to produce is the claim of the manufacturer. Only genuine Edison Elements are used.

The battery has a capacity of 1,500 milliamperes. It is equipped with switch levers and taps which give instant voltage changes varying from 16 to 22 on detector tube and 44 to 140 volts on amplifier. It can be recharged for about five cents with the utmost simplicity. With the permanency of the genuine Edison elements and the alkaline solution used instead of acid, it can be said that the battery has an almost everlasting life.

The rubber separators placed in the cells are perforated, thus helping to distribute an even flow of current to the plates of both the detector and amplifier tubes.

A few drops of oil at the top of the solution prevent its rapid evaporation. A metal pan at the bottom of the cabinet catches any overflow when the battery is being charged. It is portable and is mounted in a well-built mahogany finished cabinet which gives it an extremely neat appearance. The panel is bakelite, highly polished and engraved and the terminals match in beauty.

No change in wiring is necessary. There are only three main terminals to connect and a swing of the switch levers gives instant voltage changes on detector and amplifier tubes. For the fellow who likes to "roll his own," the complete parts are offered for home assemblage. The battery comes in four types, made by the Roberts "B" Battery Co., 1120 Myrtle Ave., Brooklyn.

Price to Be Sales Chief for Goldschmidt

JOHN B. PRICE has been appointed New York district manager of the Th. Goldschmidt Corporation and will have charge of the supervision of sales of N & K Imported Phones, N & K Imported Loud Speakers and other radio products which this corporation will shortly put on the market in Northern New Jersey, Greater New York, New York State and Long Island.

Mr. Price was city sales manager for New Era Manufacturing Co., manufacturers of check writers, from 1912 to 1916. He then became field manager for the organization and later was elevated to general sales manager. In 1917 he entered the automobile brokerage business and was successful to the point of building up a business of which he disposed at an excellent profit. In 1920 he became identified with Harper Bros., publishers, as district manager. In 1922, he took charge of the sales of Diamond Products Corporation, a subsidiary of the Diamond Match Co.

Harry Kamen has been appointed New England district manager for Goldschmidt.

Aerial Pipe Mast Does Away With Poles

THE Direct Sales Co., international distributors of the "Friedag" aerial pipe mast fixtures, located at 431 South Dearborn Street, Chicago, Ill., are putting on the market something which thousands of radio fans throughout the world will welcome with pleasure. The Friedag Aerial pipe mast fixtures do away with the clumsy and unsightly wooden poles.

The pipe mast fixtures consist of a cap with a sheave pulley and lugs for guy wires, a collar with lugs, and universal mast head with loop for securing aerial cable. The fittings take standard piping one-half and one-inch sizes, inside diameter. One-inch pipe is 1 5/16 inch outside diameter, while the half inch is about 7/8 inch outside diameter. With these fittings, a complete antenna can be erected in from 15 to 30 minutes. They are made to fit on any pitch roof, or a flat roof, and can be installed without damage.

Set With Sharp Tuner To be Sold Direct

DECISION has been reached by the A. C. Hayden Radio & Research Co., Brockton, Mass., to manufacture the components of a set embodying the A. C. H. Sharp Tuner Dial. The set will be inexpensive. All parts will be mounted and all necessary connections soldered at the factory. The purchaser has only to wire the set, a simple operation fully detailed in the instruction sheet furnished with each set.

There will be provision for plugging in four headphones. The set will be sold only through mail orders.

Gets Tubes From R. C. A.

ARRANGEMENTS have been completed whereby the Radio Corporation of America, which controls the patents for manufacture of Radiotron vacuum tubes, will supply the Freed-Eisemann Radio Corporation, an independent radio manufacturing concern, with vacuum tubes.

Salesmen in New Jobs

E. K. James and J. D. Gibson, formerly salesmen of the A. H. Grebe Co., signed up with Freed-Eisemann and are covering the southern and western territories.

Sales Drive Planned As Tie-Up with Two Political Conventions

DEALERS, manufacturers and jobbers this week began preparations for an active selling campaign this summer.

"Every set owner to get convention news direct."

That was the idea they decided to feature, because the Democratic Presidential convention will be in full blast in New York in June and the Republican convention will get under way in Cleveland soon thereafter.

Peabody Company Enters The Radio Market

HENRY W. PEABODY & CO., large exporters and importers, No. 17 State street, New York City, announce the firm is on the market for radio sets, parts and equipment. They ask that catalogues be mailed direct to their branches as follows: Box 8, Cape Town, C. P., South Africa; Box 5012, Johannesburg, T. P., South Africa, and Box 821, Durban, Natal, South Africa.

Business Opportunties Radio and Electrical

Rates: 40c a line; minimum 3 lines

RADIO OPPORTUNITY—Will sacrifice copyright and stock very novel Radio Diary. Box A, Radio World.

CHEMICAL ENGINEER, manager radio battery factory, will invest in established battery factory with services. Box C, Radio World.

FORD ACCESSORIES, hardware, radio store for rent, 7th Ave., corner Charles St., New York City; present tenant successful three years.

MUSIC AND NOVELTY SHOP—Theatrical section; good radio location; low rent; exceptional opportunity. Box D, Radio World.

POPULAR MAKE BATTERY and ignition; desirable location; profitable cash proposition; ill health. Box E, Radio World.

WE ARE IN TOUCH with $50,000 to $100,000 to invest in the manufacture and marketing of a good radio set; it must be commercially good, with exclusive features; not interested in experiments; write full details, appointment will be arranged. Bobker, 3514 Woolworth Bldg., New York City.

RADIO BUYER AVAILABLE—Has extensive radio merchandising experience, knowledge of every phase of radio industry and department store methods; recently buyer and manager for one of New York's largest radio retailers, seeks reliable connection; can improve and enlarge your radio business. Box 111, Radio World.

Nation-wide Protest on Radio Tax

A NATION-WIDE protest has followed the proposal of the Senate Finance Committee to impose a 10 per cent. tax on radio sets and parts, to be levied on the manufacturer. The newest outstanding developments are:

1. Telegrams, letters, phone calls and personal interviews have brought to the attention of Chairman Reed Smoot and his confreres the strong objections to singling out the "infant industry" and arbitrarily classifying the radio as a "luxury," like Mah Jongg, yet taking private pleasure yachts out of that class. Associations interested in radio have adopted resolutions of protest and forwarded them to the committee. Manufacturers, dealers, jobbers, amateurs and fans have joined the mighty chorus of protest in one of the greatest mass efforts to kill an unwarranted tax that the committee has ever noticed.

2. President Coolidge and Secretary of Commerce Hoover are opposed to the principle of such a tax.

3. The R. C. A., by President Harbord, added its protest and disclosed that patents on one of its sets alone have cost the corporation between $7,000,000 and $8,000,000.

GENERAL JAMES G. HARBORD, president, Radio Corporation of America, in a statement explained that the corporation would not use its broadcasting stations (WJZ and WJY, New York, and WRC, Washington) to argue the merits of the proposed 10 per cent tax on radio sets and parts. While expressing opposition to the tax, he said the policy at these stations was one of "neutrality" in broadcasting programs.

Attached to this statement was a copy of his letter to the Senate Finance Committee, defining the corporation's reasons for opposing the tax. This form of expressing opposition, he explained, was used following the receipt of information that the committee would consider written arguments, but not extend the privilege of speech-making.

In his letter, General Harbord says in part:

"Attention of the Radio Corporation of America has been called to the fact that in considering the proposed new Revenue Act, the Finance Committee has provided for a tax of 10 per cent to apply at the source of manufacture on radio receiving sets selling for $15 or more.

"The Radio Corporation respectfully submits that the proposed tax on radio receiving sets is unwarranted and should not be imposed, among other reasons for the following namely:

"A radio receiving set is not a luxury, but constitutes an apparatus primarily for instructive, educational and other useful purposes, being particularly suitable for use on farms and in remote and isolated sections.

"Radio receiving sets as now manufactured comprise almost exclusively patented devices and parts. The acquisition of the patents necessary to permit the manufacture of sets has necessarily been costly. *In one set alone nineteen different patents are involved, which cost the producers between seven and eight million dollars.* The manufacturing cost of such sets must naturally, during the infancy of this industry, include outlays for patents and continued experimental and development work. It is, therefore, already relatively high. The imposition of a tax at this stage would necessarily still further increase the price to the customer, would naturally militate against the marketing of sets, and thereby would deprive many persons of the beneficial uses of radio."

Coolidge and Hoover Oppose Principle of Taxing Radio Sets

WASHINGTON.

NEITHER President Coolidge, who is opposed to all new or additional taxes, nor Secretary Hoover is in favor of the tax on radio, but both appreciate that legislation is in the hands of Congress.

The Secretary of Commerce has always declared himself against license fees for receiving set owners, but is not in a position to oppose a revenue tax of this sort, as it is outside his jurisdiction.

Tax an Unjust Penalty, Protest Made to Senate

THE American Radio Association, No. 50 Union Square, New York City, a nation-wide association of listeners-in, has joined with the Radio Trade Association and the National Association of Broadcasters in protesting against the proposed ten per cent. tax on radio sets and parts.

Alfred M. Caddell, Secretary of the A. R. A., sent the following telegram to United States Senator Reed Smoot, Chairman of the Senate Finance Committee:

"This proposed tax strikes directly at the heart of radio progress and its effects would be felt in every farm home and city dwelling throughout the land. It would place a penalty upon universities, hospitals and religious institutions that are just now feeling their way toward a larger use of radio, to say nothing of the penalty imposed on amateurs who have contributed so nobly toward the progress of this new science of communication. A tax on radio apparatus therefore would be a direct tax on the greatest educational and uplifting influence in the world. The radio industry has been staggering for the past several years under many costly problems and has been trying to put the foundations of stability under this scientific blessing. Proposals of a tax, especially at this period of the industry's growth, seem most inopportune."

Henry M. Shaw, president of The Radio Trade Association, said:

"The tax is to be on 'completed radio sets," and we in the trade are anxious to know just what the Senate Finance Committee defines as a completed radio set."

A united trade protest is planned.

Text of Radio Tax Clause

WASHINGTON.

THAT part of the tax bill, as reporter out by the Senate Finance Committee, governing radio, follows:

"Radio receiving sets, 10 per centum. Parts and accessories for radio receiving sets, sold or leased to any person other than a manufacturer or producer of such sets, 10 per centum."

Readers Ask for Literature

[The names and addresses of readers who welcome literature and catalogues from dealers and manufacturers are published on request. Address Service Editor, RADIO WORLD, 1483 Broadway, New York City.]

Martin B. Jones, School Supply Co., Columbia, S. C.

James E. Miller, Room 29, Grosvenor House, 21 Old Court St., Calcutta, India.

Radio Club, Lombardo, via Amedai 8, Milan, Italy.

Elwood Campbell, Allan, Sask., Canada.

John McPeck, Box 276, Paden City, W. Va.

H. W. Coblentz, 722 W. Fayette St., Baltimore, Md.

Edward Young, Country Club, Lakewood, N. J., seeks agency to sell complete sets.

Evan McLaughlin, 1841 E. Villa St., Pasadena, Calif.

John Doron, 325 North B Street, Hamilton, Ohio, is in the market for condensers, cabinets, transformers, dials, panels, sockets, and all other accessories, as well as complete receivers.

TRADIOGRAMS

DAVID KANOFSKY, head of the chain stores operated and known as the Liberty Radio Company, brought suit against the Liberty Radio Corporation on the ground the company had spent thousands to make their trade name internationally known and the corporation unlawfully gained by the similarity in trade names. The corporation agreed to change its name to Kor Radio Company.

COMING EVENTS

April 26 to May 3.—Third Annual Better Homes and Building Exposition, Fifth Regiment Armory, Baltimore, including section set aside for a radio show. Home installations from the viewpoint of interior decoration will be featured.

* * *

April 28.—Conference at Bureau of Standards, Washington, to standardize dry cell battery types and specifications.

* * *

September 22 to 28.—First Annual International Radio Show, Madison Square Garden, New York.

New Corporations

Voormac Radio Corp., New York City, $4,500; J. B. O'Reilly, E. J. Vornwald. (Attorney, D. G. McConnell, 97 Warren St.)

Wallace Radio Co., New York, 200 shares common stock, no par value; J. C. White, H. A. Wallace, S. P. Mackenzie. (Attorneys, Lewis & Kelsey, 120 Broadway.)

Singer Radio Corp., N. Y., $5,000; B. G. Singer, V. M. Keane, L. Birnbaum. (Attorney, L. M. Friedman, 132 West 43d St.)

Hall-Thompson Co., Utica, N. Y., electrical merchandise, $40,000; H. R. Hall, J. P. Thompson, R. D. Sherman. (Attorney, W. S. Mackie, Utica.)

Consumers Battery Corp., Wilmington, Del., manufacture, $2,000,000. (Corporation Service Co.)

DESIGNATION.

The Secretary of New York State is named as representative of the Wholesale Radio Equipment Co., N. J., $500,000, for the purpose of receiving service of legal papers, etc.

DELAWARE.

Hobsons Music Stores, Wilmington, manufacture radio apparatus, $500,000. (Corporation Trust Co. of America.)

Hitch Puts Music Fund Off Till the Fall

"Ample Contributions Collected," Says Committee Headed by Clarence H. Mackay, but Present Time Is Deemed Unsuitable

SUCCESS PROMISED

THE Radio Music Fund Committee, which was organized in New York last February by Clarence H. Mackay and others for the purpose of raising funds by voluntary contribution to pay famous musical artists for broadcasting, announce that it had collected "ample contributions" to give a number of concerts, but that the present time was unseasonable to undertake the work, and therefore it would hold the funds intact over the Summer and give the concerts in the Fall. The only alternative, its statement says, would be to return the contributions and abandon the work.

This statement is the first to come from the committee in some time. When the "war for the air" started some weeks ago, the fact that the committee already had announced it would work through WEAF, the station of the American Telephone and Telegraph Company, caused it to be charged by interests unfriendly to that concern with being a "telephone trust" annex. At that time an unofficial report was published that it would cease its activities until the dispute had terminated, in order that its work might not be laid open to misconstruction. Since that time little had been heard of its activities.

The statement issued was made in the names of the organizers of the fund, Mr. Mackay, Felix M. Warburg, Frederick A. Juilliard and A. D. Wilt, Jr., who, the statement said, "desire at this time to make a report of their activities to the contributors to the fund and the public." The statement says further:

"If in the Fall the committee should be unable to obtain the services of artists of sufficiently high calibre, the money will be returned to the contributors and the plan abandoned.

"In dealing with the entire situation the committee has been actuated solely by the desire to serve the radio public, independent of the radio station or group interests. While regretting keenly the necessity for delay, the committee feels that by holding and increasing the fund and using it more effectively next Fall, it will best accomplish the purpose of its contributors and the desire of the radio audiences.

"The committee wishes to state that the Central Union Trust is contributing the entire expense of handling the fund, and, consequently, none of it has been spent."

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS

5 CENTS A WORD. 10 WORDS MINIMUM

DX Lends Enchantment to the Ear

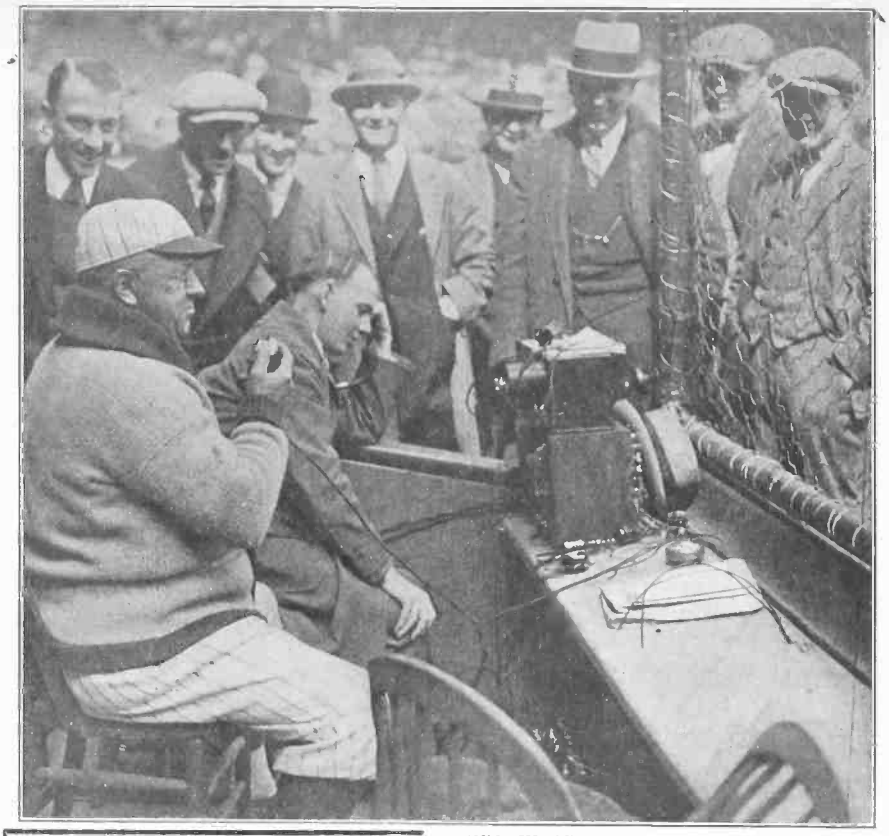
Enough for a Call Book

From J. E. Herman, 1210 Battery St., Little Rock, Ark.

I have an Atwater-Kent 5-tube set. My aerial is 80 feet long, two wires, and about 40 feet high. I have heard 2LO at London on my set during the trans-Atlantic tests. Following find a list of stations heard during three nights, two hours each night. I consider this a good record. I heard 29 stations in one hour last Saturday night. These are stations heard in three nights:

WMC, Memphis, Tenn.; WDAF, Kansas City, Mo.; WHB, Kansas City, Mo.; WOQ, Kansas City, Mo.; WOS, Jefferson City, Mo.; WBT, Charlotte, N. C.; WOAN, Lawrenceburg, Tenn.; WCAV, Little Rock, Ark.; WCAP, Washington, D. C.; WEAF, New York, N. Y.; NAA, Washington, D. C.; WDAP, Chicago; WJAZ, Chicago; KYW, Chicago; KDKA, Pittsburgh; WFAA, Dallas, Texas; WJAD, Waco, Texas; WOAW, Omaha, Neb.; WOR, Newark, N. J.; WPAC, Okmulgee, Okla.; WOO, Philadelphia; WIP, Philadelphia; WWAC, Waco, Texas; WHA, Madison, Wis.; WTAS, Elgin, Ill.; WOC, Davenport, Iowa; KLX, Oakland, Calif.; WLAC, Raleigh, N. C.; WNJ, Albany, N. Y.

KDZQ, Denver, Colo.; FKDB, San Francisco, Calif.; WPAZ, Charleston, W. Va.; WRAV, Amarilla, Texas; WRAY, Scranton, Pa.; KFEV, Douglas, Wyo.; WLAG, Minneapolis, Minn.; KYT, San Diego, Calif.; KFI, Los Angeles; KHJ, Los Angeles; WWJ, Detroit, Mich.; WJAX, Cleveland, Ohio; KPO, San Francisco, Calif.; KTAM, Cleveland, Ohio; KFAD, Phoenix, Ariz.; KZN, Salt Lake City, Utah; KFAU, Boise City, Idaho; KFKB, Milford, Kan.; WOAI, San Antonio, Texas; WPAM, New York; WLAL, Tulsa, Okla.; PWX, Havana, Cuba; WCBD, Zion, Ill.; WHAS, Louisville, Ky.; WNAD, Norman, Okla. WSB, Atlanta, Ga.; WCAE, Pittsburgh; WBAP, Fort Worth, Texas; KLZ, Denver, Colo.; WLAK, Bellows Falls, Vt.; WSAI, Cincinnati; WLW, Cincinnati; WGR, Buffalo, N. Y.; WMAK, Lockport, N. Y.; WGY, Schenectady, N. Y.; KFDL, Denver, Colo.; CYB, Mexico City, Mexico; CYL, Mexico City, Mexico; CFCN, Calgary, Canada; KGW, Portland, Oregon; KFDA, Baker, Oregon; WHAZ, Troy, N. Y.; KFFQ, Colorado Springs, Colo.; WCM, Austin, Texas; WNAS, Austin, Texas; WNAC, Boston, Mass.; WFAF, Poughkeepsie, N. Y.; KJS, Los Angeles, Calif.



(Wide World)

UNCLE WILBUR ROBINSON, manager of the Brooklyn Dodgers, opens the baseball broadcasting season at the opening game of the National League at the Polo Grounds, New York. The Brooklyn team defeated the Giants 3 to 2. The game was described play by play over station WEAF. "The broadcasting of sports, which proved so successful in the past, is due for a greatly increased popularity," said Uncle Wilbur, who is an ardent radio fan himself. Since he developed "a corporation," he'd rather "receive" WEAF than Reuther.

Programs

(Concluded from page 20)

Station KFAE, Pullman, Wash.

330 Meters (910 Kcys.). P. T. Apr. 25.—8:00 P. M.—"The League of Nations—Its Achievements and Failures," Prof. N. J. Aiken; Agricultural talk; "Treatment of Foul Brood in Bees," B. A. Slocum, apiary specialist; mezzo-contralto solos, Miss Mildred Smalling Donald; cello solos, Vincent Hiden, Rochester; piano numbers; other instrumental selections.

Apr. 28.—8:00 P. M.—"The World Court—What It Will Accomplish," Prof. C. H. Wooddy; "Spring Work on the Farm," Leonard Hegnauer; Agricultural talk; readings, Department of Dramatic Art; songs, Miss Marie Scroggin, Spokane; instrumental solos.

Apr. 30.—8:00 P. M.—"The Outlawry of War," Prof. C. H. Wooddy; "Finding New Facts for Agriculture," Dean E. C. Johnson; "Two Bouquets of Clover," Lincoln R. Lounsbury; instrumental music; vocal solos; piano.

Station WKAQ, San Juan, P. R.

360 Meters (830 Kcys.). E. S. T.—Broadcasts two concerts weekly as follows: Wednesdays, 7 to 9 P. M.; Fridays, 7 to 9 P. M. Announcements are made in Spanish and English.

Station WHAH, Joplin, Mo.

283 Meters (1060 Kcys.. C. S. T.—Tuesday evenings of each week, from 9:00 to 11:00 P. M.—Maurice Jones Dance Orchestra. Thursday evenings of each week, from 9:00 to 11:00 P. M.—Semi-classical music. Sunday evenings of each week from 9:00 to 10:00 P. M.—Radio chapel service.

Station WRAZ, Newark, N. J.

233 Meters (1290 Kcys.). E. S. T.—Broadcasts every evening from 12 midnight until 1:00 A. M.

CRAM'S RADIO MAP IN TWO COLORS—The best map of its kind on the market. Mailed for 35c. The Columbia Print, 1493 Broadway, N. Y. C.

A. B. C.

An Opportunity for You

THE American Broadcast Club, formed under the auspices of RADIO WORLD, has for its object the promotion of the welfare of the broadcast listeners of the United States and Canada.

Membership is open to all interested in radio in any way, either as broadcast listener, dealer, manufacturer, wholesaler or jobber.

A novel feature of the A. B. C. is that membership entails no duties or obligations whatever. There are no dues. All you have to do is enroll. That will signify your interest in radio and make you one of the thousands unselfishly united in a common interest.

All you have to do to join is to send in your name and address on a postcard or in a letter.

Address, A. B. C. Editor, RADIO WORLD, 1493 Broadway, New York City.

El Paso Frowns On White Way As Arcs Cause Interference

EL PASO, TEX.

DECLARING arc lights interfere with wireless messages, radio fans here have induced the city council to postpone calling for bids for lights for the new White Way until tests can be made.

J. T. Burke, president of the El Paso Radio Club, protested that "after an arc light has burned a short time a chattering is produced which throws out a carrier wave."

"One lamp would interrupt radio communication within a radius of four or five blocks and 400 would effect the entire city," he said.

Aeolian Company Enters Radio Field

THE Aeolian Company, New York, has entered the wholesale and retail radio business. The company announces the establishment of a new and complete Radio Department at Aeolian Hall for the distribution of Radio Corporation sets, including the new Super-Heterodyne. They extend a cordial invitation to the public to visit Aeolian Hall on West Forty-second Street and become acquainted with the latest advances made in the development of radio.

Musical Notes Suggested Instead of Call Letters

AS a substitute for the call letters of different broadcasting stations, which are sometimes confusing and unintelligible, the use of musical notes sung by the announcer has been suggested to Secretary of Commerce Hoover.

Dr. Charles M. Swingle, of Cleveland, who recommends this practice as an improved method of designating radio stations, says:

"These notes should be sung by the broadcasters thus: 'Do, me, sol, do, sol, me, do,' might designate WGN. The call of this station in announcements would then be: WGN, do, me, sol, do, sol, me, do," he explains, suggesting that later, only the notes be used.

In his reply the Commissioner of Navigation explained that the Government is forced to follow the rules of the International Bureau at Berne in assigning call letters to radio stations, and numerical designations for amateurs according to their districts.

Delight Beckwith Back on WHN Program

DELIGHT BECKWITH, dramatic and humorous reader, after an absence of several months, was heard from WHN Easter Sunday, between 4:30 and 5:00.

Miss Beckwith is the first artist to give readings with musical accompaniment over the radio, as well as the first to broadcast an entire Shakespearian play. During the war Miss Beckwith was one of the most popular entertainers among the convalescent soldiers. These veterans are among her most appreciative audiences.

Mary Ellis and Friml Heard From WJZ

WJZ presented Mary Ellis, of Arthur Hammerstein's forthcoming "Rose-Marie," and Rudolf Friml, composer, to the American public for the first time through a series of bi-weekly radio recitals. The joint recitals will be given every Tuesday and Saturday evening for a month. Friml will accompany her on the piano.

Hoover Needs More Money as Radio Chief

Appropriations for Inspection, Supervision and Experiments Called Too Low

IF Secretary Hoover is to patrol the ether for fans and commercial and other interests, he may have to make a plea to the Senate Appropriations Committee.

Appropriations for radio inspection, supervision and experimentation for the fiscal year 1924-25, were cut by over $25,000 by the House Appropriation Committee, even after the figures submitted by the Department of Commerce had successfully run the "gauntlet" of the budget.

Secretary Hoover had the approval of the Budget Committee for a total appropriation of $180,278, for radio administration, but this amount was reduced to $158,778 by the House.

The amount allotted is $19,578 over the amount authorized for the current year, but this includes $17,340 as pay for the Naval personnel handling radio accounts, which it is proposed to transfer to Mr. Hoover's department. The only additional money granted for field work, which has increased greatly during the past year, is $2,000 instead of $14,200 asked.

Six extra assistant inspectors and three or four clerks were requested. No allotment for much needed apparatus for inspectors is made, although it is known that field workers have to purchase much of their own equipment.

Latest Patents in Radio Field

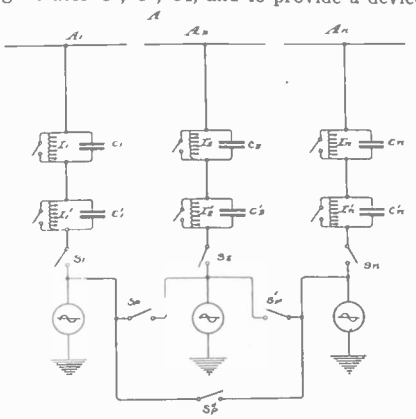
RADIO TRANSMISSION SYSTEM

No. 1,485,111. Patented Feb. 26, 1924. Patentee: Joseph Betherod, Paris, France.

THE object of the present invention is to make improvements in radiotelegraphic stations comprising a plurality of high frequency generators. The purpose of the invention is to effect by very simple operations and at the will of the operator, either the simultaneous operation of these generators at the same frequency so as to apply to the antenna the total power of the generating station, or independently to operate these generators at different frequencies so as to obtain a so-called multiplex transmission.

My invention is illustrated in the single figure of the accompanying drawing below.

The principle of the invention consists in the division of the usually net shaped antenna A, extended in one direction, into several sections A_1, A_2, A_n, each of which is supplied with current by a high frequency generator G_1, G_2, G_n, and to provide a device



for limiting the currents caused by the electromagnetic or electrostatic induction between any two sections.

In this manner, n independent stations will be provided enabling multiplex transmission to the n degree, each station having a wave length slightly different from that of the others. By means of switching means comprising antenna switches S_1, S_2, S_n, and alternator paralleling switches S_p, S'_p, S''_p the operator may at will inter-connect all or a part of the stations, whereby if $n=3$, triplex, or duplex (one transmission having double the power of the other), or simplex transmission is practicable with the total power of the station.

One of the characteristics of the invention resides in the division into n sections of the antenna, in combination with the use of the infinite impedance or so-called frequency traps.

The use of such traps wtih an undivided antenna would not furnish a practical solution of the problem of multiplex transmission because, in order efficaciously to protect each generator against the currents generated by the others, very expensive self-inductances and capacities must be provided to avoid serious losses, i. e. a reduction of the output. This is proved by theory and practice. It may be easily proved that, in case of multiple operation, the partial use of the antenna has no disadvantage.

Did You Get Anniversary Number?

Anniversary Number of Radio World, dated April 5. A few copies left. Larger than usual. Special features. 15 cents per copy. Mailed on receipt of price, or start your subscription with that number. Radio World, $6.00 per year (52 nos.), $3.00 six months, $1.50 three months. Radio World, 1493 Broadway, N. Y. C.

Convict Studies While In Jail

The following letter was received the other day:

EDITOR, RADIO WORLD:

Last year, I completed a course in salesmanship with the International Correspondence Schools of Scranton, Pa., receiving their diploma. President Ralph E. Weeks wrote me a letter stating that he would extend to me a free scholarship in any other course of the I. C. S. as a reward for my having maintained an average of better than 98% throughout the salesmanship course.

Two weeks ago, I took him up on that offer, and am now preparing my first lesson in a course in radio. Surely you can realize how valuable your RADIO WORLD would be to me in conjunction with my course. I cannot pay for a subscription as I am in prison and have been ever since 1914, a decade ago. My idea is to do my level best to become well versed in radio in all its angles, and get into the selling end of the radio game when I leave here early in 1926. May I not ask you to please make it possible for me to receive your RADIO WORLD regularly? You know I'll appreciate such a privilege.

Perhaps my chief difficulty in the radio course will be the working out of the theories without the aid of the various parts which go into the many hook-ups. The technical knowledge may be advantageous but it seems to me a fellow must have practical knowledge as well. Who knows, perhaps I may be able to secure some used sockets, condensers, rheostats, variocouplers, etc., later on.

The writer's request was quickly granted. Any one desiring to send him any parts or equipment, so he can overcome his chief difficulty in learning radio, should write to the editor, and the prisoner's name and address will be furnished.

"I'M MARRIED!"

(A. J. N. Announcing)

MILTON J. CROSS, better known to hundreds of thousands of radio listeners throughout the country as AJN, one of the announcers of stations WJZ and WJY, New York, was married the other afternoon, then hurried to WJY to introduce the broadcast artists, as if nothing had happened.

The wedding, which took place in Old St. Paul's Church, marks a milestone in a romance which was started three years ago when Lillian Ellegood Fowler, at that time the assistant to Dr. John Carl, organmaster of the Old First Presbyterian Church, met Cross, who was visiting soloist at that church. The first meeting occurred almost three years to a day before the wedding, for Mr. Cross sang at the First Church during the Easter Week services in 1921 and met Miss Fowler during that week.

Mr. Cross has been a familiar voice to the radio fans since the fall of 1922, when he made his debut as an announcer from station WJZ, Newark, New Jersey. When WJZ moved to its present home in the Aeolian Building, New York City, Cross was heard from both station WJZ and its twin station WJY. He is a singer of considerable reputation in church work in Manhattan and Brooklyn, and once a week he sings over the radio during the Estey Organ Recitals, announcing himself as "your announcer AJN."

The engagement had been a secret since Christmas from even Mr. Cross's associates.

Mr. and Mrs. Cross have decided to defer the honeymoon until late summer. The couple have taken an apartment in Brooklyn.

COMPLETE LIST—Of Radio Stations in the United States, Canada, Cuba, Porto Rico and Mexico appeared in RADIO WORLD dated April 5, 1924, and was corrected up to the date of going to press. 15c per copy, or begin your subscription with that number. RADIO WORLD 1493 BROADWAY, NEW YORK CITY.

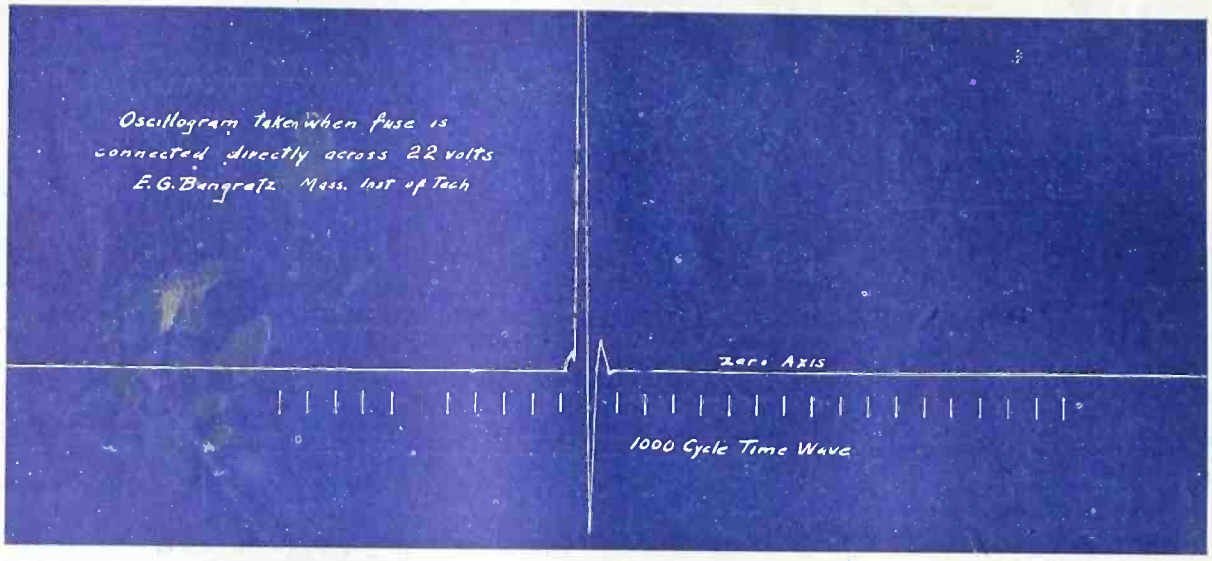
New Parliament Member a Well Known Amateur

LONDON—Otho W. Nicholson, the recently elected M. P. for the Abbey division of Westminster, is well-known in amateur wireless circles. He gained experience as an amateur prior to 1914 and during the war acted as wireless officer in an important capacity.

Since the war he has continued his interest in the subject. He is a keen transmitter and a member of the Transmitter and Relay Section of the Radio Society of Great Britain. He is probably the only British amateur who has a super heterodyne which is an exact replica of the set used by Paul Godley.

RADECO SAFETY FUSES

THE FASTEST ACTING FUSES IN THE WORLD

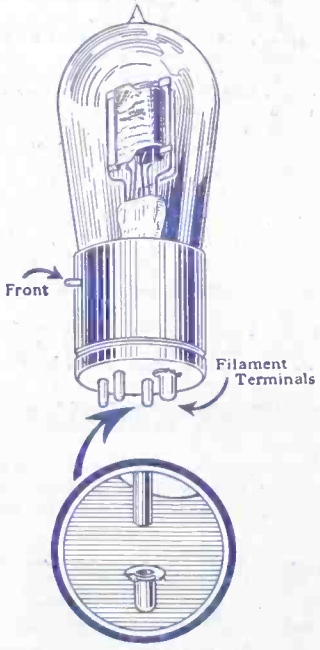


This Oscillogram made at

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Proves that the Radeco Safety Fuse acts in less than

1/10th of 1/1000th of a Second!



RADECO SAFETY FUSES slipped on the filament terminals of your tubes will absolutely protect them against blowing out.

WARNING:— The only point where tubes can be positively protected against all causes of blowout is at the filament terminal. Protectors which are installed in the "B" Battery circuit can only protect against "B" Battery voltage and are apt to reduce the range and volume of the Receiving Set by offering resistance to the normal flow of "B" Battery current.

INSIST ON RADECO SAFETY FUSES—the only fuses which protect tubes from all causes of blowouts without interfering with the efficiency of the Receiving Set.

FOR 3 YEARS RADECO SAFETY FUSES HAVE served thousands of users and have been highly endorsed by radio experts.

Such popularity must be deserved

Priced at 50c per fuse

ONE FUSE ONLY IS NEEDED PER TUBE.
STATE TYPE OF TUBE WHEN ORDERING.

DEALERS, JOBBERS—Supply the demand for RADECO FUSES. Send today for an attractive display carton containing 24 fuses at your regular trade discounts.

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