

A UV199 OUTFIT COMPLETE FOR \$20 (See Inside)

15c. a Copy

September 1
1923,

\$6.00 a Year

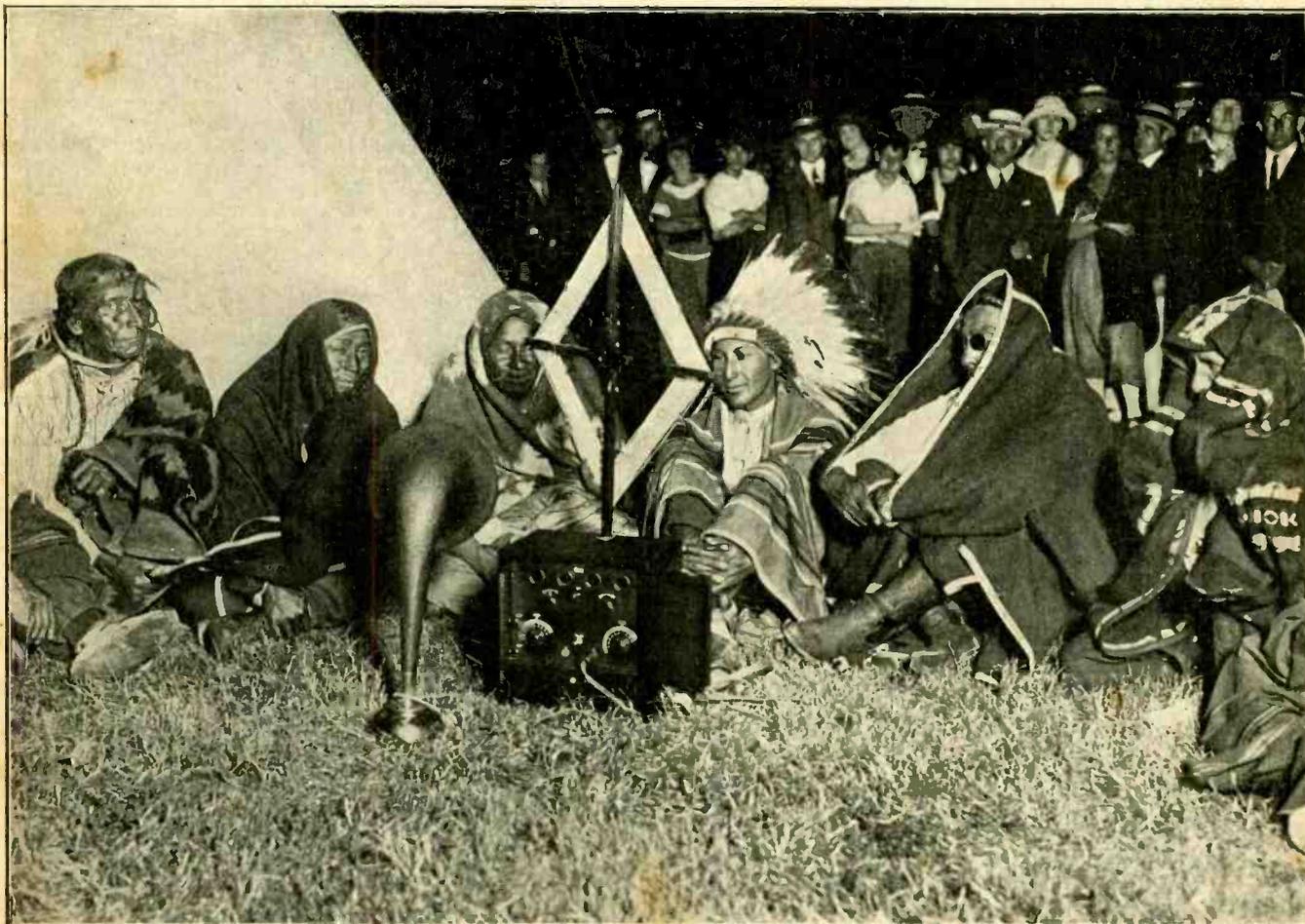
RADIO WORLD

Title Reg. U. S. Pat Off.

ILLUSTRATED

EVERY WEEK

SOME ORIGINAL AMERICANS ENJOY A BROADCAST PROGRAM



(C. Kadel and Herbert)

Twenty-seven Arapahoe Indian braves and squaws, not to mention papooses, who arrived in New York from the Wind River Reservation, Wyoming, en route to England, were entertained by a loop receiver. They gathered around it like they used to gather around the old camp fires and listened to the programs, making comment much the same as any radio wise man and woman of today will do. Those in the illustration are Mr. and Mrs. Red Turtle, Setting Eagle, White Bull and Red Fox. They enjoyed the concerts and solos much more than the talks on politics and current topics.

NEWSDEALERS, ATTENTION! SEE PAGE 22

VACUUM TUBES REPAIRED

WD11—WD12—UV201A—UV199—and others for

— \$3.00 —

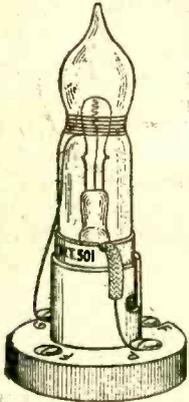
Quick service—All tubes repaired by us guaranteed to work as good as new. Send your dead tubes—we prepay parcel post to you. All you pay is \$3.00 to postman. We give 48-hour service.

Thomas Brown Co.

511-517 Orange St. Newark, N. J.

Write Plainly

HAVE YOU TRIED THE WELSH PEANUT TUBE?



If you want to eliminate distortion and get really clear reception, try the Welsh Peanut Tube. Filament 4 to 6 V. Plate 16 1/2 to 32 V. Amps about .25.

Price \$2.00

Special Sockets...40c
Adaptors75c

Sent postpaid on receipt of amount if your dealer has not stocked them.

Welsh Electric Lamp Corp.

69 Boylan Street
Newark, N. J.

The original manufactured only by the Welsh Electric Lamp Corp.

BWARE OF IMITATIONS

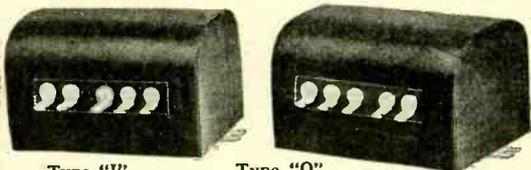
PATENTS

promptly procured. Trade Marks designed & registered. **FREE INVENTION RECORDING BLANK** Phone Vanderbilt 7212

FREE MANUFACTURERS PATENT CO. INC.
BOOK 520 FIFTH AVE. NEW YORK

COMO DUPLEX TRANSFORMERS

The COMO DUPLEX SYSTEM of audio-frequency amplification gives the maximum volume without distortion and tube noise.



COMO APPARATUS COMPANY
446 TREMONT STREET BOSTON, MASS.

There is a combined filtering action which assures perfect results when ordinary amplification fails.

It can be added to your present amplifier, giving you power amplification on the weak signals that more of the ordinary amplification would kill.

Sold only in matched Pairs, \$12.50

A copy of C. White's "HOW TO MAKE A POWER AMPLIFIER" is yours for the asking.

Station WHAZ to Celebrate Its First Anniversary

RADIOPHONE STATION WHAZ at the Rensselaer Polytechnic Institute, Troy, N. Y., the oldest engineering college in America, will celebrate its first anniversary Monday evening, September 10, with a program by the same group which presented the first program when this station was opened a year ago. Dr. Palmer C. Ricketts, President of the Institute, will deliver a brief address.

Station WHAZ has already performed many unique feats. Installed through a gift of \$30,000 by the Roebings, graduates of the Institute, famous as the builders of the Brooklyn Bridge, this station was primarily intended for use in connection with the electrical engineering course at the Rensselaer Polytechnic Institute and for wireless experimental purposes, which are regularly carried out with many interesting scientific developments. It was decided to devote it one evening each week (Mondays only) to the entertainment of the radio audience, and during the cooler season its programs, which run the whole gamut of entertainment and instruction, are heard regularly from coast to coast, from Alaska to Panama, in Hawaii, Cuba and at sea.

WHAZ was one of the first stations in America heard in continental Europe last November. It was the first eastern station heard in Hawaii last December. This station established the long distance record of the world in February, when test early morning programs were picked up on four days at Invercargill, New Zealand, a distance of 10,000 miles from Troy, further than the human voice had ever been carried before without wires. It accomplished the first transcontinental two-way radiophone transmissions in January and February with station

CFCN at Calgary, Alberta, Canada, with programs and messages interchanged simultaneously. A new summer distance record was made in June when a midnight concert by Doring's Band and soprano solos by Mrs. William T. Lawrence were clearly heard in complete form at Hollywood, California. Even during the periods of greatest static interference reports show that its programs are heard with remarkable clearness as far west as the Rockies, south to the Carolinas and throughout the Eastern Canadian Provinces.

In physical equipment station WHAZ is very similar to several other large stations throughout the country, operating a 500-watt Western Electric broadcasting equipment, though its location on top of the big Sage Laboratory on the crest of the hill-top campus above the city is an ideal one. Its remarkable success, however, is credited to the superior technical skill of the electrical engineering experts in charge of the operation of the station, all three of whom were pioneers in the wireless operating field and have constructed, tested and operated all manner of wireless sending and receiving apparatus. Prof. Wynant J. Williams is the engineer in charge with two instructors of the Electrical Engineering Department of the Institute, Harry R. Mimno and Leonard J. Inskip, as assistants. Rutherford Hayner is the program director and announcer.

Another "Farmer Program" from WGY

SO many requests have been received by WGY, the General Electric Company's Schenectady, N. Y., broadcasting station, for another "Farmer Program," that the studio management has arranged such a program for Thursday night, September 6. It is a novelty program, an evening in the country on the occasion of a fiftieth wedding anniversary. The Cornhuskers Orchestra will play and the Cowbell Four will sing. W. W. Norton, of Hartford, N. Y., will have a special message for the farmer and the city dweller in his talk on "The Class Conscious Farmer and Co-operation."

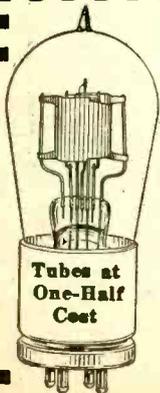
Sunday morning, September 2, WGY will broadcast the service of the First English Lutheran Church. The sermon will be delivered by the Rev. Herbert D. Shimer. WGY will not be in the air Monday afternoon, but at 7:40 p. m. baseball results will be announced and a concert program will be broadcast as usual at 7:45 o'clock. This program will mark the return of the WGY Orchestra for the season.

"Peg o' My Heart" will be presented Tuesday night by the WGY Student Players. The music, between the acts, will be provided by the WGY Orchestra.

At an early program Friday night a semi-classical program will be offered by Ernest Griffiths, tenor; Fred Grazaide, violinist, and John Finke, pianist. The 10:30 p. m. program of Friday will be made up of English compositions.

The Radio Dealer Year Book Will Appear October 1

THE Radio Dealer, 1133 Broadway, New York City, announces that it has in course of preparation the Radio Dealer Year Book which will contain information of vital interest to the radio business man. This will include classified lists of manufacturers, list prices and trade names, a directory of radio trade-marks and a jobber's directory. The book will be published about October 1.



Tubes at One-Half Cost

IT HAS HAPPENED TO ALL OF YOU IN A FRACTION OF A SECOND!

WHEN the filament burns out, at least \$5.00 goes with it to put the set in operation again.

WHY not save nearly one-half the cost of a new tube by sending us your burned out or broken tube to be repaired?

WE REPAIR EVERY TYPE OF tungsten wire filament receiving tube. All our tubes are TESTED and GUARANTEED to function as well as when new.

All tubes returned P. P., C. O. D.

HARVARD RADIO LABORATORIES
BOSTON P. O. BOX 1781 MASS.

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]

A Weekly Journal, Published Every Wednesday and Dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y. Telephone: Bryant 4796.

Vol. III, No. 23. Whole No. 75

September 1, 1923

15c. per copy, \$6.00 a year

A UV199 Outfit Complete for \$20

By C. White, Consulting Engineer

RADIO supplies are getting cheaper and better day by day and in every way. There is hardly any conceivable reason my every one should not have a radio set in his home and enjoy the many benefits to be derived from it. A year or so ago there were many obstacles in the road to the man who wished a radio set without any trouble or maintenance. It was next to impossible at that time to obtain a dry cell tube, and a storage "A" battery was the only economical thing to use. This meant not only the purchasing of a storage battery which in itself is quite an item of expense but also the trouble to keep the battery charged and in good electrical condition. Since last year a new tube has been developed and it is this new tube called UV-199 or C299 that has made it wholly possible to build a high grade outfit without worrying about a storage battery or rectifier to charge it.

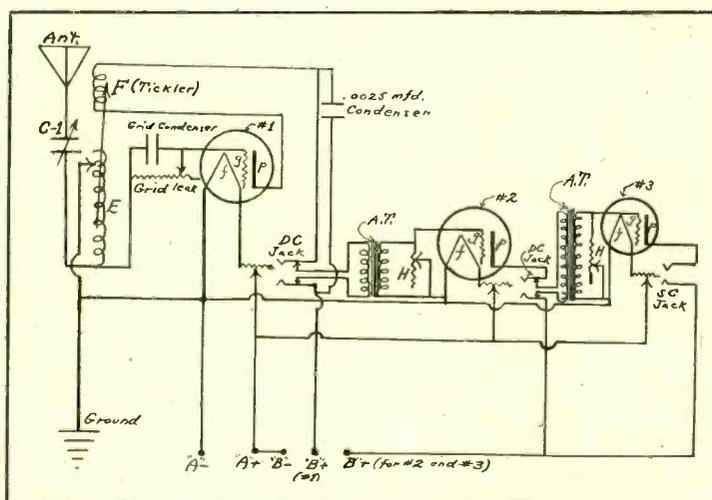
With these new conditions in sight I have been asked by many to design a reliable tuner that would operate a loud speaker on local or strong signals. The result is the old reliable single circuit regenerative receiver with

a few improvements in the amplifier circuit. While I must admit that such a circuit is not the best, it does represent a good circuit for the amateur who wants a complete outfit that will work without playing around with too many adjustments. It is not only simple but fool-proof to the highest degree. Trouble can be easily located and remedied by the man who builds it, and with care in operation you are sure to pull in distant stations with clarity and volume.

The coupler E-F as used in this circuit is not the molded type or the 180 degree type but the simple tubular type with the rotor mounted at one end of the tube. Such a coupler is less expensive than the other styles and can be used to good advantage in this circuit, although if it is so desired the molded or the 180 degree type can be employed instead. The tubular style of coupler generally has the small, or few number of turns,

taps at the upper part of the tube, which is at the end of the tube nearest the rotor. Therefore by connecting up the coupler as indicated in the schematic diagram you can make use of this fact to slightly vary the tickler coupling in order to try different amounts of regeneration. It is plain to see that if the stator connections were reversed the inductance taps would be at the far end of the tube from the rotor and would only have a slight effect upon the rotor or regenerative adjustment. But care must be exercised to see that there

are at least 40 turns of wire on the rotor to insure regeneration at all wave length ranges of the tuning circuit. Another feature of the set is the use of a leak resistance across the secondary of the amplifying transformers A. T. This resistance (H) is of the pencil grid leak with a variable resistance from 1,000 to 100,000 ohms, which can be readily purchased from any radio dealer handling variable leaks of the pencil style. The audio-frequency amplifying transformers will operate very much quieter with a variable impedance of the amplifier circuit is fixed at a



A single circuit diagram using the UV199 or C299 tube. Note the variable high resistance leaks across the secondaries of the two amplifying transformers. These assure quiet operation and less distortion.

definite value and is not allowed to vary according to the insulation resistance and the leakage of the wiring. It is true that volume will drop just a little but the sacrifice is well worth the gain in quality and clarity of the music and voice signal.

The jacks on the detector (No. 1) and the first stage (No. 2) are marked with the letters DC which means that they are double circuit jacks, while the jacks on the last stage (No. 3) is marked SC for single circuit or, as often called, open circuit jack. The convenience in operation afforded by the use of jacks is well worth the time and expense to install them. There is another feature I wish to call to your attention and that is the fact that the grid return from the detector tube (No. 1) is attached to the negative side of the filament. This is just the opposite to the instructions given with each

(Concluded on next page)

Geological Survey Takes Radio Set Into the Grand Canyon

By Carl H. Butman

EQUIPPED with a special radio receiving set, a party of ten explorers from the Geological Survey left Lees Ferry in Northern Arizona on August 1, for a three hundred-mile trip down the Colorado to the mouth of the Virgin River at Rioville, Nevada.

Unfortunately these modern surveyors, who are following the route first explored by Major Powell fifty-four years ago, were unable to carry a radio transmitting set due to weight and space. But they are carrying a modern receiving set and will be able to hear what is going on in the world during the next three months, although they will be unable to return daily their adventures in mapping this stretch of the Colorado. Arrangements have been made, however, with the radio stations of the *Deseret News* of Salt Lake City and the *Los Angeles Times* to broadcast bulletins sent from trail crossings. The dispatches will be relayed by runners and telephone or telegraph when the party gets far enough down the Colorado to reach the regular lines of communication. In this manner the world will be advised of the progress of the exploration in the Canyon and passage of the four boats through some of the wildest rapids in the country.

The special radio set was re-constructed by Mr. R. L. Atkinson of the Survey, from a standard Westinghouse regenerative set, adapted to two stages of amplification with new tubes. The whole outfit, including the batteries, is packed in a water-proof, wooden box with sponge rubber to keep it from jarring during the long

boat trip. An especially constructed antenna on a reel, capable of being erected at camp sites on the banks of the river, can be strung from short poles or from projecting rocks to a length of 150 feet.

A preliminary radio test at Lees Ferry has already been made, and it is reported that the explorers received broadcasts from Los Angeles, 430 miles away, without difficulty at night. The real reception test Col. C. H. Birdseye, who is in charge of the party, believes will come when they are in the lowest part of the Canyon, estimated as a mile deep, near El Tovar, where dead spots and static may be encountered.

Besides the geological and topographical results achieved, the trip will also prove of material interest in the development of radio communication, along with experiments undertaken by the Bureau of Mines, and other governmental bureaus, to see how far radio will carry into the "bowels of the earth."

Cheap—But Not Tinny

MANY fans want a loud talker but can't afford one, and therefore they use tin horns with loud speaking unit phones. If you get a megaphone, the fibre kind that the cheer leaders use, and put it over the phone, you will be surprised at the clearness and lack of tinny sound. And furthermore it works fine.

(Concluded from preceding page)

tube, but I have found that better results are obtained when the return is made to the negative side instead of the positive side of the "A" battery. If you wish to find out for yourself you can easily transfer the connection on the detector grid return to the positive side which is shown in dotted lines on the diagram. Be sure to purchase a 30 ohm rheostat for each tube. A 6 ohms rheostat will not work with the new tubes since it does not afford ample control of the filament current. The tube sockets should be mounted on thick felt and the wire connecting directly to the sockets should be flexible in order to cut down microphonic hum from mechanical vibrations and jars. Complete shielding of the panel is not necessary, but it will be of advantage to place a small circular shaped piece of copper foil, which is connected to the ground, on the front side of the condenser C-1. C-1 is a 23 plate variable condenser with a vernier attachment of some sort. In connecting this condenser in the circuit be sure to see to it that the movable plates of the same are connected to the Ant. terminal of the set so as to avoid placing grid potential on the shaft of the condenser which might cause howling while tuning in. All joints should be well cleaned and soldered. Avoid using too much solder and splattering the solder and the soldering flux on the panel and other parts of the set where it is not needed. You have no idea how much howling solder flux on the panel and just how much trouble a small lump of solder in the wrong place can cause. The outfit is a most reliable and fool-proof set and the only test that will be required before it can be operated is the regenerative test. If the tube (No. 1) refuses to oscillate as the

coupling between the tickler and E is increased then it is advisable to try the following suggestions: If you are using a 180 degree coupler reverse the terminal connections to the rotor. When an ordinary 90 degree coupler is used this is not necessary since the coupler can be turned completely around on its axis as a general rule. Adjust your grid leak resistance, perhaps you have not the correct value for the tube used. Try varying the filament current but under no circumstances place more than three dry cells on for "A" battery to light the filament. Next raise your "B" battery voltage until the tube oscillates. If all of these fail try another tube in the detector socket, sometimes one tube will act better as a detector than the others although they belong to the same type. When tuning in place the rotor almost vertical with respect to the stator, adjust C-1 and the taps on E until the faint trace of a signal is heard. Then increase the coupling of the tickler by slowly turning the tickler (rotor) in the direction that increases the volume and at the same time slightly altering the setting of C-1 to compensate for the changes in the circuit constants due to the movement of the tickler. When you reach a point where the music or voice grows very rough or hollow, then you have too much regeneration and it is better to turn your filament down a little or take back on the coupling. If the regenerative point is over-stepped the tube will oscillate, which condition is noted by a click in the phones followed by a rushing sound like the escaping of steam. Try to tune in without creating this condition. The parts for this set complete, without tubes and batteries, will cost from \$20 to \$30 depending on the quality.

A Simple Radiophone for Local Work

By Carl Masson

ANOTHER big radio season is before us; in fact, judging from the preparations which manufacturers are making, this coming season will by far outclass all previous ones. What is more, thousands of radio fans who had heretofore been termed as "broadcast listeners" are swiftly becoming radio amateurs.

What is still more, many amateurs, who have mastered the art of producing sounds from ether waves, will want to generate waves of their own. In other words, hundreds of radio stations will install equipment to "talk" in addition to receiving sets, and the radio inspectors will have to issue many new licenses.

With these predictions in mind, the author presents herewith a radiophone transmitting outfit of unusual simplicity, and costing very little to make.

The days of the spark coil sets ("squeak boxes") are gone forever, and C W affords wondrous opportunities for the amateur to smash all records.

The accompanying illustration, which appears to be

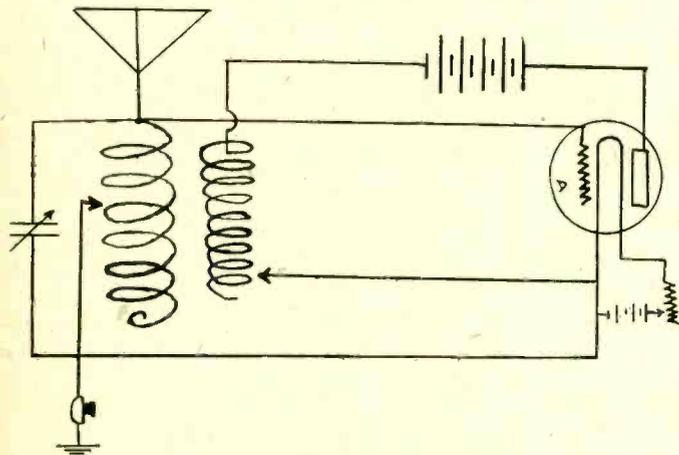


Fig. 1. Circuit diagram for a simple home-made radiophone.

a receiving set, shows the layout of the parts comprising this outfit. The loose coupler is a medium-sized one, the variable condenser is .001 in capacity, and is preferably an enclosed one. A standard V. T. socket, an ordinary filament rheostat and binding posts as marked, plus the microphone, tube, and batteries, are the few parts required. All parts are mounted on a woden base as shown in the illustration.

The tube used is one of the hard amplifying type. The "A" battery is the regular six volts. Four "B" batteries connected in series supply the plate voltage.

An antenna of the "T" type will give the best results for transmitting. Tuning is accomplished with the loose coupler and the variable condenser. Rough adjustments are made with the coupler and fine tuning is done with the variable condenser.

Though the transmitting distance of this outfit is limited, it is ideal for the beginner. The diagram shows how the instruments are hooked up, which, I am sure, is self-explanatory, being so simple.

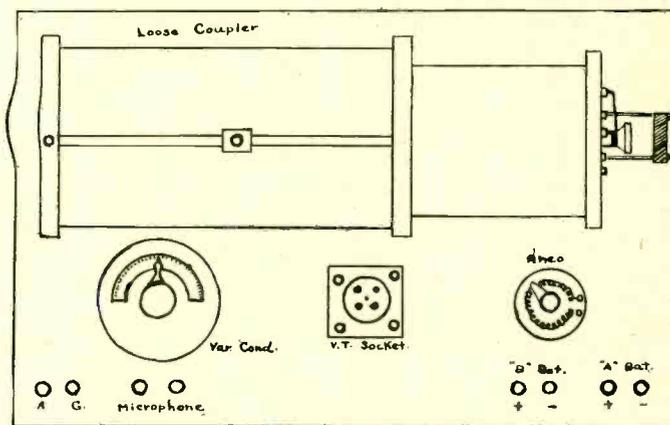


Fig. 2. Suggested location of apparatus on baseboard.

500 Miles on an Indoor Aerial

By Arthur G. Shirt

MANY radio enthusiasts who find it impossible to rig up an outdoor antenna have given up the idea of owning a radio receiver for themselves because they doubt the efficacy of an indoor aerial. The average loop aerial, of course, is almost out of the question for the radio novice, because its use demands very sensitive receiving apparatus of a make and cost far in advance of the humble desires of the average owner. With a single tube set, a loop is a very critical aerial, and can be successfully operated only with a few special hook-ups and then with more than ordinary skill and care. But with an indoor aerial of the type described below, all these disadvantages are done away with, and concerts come through with the clearness and volume of an outside aerial.

Many amateurs use the lighting circuits of their homes as radio antenna. However, it is not necessary to use a condenser plug, as recommended by most users of the lighting circuit antenna, if you take the radio impulses from the circuit by inductance. Running from the aerial binding post on the panel, use an ordi-

nary piece of lamp cord—that is, two pieces of insulated wire twisted together. One wire is connected to the inside connection of the light socket, the other end of the same wire being taped very securely to prevent a contact with the set. The other wire connects to the aerial binding post, and the unused end of this wire is also taped to prevent contact with the light socket. With this arrangement, there is no direct connection of the set with either of the two wires of the lighting circuit, yet the device works, and it works well. The originator of this system says that his set is almost noiseless and that stations which before came in weak now come in loud and clear.

The current is always turned on while the set is in operation, but, of course, there is no consumption of current. The average working range of a single tube regenerative outfit, using the lighting circuit as suggested above, is 500 miles. There is no danger in this novel arrangement, either to the lighting system of the house or to the radiophone receiving set.

Direct Radio Service to United States from Holland and Italy

By J. L. Bernard

FOR the first time in the history of international communications, direct radio telegraphic service between the United States and the Hague, Holland, and between the United States and Caltano, Italy, was established last week according to an announcement made by the Radio Corporation of America. The opening of these services raises the total number of direct radio circuits radiating to European countries from New York City from six to eight circuits and affects not only Holland and Italy but provides more direct routes between the adjoining countries and the United States.

The addition of these new circuits to the already existing channels of radio communication to many parts of the world materially advances the status of plans which are now being worked out by the Radio Corporation to make the United States the centre of a world-wide radio communication network. Because of the centralized location of the United States, with Europe to the east, South America to the south and the Orient to the west, this country enjoys a natural advantage which helps to make it possible to link the principal nations of the world by radio around New York as the pivotal centre. This plan is rapidly nearing completion, there being at present eight connections across the Atlantic and one bridging the Pacific.

The circuit to Italy is one of the longest in existence. The distance which the radio waves travel in connecting the two points in communication is over 4,500 miles, or one-sixth of the way around the globe. In bridging this distance, however, the element of time is a negligible factor, it requiring but one-fortieth of a second for the signal flashed in New York to reach Italy. The distance traveled by radio waves between the United States and Holland is 3,500 miles.

The Italian Government has for many years expressed a desire to have direct radio service with the United States. Not only will it be highly beneficial to that country, but Italy will now be in a position to render an effective service to neighboring countries by placing the use of her radio station at the disposal of Sicily, Hungary, Servia, Greece and other neighboring countries and thus provide more rapid and direct contact between these countries and the United States. The more intimate relationship created by

the new radio service will greatly enhance the trade interests between all the countries affected.

The geographical location of Holland with respect to Belgium, Finland and Denmark gives to Holland a similar advantageous position whereby she may handle communications to and from these countries with maximum dispatch. Thus these two new radio stations provide an outlet for business and social traffic between many European countries and the United States, according to this nation a unique and powerful position of commercial and political prestige in the affairs of foreign nations.

In commenting upon the new service General Harbord, president of the company, said: "Direct communication between the United States and Holland and between the United States and Italy has long been the dream of our friends across the sea. The opening of this remarkable service will link in a more perfect bond the business and social friendship of these peoples and will assist in bringing about the stabilization of trade conditions which depends so largely upon swift, reliable and direct communication. This achievement is a monument to the skill of the Holland and Italian Government engineers with whom our engineers have been closely co-operating for several months in an endeavor to perfect methods for annihilating space and time in the exchange of intelligence."

The transmitting station which engages in communication with the two stations abroad is situated at Rocky Point, Long Island, 70 miles from New York City. The antenna system of this central station is so large that a plot of 6,400 acres was required on which to erect the towers. A system of private telegraph lines joins the control apparatus of this station with the operators at the Broad Street offices of the Radio Corporation where the actual telegraphing is performed. The receiving station is located at Riverhead, seven miles east of Rocky Point, and in a similar manner the receiving operator at Broad Street receives the signals intercepted at Riverhead and transcribes the dots and dashes as they are received by him. This system of remote control of high power radio circuits is a strictly American innovation which obviates all the disadvantages of stations located in a city where various atmospheric disturbances seriously interfere with its efficient operation.

Reward for Message from Captain MacMillan

RADIO WORLD has received the following telegram from WJAZ, the Zenith Edgewater Beach Hotel Broadcasting Station, Chicago:

"MacMillan expedition has not been heard from since July 27. Many are worried, but we do not think it strange, as his ship, 'Bowdoin,' is not only in continuous daylight but is inside auroral band. He will have no darkness until September. Reception is difficult for

him under these conditions from low-powered transmitter necessitated by the limited space on his ship.

"However, we will present gratis to the first Canadian or American amateur to deliver to us the next message from Captain MacMillan a complete Zenith standard receiver and amplifier, a duplicate of the MacMillan set. This is done to electrify interest generally."

Don't Do It Half Way!

WHEN constructing a set you will probably carefully solder all connections, and then neglect to solder your antenna wire connections and ground connection. The energy picked up by the antenna is so extremely small that it is a waste

of good work to put up a fine 100 or 150 foot antenna and then neglect to get even a quarter of the actual energy out of it by not soldering each and every wire, or else hand splicing them like rope. Don't do it only half way—go the entire route.

Fighting Forest Fires with Airplanes and Radio

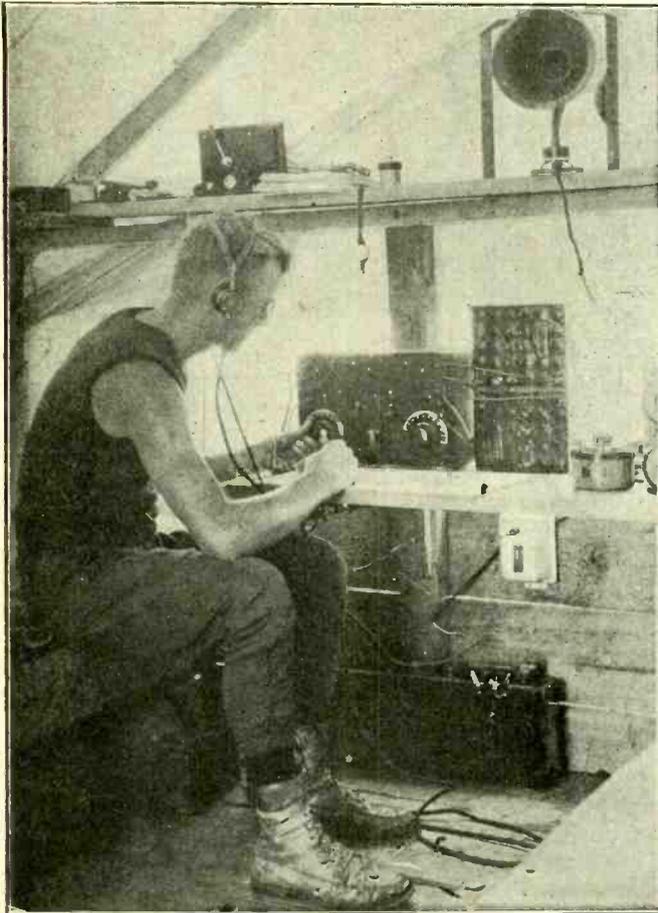
By Campbell MacDougall

PROBABLY the most serious business in the Canadian wilds and forests is the fighting of forest fires. Canada employs a picked staff of men to watch out for fires in their great uncharted wilderness and fight them. Were these men not on duty, forest fires, due to lightning and camp fires left burning or smoldering, would devastate the vast forests of Canada in no time. A person who has never seen a forest fire cannot imagine the peril of it. It sweeps forward under a breeze like the hand of death destroying everything before it.

is derived from a wind driven generator located on the wings of the plane.

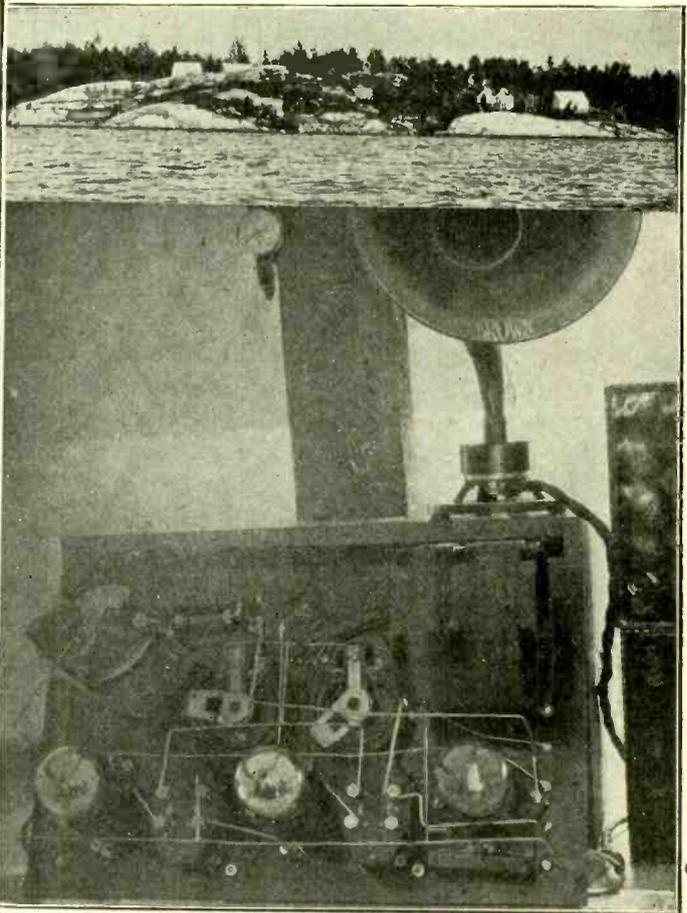
William Robinson, who is responsible for the planes and rangers' offices being equipped with radio, is the chief radio engineer of the Laurentide Air Service. The sets were made by him and were specially constructed with a view of the service to which they would be put.

The method of fighting these fires is novel in itself, inasmuch as the planes themselves and their pilots cannot land in the heavily wooded sections. They call the home station on a wave length of from 550 meters



(C. Paul Thompson)

William Robinson and his receiving station on Ramsay Lake, Ontario, listening in for fire alarms. Receiving set designed and used by Robinson, and, above, the location of the station.



In order to cope with this terror, the Canadian Government has equipped her fire fighters with airplanes. These scout around, spot the fire and report it to headquarters at Ramsay Lake, Ontario. Up to a short time ago, the planes relied upon their speed coupled with manual signaling devices to advise headquarters. They would spot the fire, take the location and then fly post haste back to the station.

As an experiment they tried installing radio sending and receiving sets on the planes and at the station. The planes are of the SE type, and as yet not all of them are equipped with radio. The receiving and transmitting sets are located in the forward cockpit of the plane, and the antenna is of the hanging type used in most planes. Current for the operation of the sets

to 900, advise it of the location of the blaze according to a map and then hurry off after getting an answer.

Then the rangers, who are scattered throughout the woods many miles from the station and may be hundreds of miles from the fire are called by line phone and start for the location of the fire.

Mr. Robinson's set is a regenerative receiver, consisting of detector with two stages of audio-frequency amplification. Because of the fact that the particular locality is a "static hole" it is impossible to use any additional amplification.

Besides being of value as a fire fighter, radio also relieves the terrible loneliness for the rangers. They beguile their dull nights by listening into the local and distant broadcasting stations, while waiting for their radio call to duty.

Swallows Interfere with Broadcasting

By Washington R. Service

EVEN the birds in Washington, D. C., are radio fans, and their insistence upon attending broadcasting events is causing some of the local stations considerable embarrassment.

Engineers of the Chesapeake & Potomac Telephone Co., broadcasting station WCAP, found themselves in difficulties during the broadcasting of the dinner given to Paul Whiteman in New York, received there by land wire from WEAJ, because of the antics of swallows which had settled upon the station's antenna.

Shortly after the program began the wave length of the station suddenly increased from 469 to 479 meters, the vacuum tubes in the transmitter began to heat up and the plate current increased tremendously. In order to save the tubes it was necessary to reduce the plate voltage from 1,600 to 1,450 volts, but even after this reduction was made the plate current was 850 milliamperes instead of the normal 700 milliamperes.

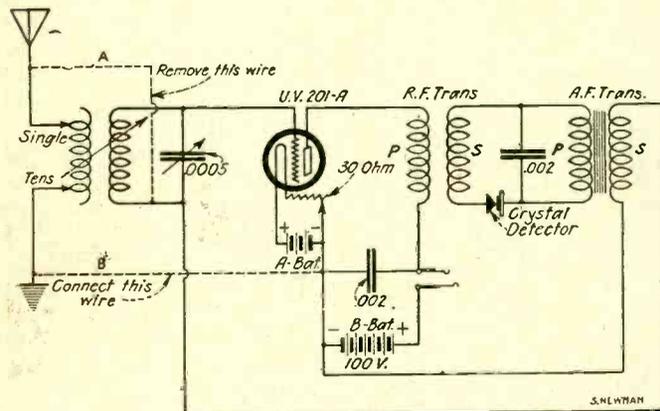
Emergency apparatus was placed in readiness for immediate use, as the engineers scurried around seeking the cause of the trouble. One of the men went out to look the antenna over, and almost fainted to see a flock of swallows calmly roosted on the wires. The lead-in wire was shaken sufficiently to cause the unwelcome radio fans to seek some other resting place for the night, and conditions in the operating room returned to normal.

The experience is believed to be new in the history of radio broadcasting. Engineers of Station WCAP explain that the size of the antenna was increased by the size of the birds' bodies, thus increasing the wave length and causing a greater current to flow. They deny, however, that the birds were attracted to the antenna for a feast of mythical "wire worms" or that they are in the market for a radio scarecrow. Inventors are said to be intrigued by the possibilities of the case.

Curing Induction in a Reflex Set

By Earl A. Wright

AFTER having constructed an Erla reflex circuit, as invented by the Electrical Research Laboratories, I found it to be the best little one tube set I had ever tried. The tone and volume was equal to two tubes, but the circuit was very noisy, due to the



Easy method of curing induction in a reflex set.

electric light wires. This caused a very disagreeable hum in the phones, and it was loud enough to hear all over the room.

I tried to rid my set of this noise by moving it to different parts of the house. The noise always pursued me. Then I opened the light switch outside, and the

hum stopped and everything became as clear as a bell. This showed my set to be picking up the A. C. induction from the wires in the house. The closest wires were about 20 feet from my set.

I had been watching the question and answer department of all the radio magazines I could get, thinking I could find the answer to my trouble. Many times I ran across the question "How can I stop the hum in my reflex set?" and the answer was, "Run your aerial at right angles with the power wires." This, of course, would help if the aerial happened to be close, and running parallel with the wires. But it didn't answer much for me. Grounding the negative side of the A battery will stop the hum in ordinary circuits, but grounding the A battery in this particular reflex circuit would unbalance the whole thing.

Finally I stumbled across a way to stop it. It was so simple and easy, and worked so well, I thought there must be many reflex fans throughout the country who would be glad to try it, so I am giving the little secret to RADIO WORLD. Of course, I do not know how it will work on other reflex circuits besides the Erla. But I think it will be about the same.

It is only necessary to change the circuit slightly, as shown in the diagram. Remove wire "A" and connect wire "B" in the circuit. That's all there is to it. The set will now be very quiet, and everything coming in will be as clear as a bell. This circuit, if properly adjusted, will operate a loud speaker.

Radio a Boon to Alaskan Light Keepers

RADIOPHONE communication between light stations in isolated territory has been found very successful by the Lighthouse Service, according to reports to the Department of Commerce. Complete stations were installed at Cape Sarichef and Scotch Cap Light Stations, Alaska, in 1921, and after overcoming some difficulties of operation during the first year, due to burnouts of the motor-generator and wrecking of one of the steel antenna masts by a storm, communication between the stations has continued un-

interruptedly for the past year, which has been mild.

The two stations are about 17 miles apart. Keepers at both stations have mastered the code, so as to be able to exchange messages with mail steamers, and have been able to communicate for a distance of 65 miles by voice and 165 miles in code. The telephone installation at these stations consists of a type C. W. 936 short range radio telephone set, two three-fourths K. W. 32-volt Delco engine-driven generators, two 70 ft. steel poles and the antenna and ground system.

Here's a Great Loop for a Crystal Set

By *Kenneth Malcolm, A. I. R. E.*

WHILE visiting a friend in Brooklyn, N. Y., the other evening I was asked to listen-in on his radio set. Immediately upon donning the receivers I could hear WOR broadcasting a very fine 'cello solo. The clarity and the audibility were remarkable, and I asked my friend what kind of a tube he was using. He replied that he wasn't using a tube at all, but a galena crystal. Noticing the unusual freedom from static on such a hot night, I inquired the

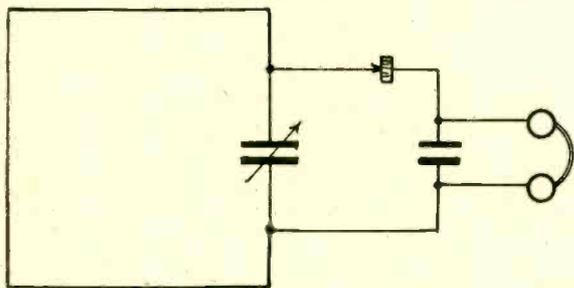


Fig. 1. Circuit diagram for a crystal receiver using a loop antenna as described in the accompanying article.

type and size of the aerial. To my surprise, I learned that there was no outdoor aerial at all, a large loop indoors doing the trick.

Immediately I thought I should tell the readers of RADIO WORLD about this feat, so that those who had crystal sets could make good use of the idea during the summer months. Before, I had been rather shaky about recommending loops for crystal set users, but now I give them whole-hearted endorsement. Of course, they cannot be expected to give the results of

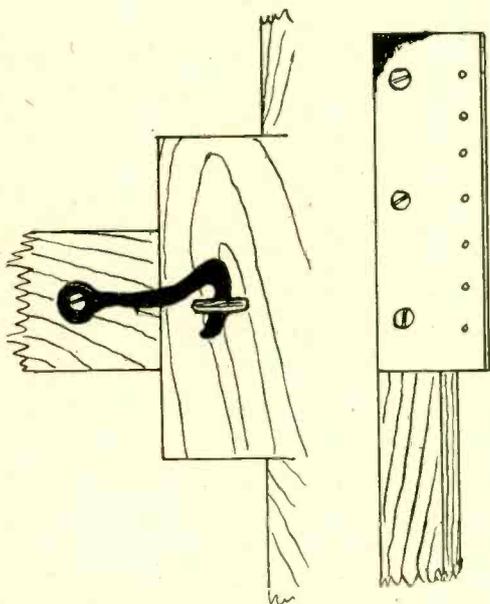


Fig. 2. Method of fastening cross arms so as to keep them rigid when used, or allow them to be conveniently folded. Also details of bakelite strip used for supporting wires.

an outdoor aerial, but for sets that are within ten or fifteen miles from a broadcasting station, they would probably allow good reception at times when by other means it would be impossible. The secret of the whole affair is to get the loop large enough for fair efficiency. The loop mentioned was rather cumbersome, and in

the way when not in use, but the one to be described will for the most part do away with that disadvantage.

Secure four lengths of wood 3' long, 1" wide, and 1/2" thick. Also, a good hardwood block 2 1/2" square and 1/2" thick. Purchase four brass hinges having a width of an inch, and four flat hooks with eyes to match. Four strips of bakelite 1/8" thick, each 1" wide and 4 1/2" long, and about 140 feet of wire, completes the material list.

Sandpaper the wood strips, and see to it that the ends are perfectly square. Now you may give them a coat of stain of the desired color, and then several coats of shellac or transparent varnish. Do the same with the center block. Next you may fasten a hinge to one end of each of the strips; do this so that the hinge may double up toward the part that is fastened. The correct way is shown in the accompanying drawing.

Now take each of the bakelite strips and drill a series of seven 1/16" holes, 1/2" apart in a line 1/4" from one of their edges. Near the other edge, drill three holes to take the fastening screws. When this is done, one may be screwed close to the outer end of each of the strips, with the edge having the seven holes, pointing toward the face on which the hinge is fastened.

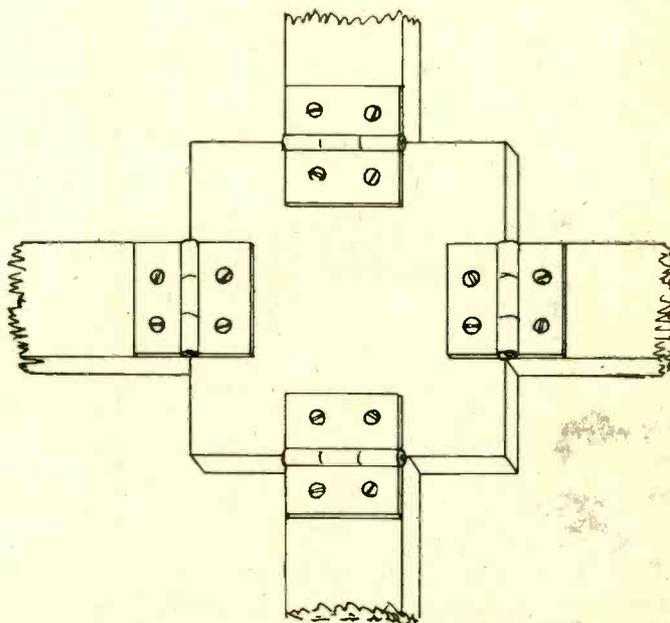


Fig. 3. Manner of placing hinges on ends of cross arms and center piece to allow them to be conveniently folded when desired.

The other ends of the strips may now be fastened to the center block as shown. The ends of the strips should be tight up against the edges of the block. Turn the whole affair over, and on the other side of each strip, fasten a hook and a screw eye so that the loop frame will be held open and rigid when in use.

The wire may now be threaded through the holes. There should be seven turns in all. Most any wire will do for the purpose, but a stranded wire such as lamp cord or Litzendraht would be the best. If you use lamp cord, it might be necessary to make the holes in the bakelite strip a little larger.

On account of its large size, it will be found that the loop can usually be better suspended from a chandelier or something of the sort, than mounted on a base; and

(Concluded on next page)

A Literary Broadcasting Station

By A. Stone

THE literary world has one of the most powerful allies on its side in the form of radio. Through the means of this remarkable invention of man there is no work of pen that is not within the reach of any person who is fortunate enough to own a radio set. It has often been said that the price of important literary works has been prohibitive for the person of small means, that libraries do not often extend the proper facilities for placing the books most in demand before those persons who frequent them, but it seems to me that radio, with such an elasticity of range quite easily overcomes these two main objections.

When broadcasting stations begin rendering such service as quoting from Shakespeare, reading from the Bible, announcing in serial form Well's Outline of History or reciting from Kipling and other famous poets the general public will quickly realize just how important radio is in disseminating literary information broadcast.

At the present time the various broadcasting stations are now rendering a diversified service—that is, their programs not only consist of music but of sports, news, lectures and any other items that might be of interest to the general public. As far as I know there is yet to be established the first broadcasting station that deals exclusively with one subject. There are no broadcasting stations that send out news exclusively; there are no stations that devote their activities exclusively

to music; there are no stations that devote themselves exclusively to lectures.

The station that I am to construct at Milton-on-the-Hudson, N. Y., this fall will be a new departure in broadcasting. I am going to use it exclusively for literary purposes and lectures. I will invite the most eminent men and women I know to visit the station and to talk on famous books and other literary subjects. I shall also try to have authors read their own original works for the benefit of the large radio audiences that I know would be willing to set aside a few hours each week to listen in on subjects pertaining to literature. From time to time I also plan to use the broadcasting station for the purposes of lecturing on some popular subject pertaining to literature.

There have been so many inquiries coming to my home concerning the broadcasting station I am preparing to build, as the result of the wide publicity the original announcement received through the columns of RADIO WORLD, that I am once more taking advantage of this opportunity to state that the station will not be in operation for several weeks as I am still obtaining data that will enable me to establish a station of sufficient power to answer my purposes. I hope, therefore, that the many radio enthusiasts who have written me commending my efforts to establish a broadcasting station with such worthy purposes in view, will be patient.

"Radio World's" Transcontinental Tour



Arthur G. Shirt and RADIO WORLD'S Transcontinental Touring Car.

UNKNOWN to our readers in general, RADIO WORLD went on a transcontinental trip this summer in the person of Arthur G. Shirt, friend and radio adviser of thousands of our readers, and "Radio World," the car.

How this was done is easily explained by the photograph. A. G. Shirt and "Radio World," the touring car, traveled across the United States via the Lincoln Highway, a distance of approximately 4,500 miles. Many people met both the voyagers and after knowing them embraced them in a truly long lost friend manner.

It is said that "Radio World" appealed to everyone, its pleasing personality, and never-tiring "voice" appealing and enlightening approximately 5,000,000 people as to the whereabouts of the best radio weekly.

Mr. Shirt is returning, browned and happy, from a summer in the great outdoors. He says he feels like a two-year old and is "rarin'" to go back to writing.

(Concluded from preceding page)

this easily may be done by fastening a screw eye in the end of one of the wood strips, and fastening a cord through this. When not needed, the loop may be folded together and stowed away in the corner of some closet.

With the loop described, an entire receiving set is not necessary, but simply a variable condenser, a crystal detector, a phone condenser, and a pair of phones. They should be connected up as shown in the circuit diagram.

To get your station you simply adjust your detector, slowly turn the loop, and adjust the variable condenser;

nothing could be easier. If you have all good parts you ought to get really surprising results.

Such a large loop could be used also with a single vacuum tube to advantage. The hook-up to be used in this case would be the same as that published in RADIO WORLD for May 12, 1923. Here you would get almost as good audibility as if you were using a long outdoor aerial, and the selectivity would be much improved.

Large loops are not quite as directional as small ones and the tuning is not as sharp, but they offer more surface to the incoming waves and hence their energy absorption is greater. The effect of this is more pronounced in the case of crystal or non-regenerative sets.

Government Radio Work Needs More Money

By Carl H. Butman

WHEN the next session of Congress takes up for consideration the appropriations to be made for the conduct of the Federal Government during the coming fiscal year, a greatly increased appropriation will be asked for the operation of the Radio Division of the Department of Commerce, which today is struggling along on funds but little greater than those available three and four years ago when broadcasting, as we know it today, was non-existent.

If the Radio Division is to perform its functions effi-

tors; the checking of broadcasting stations and the inspection of ship plants is but a part of their labor. Many complaints are received, some well founded and some imaginary; but all must be investigated, at a great expense of time.

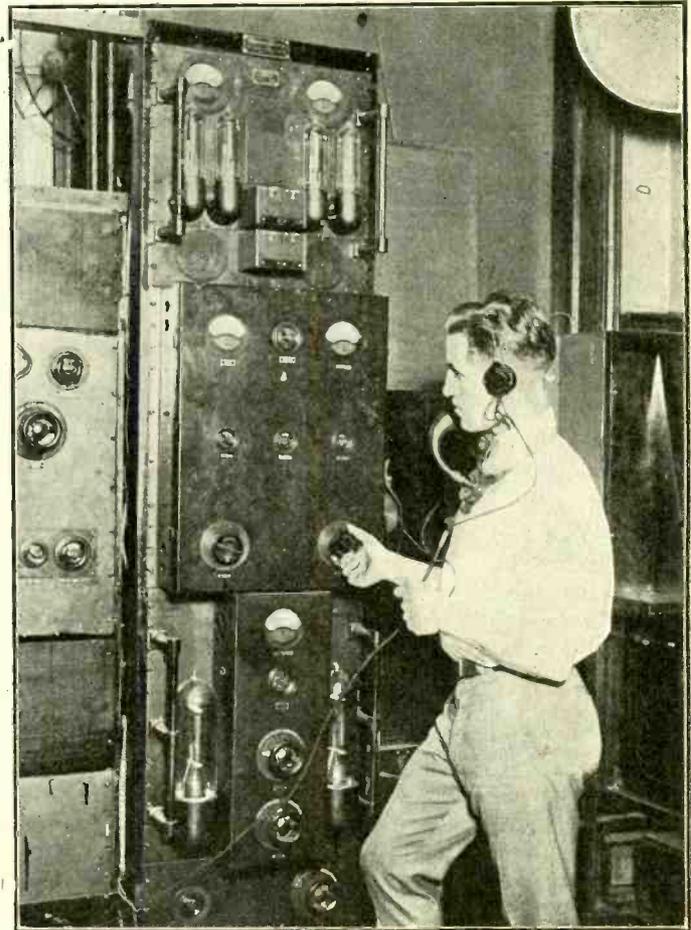
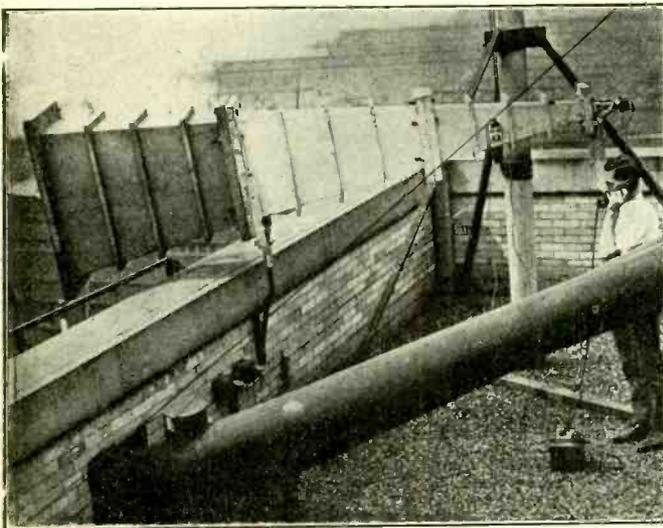
Practically every inspector is overworked, and it is the desire of officials in Washington to give them such assistance as may be necessary for them to carry on all of the many operations which go to make up an inspector's day. At the same time the Washington offices are none too well

Western Electric Roars Farewell to Holmgren

BY means of the huge amplifying horn and speech amplifying device located at the Western Electric Company's plant on West Street, New York City, the officials of the company were able to say farewell to A. Holmgren, Director of Research of the Royal Swedish Telephone and Telegraph Company, after a visit to the United States.

The illustration at the left shows the huge 10-foot horn which carried the voices across the river to the boat on which Mr. Holmgren was sailing. The power amplifiers used are shown at the right.

(Both Photos C. Photogram)



ciently, at least \$100,000 more than is now appropriated will be necessary, it is believed. A greatly increased force of inspectors is needed if the broadcasting stations and amateur plants are to be checked up properly. At present practically all of the time of inspectors on the coast is required for the inspection of ship stations and similar government work, and they are hard pressed for the time in which to make these necessary inspections of other stations. The recent re-allocation of wave lengths, however, makes it necessary that every station be extremely sharp on its wave, if there is to be no interference, and careful checking up of the wave length used is necessary.

Few persons not connected with the work of the Department of Commerce realize what the district inspectors are doing. Many of them are out of bed and ready for their day's work before the last "ham" has signed off for the night. They travel great distances; most of them have automobiles for facility in covering their territory and run the speedometer up many thousand of miles in the course of a month. All sorts of work come to the radio inspec-

supplied with labor, and hard work and long hours are necessary for the handling of the great mass of data, reports, complaints, letters, applications, etc., which pour in in a steady stream.

Makes It Work Smoothly

A LITTLE vaseline lightly rubbed on the switch-points of the receiver will make the arm slide easily over the points and obviate any chance of friction wearing the points down. The fact that it is an oil base product does not affect the electrical contact in the least, but if anything, makes it better. Along the same time, a drop of oil on the bearings of the condensers makes the rotor turn smoothly, if too much is not put on.

Radio for the Farmer and the Rural School

By *Kenneth M. Swezey*

THE greatest hindrance to development and civilization is isolation. Africa is in the place she is now in today because of her previous inaccessibility. China, Persia, and the rest of the Far East are mouldering in the remains of a civilization of centuries back, simply because they shut off the rest of the world with its new ideas. The farmer of our own country has until recent years been held back by the same conditions, by the separation from his city brothers necessitated by his location and inadequate means of transportation and communication. The extension of the railroads offered him his first chance to keep pace with the outside; and the automobile increased this possibility manifold. Today, radio broadcasting makes the link which—in addition to the railroad, automobile, and telephone—gilds the farm as attractively as it does the city. The farmer needs no longer be bored by solitude, miss the frivolity of city life, lose crops on account of insufficient information, nor be deprived of a high grade education. The acquisition of a radio receiving set will bring knowledge, entertainment, comfort and pleasure right into his home.

Just what can radio do for the farm home, and what are the easiest means to the end? First of all, a radio set would be a social advantage. It would acquaint the rural citizen with the doings of his neighbors and his friends of the city. It would bring to him the music, the literature and the wisdom of the outside.

Who can repress the thrill that come when listening to the sextet from "Lucia," the purifying quiescence of a violin rendering of Massenet's "Elegie," or the longing remembrance occasioned when a soft but mellow tenor voice carries the strains of "When You and I Were Young Maggie"? The classics in music are character builders beyond the shadow of a doubt. Yet, before this time, what chance had a farmer to hear an opera, or even a selection from one, except on the phonograph? Now, things have changed and he has but to tune in to get the food that will feed his deeper self and make him a better and stronger citizen.

The younger generation of the country are as much addicted to jazz as are the finale-hoppers and flappers of the city. And radio affords an admirable means to keep them in their own community by bringing to their Town Hall the famous jazz orchestras of the big cities. It also keeps them posted on popular music.

Radio bring the governmental representative and the others in office and introduces them to the farm. No longer can the farmers be hoodwinked and dumswiggled into voting for some one they do not know, on the basis of soap box orations and unscrupulous mail propaganda. Radio puts them in direct touch with the administrators whom they pay to look after their welfare and the whole business becomes personalized and "man to man." The wideawake man on the farm, with his radio set, can be much more well informed than can an indifferent man in the city.

To those in the more remote localities the Sunday radio services are a boon. Deprived of all but an occasional attendance at church, the isolated farmer rejoices at a chance to hear the hymns of his faith sung by noted soloists, or famous choirs, or played by an artist on a priceless organ, to hear an inspiring sermon from the lips of a worthy preacher. All this is something new and wonderful to him.

Even in small communities where they have a church, the members are not always able to pay a regular minister or to pay for any music, save that which is furnished from among themselves. Here, a radio set with a loud speaker serves effectively. Either it replaces a regular minister entirely, or is used in emergencies.

Radio has also a great educational value. Listen in on any program, and you will usually find that some educator has been included, someone who will leave you with more knowledge than you had before. Possibly it is an explorer who has just returned from the heart of Africa who tells of the animals, the vegetation, and the living conditions there. It might be some scientist trying to explain the Einstein relativity theory. Or it might be some teacher leading his radio class in the more practical study of stenography, language, domestic science, or one of a thousand other things.

As an adjunct to the rural school the value of radio cannot be overestimated. Just as a distant minister can be brought to the church, so can a teacher be brought to the school. In fact, a different teacher could be procured for each subject, whereas formerly a single resident teacher had to do all the work as best he could. When a definite system has been worked out, a staff of competent teachers could be kept at central points, and their instruction could be broadcast to all the small schools within hearing distance. A single teacher could be kept at these small schools to offer whatever personal guidance is necessary. In this way the expense would not be materially increased, and at the same time the pupils would be getting the best of high grade instruction. Of course, the resident teacher cannot be entirely dispensed with, but radio can bring personalities into the classroom that would not otherwise be available.

A class on civics could be taught admirably by radio and the leaders of the country could themselves be the teachers. What would inspire patriotism in the hearts of the country's youth more than to hear the voice of the President, his cabinet, and the minor executive and judicial heads? Soon Congress will be hooked up to a broadcasting set and the proceedings, as they occur, will be broadcast to the country. Important conventions and the like will be broadcast also.

Radio music could be well brought in as a part of the school curriculum. It would acquaint the pupils with the composition, composers and musical artists of our nation and of others.

Economically, radio is in to do its part for the farmer. It is the speediest and most accurate crop bulletin that ever was or ever will be devised. The Department of Agriculture sends crop reports daily from a number of big stations, covering territory all over the country. This is of inestimable value. Then, too, the weather reports that are sent out daily are not to be disregarded. These help the farmer to "make hay while the sun shines." One writer has recently acclaimed radio as the "Voice of God" to the farmer. Whether it be this or no is not to be disputed, but it certainly is becoming a beneficent and indispensable part of farm life.

Is it possible for every farmer to own a radio set in the near future? Yes, it is possible. And as soon as they become inoculated with sufficient virus of radio bacilli, and fully understand their possibilities, they will have them. There is no doubt about it!

A Home-Made One-Tube DX and Loud Speaking Receiver

By Byrt C. Caldwell

THIS receiver is an especially good model of the reflex receiver which is so popular now. To the owner of a regenerative set the reflex is a revelation. There is absolutely none of the howl which is so apparent in regenerative sets. When tuning, there is no whistling of the carrier wave and no distorted tones. Music and voice are tuned in strong and clear without the troublesome work of clearing out the "music" which is experienced by most fans. The quality also surpasses that obtained on the regenerative receiver. Control is much simpler and the reflex is much more sensitive than the regenerative receiver. By all this I do not mean to belittle the regenerative receiver. Wonderful results are, of course, obtained on this set by an experienced operator, but for the beginner the reflex is undoubtedly the best—for him and for his neighbors.

The writer designed and built the receiver which is described here. There is some slight variation from the standard reflex circuits but these changes are for the better.

connections as short as possible, soldering all contacts. Run wires at right angles to each other whenever you can, but do not attempt to make a good-looking job by running all the wires so as to make perfect right angle bends. The wiring of the set should be done for efficiency and not for looks. Right angle bends look

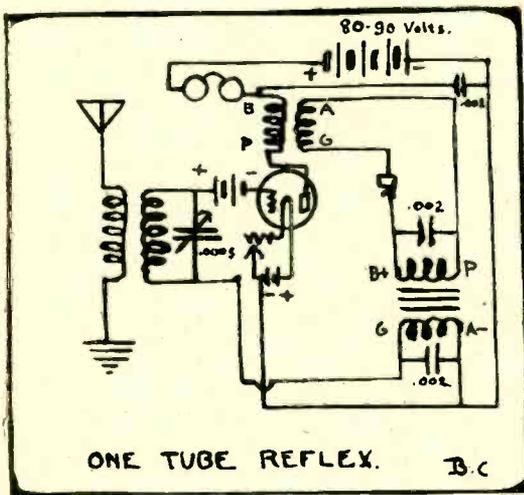


Fig. 1. Schematic diagram of a one tube reflex that can be made to work a loud speaker.

The arrangement of the instruments on the panel and base is shown. No wiring is shown in this diagram, as it would lead to confusion. All of the instruments are arranged so that the shortest leads possible can be used. A two-plate mica dielectric condenser was used by the author but this is not absolutely necessary. The tube socket is mounted directly in back of the "window" and the socket for the radio-frequency transformer is mounted back of this. The audio-frequency transformer is to the right of the R. F., and the crystal detector, which should preferably be of the fixed type, is placed between the two, directly underneath the B+ of the audio transformer. A .002 fixed condenser is mounted across the secondary, and one across the primary of the A. F. transformer. One is also connected directly to the positive B battery binding post. The grid battery, which must be used for the UV199 and C299 tubes, and is used to advantage with other tubes, is placed as close to the grid terminal of the tube as possible.

When wiring use bus wire if possible and make all

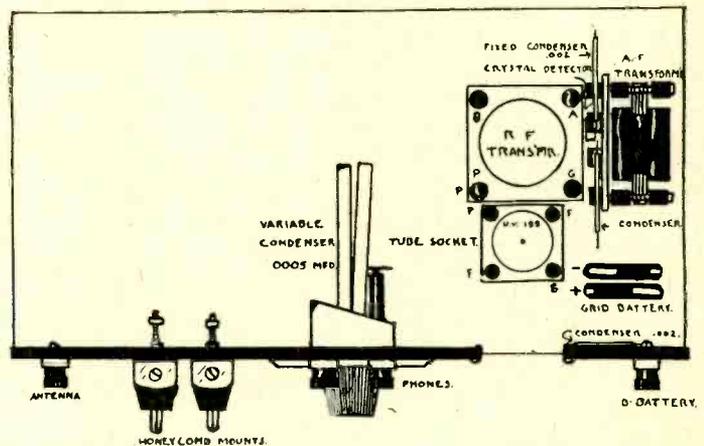


Fig. 2. Panel layout and arrangement of parts on base for efficient wiring. A hook type condenser is used for convenience and to save space.

good, but if the builder remembers that "a straight line is the shortest distance between two points," he will obtain better results.

Honeycomb coils are used in place of the conventional variocoupler. There is no deadend loss to these coils and they are simpler and easier to operate. One 35 turn, a 50 turn and a 75 turn coil are all that are required. Change these about until the best results are obtained.

The writer used a UV199 tube in this set and 112 volts on the plate, although better results could probably be obtained with a 201A or 301A tube with 150 volts on the plate. In most hook-ups given no

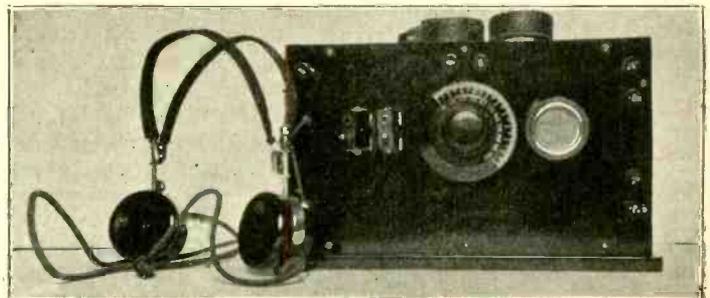


Fig. 3. Photograph of completed set, showing compact size and neat arrangement.

grid battery is designated. With the UV199, however, this is necessary for the best results.

No filament rheostat was used, as this simplifies the control, and as a rheostat is unnecessary with the hard tubes employed.

To tune, simply light the filament, tune the condenser and vary the distance between the two coils until the

(Concluded on next page)

Increase Use of Radio for Fog Signals

By Carl H. Butman

WASHINGTON, D. C.—Radio, within the next few years, will play an increasingly important part in the work of protecting those who go down to the sea in ships from the mishaps which have made life on the ocean wave more of a peril than a pleasure, according to George R. Putnam, Commissioner of Lighthouses.

Commissioner Putnam, as a result of his experience with radio in the Lighthouse Service, is an enthusiastic supporter of this means of communication, and expressed his opinions strongly at the recent International Congress of Navigation in London. At that time he asserted the belief that radio for signals was destined to become one of the prime factors in life saving work, and, since his return to Washington, has plunged into plans for extending the use of radio in the Lighthouse Service.

Although not the first country to install radio fog signals—France having done so several years before we took the matter up—the United States today leads the world in the number and efficiency of such signals, and our methods are being studied abroad in those countries where the subject is under discussion. Our radio fog signals are all sent out on a 1,000-meter wave length. Those of France were sent out on a very low wave length and were lacking in efficiency, and the French Government now is remodeling all sets so as to use the internationally-adopted wave length of 1,000 meters.

Radio fog signals, as their name implies, are sent out in foggy weather to warn mariners that they are near dangerous coasts. They have an all-weather range of some 30 miles, but this range can be extended, if greater distance is deemed desirable. The sets are automatic, needing only to be started, and are cared for by light-keepers and others, no special radio knowledge being required.

The apparatus now used is actuated by spark sets, but the service is soon to install the first of the tube sets which will eventually supersede all spark apparatus. The conversion from spark to tube is being made in order that a sharper signal be sent out, that interference between nearby fog signals may be eliminated and in order that the apparatus may be used for other purposes than fog signals.

A plan is now under consideration of using these fog signals at all times, regardless of weather conditions, that vessels may use them for location purposes. There has recently been established on the Pacific Coast a new south-bound route for coastwise traffic which is many miles out of sight of land, and it has been suggested that the fog signals along the route be sounded constantly that they may be used by vessels equipped with direction finding apparatus, for determining location.

Another scheme under consideration by Commissioner Putnam is that of sending the fog signals upon request of any vessel desirous of determining its location, the request to be transmitted by radio to the nearest receiving station. At present, the radio for signals in the vicinity of New York send for two 30-minute periods each day, one in the morning, the other in the afternoon, and many vessels take advantage of the opportunity to test out their direction finders.

"Radio for signals gives promise, for the first time, of placing at the disposal of navigators beacons for use in fog comparable to lights in their dependability and the possibility of affording accurate bearings, superior to lights in their range and usefulness under all weather conditions," declares Commissioner Putnam. And, with that idea always in view, the Lighthouse Service is devoting much time and thought to the greater use of radio, the only new aid to navigation developed for a number of years.

Short and Snappy

MANY are the amateurs who like to "CQ." Of course this is the easiest manner of attracting attention if you own a CW outfit; but the international regulation specifically states that a call is to be sent three times followed by "de" designating the abbreviation form and then sign your own call three times. If you do not get an answer within a reasonable length of time repeat the performance.

Why in the name of all that is fair and good under the sun will nine out of ten amateurs C Q a baker's dozen, sign a couple of dozen and then without even

stopping repeat the performance over again? One amateur was heard on 200 flat with a note like a humming bird at close quarters (sweet was no name for it) actually "CQ" 18 times by actual count, sign six and then repeat the performance. Supposing some other fellow wanted to get "through" to him? Do you expect he is going to patiently wait until he gets all through with his "code practice" until he calls him? Decidedly not. He will take his receiver elsewhere and talk to a rational body who does not have the idea that everybody must like to listen to his "fist" and beautiful "note" on a 20 watt input. Go to it fellows, but for the Old Man's sake, be sane!

(Concluded from preceding page)

best results are obtained. When the set is first made, you will have to find the proper value for the grid battery. This will vary between 3 and 15 volts, according to the tube and the plate voltage used.

The action of the set is as follows: When it is tuned, the radio-frequency oscillations are impressed on the grid of the tube. As the secondary of the A. F. transformer is in the grid-filament circuit, it is shunted by a fixed condenser. The tube amplifies the oscillations and relays them to the circuit which consists of the plate, primary of the R. F. transformer, condenser which is shunted around the phones and B battery, and the filament. The induced oscillations in the secondary

of the R. F. transformer are rectified by the crystal, and sent into the primary of the A. F. transformer. They are stepped up to a higher voltage here and sent through the circuit which consists of the secondary of the A. F. transformer, grid and filament, this time at an audio-frequency. The tube again amplifies and relays the signals to the plate circuit. They flow through the primary of the R. F. transformer, and as they are now of an audio-frequency, they will flow through the phones instead of through the condenser.

This explanation shows how one tube in this circuit is as good as three in a plain circuit. If care is used in the selection of good parts and these directions are closely followed, no trouble will be encountered.

Increasing the Efficiency of the Receiving Set

By Byrt C. Caldwell

THIS article is written for the great majority of the radio public who own single circuit regenerative sets, or sets that regenerate by means of capacity feed-back, instead of by the more flexible inductive feed-back which is employed in the three circuit sets.

The amateurs (not the broadcast fans) long ago proved that the three circuit set was by far the better set of the two for both sensitivity, volume and selectivity. However, the idea is held by most broadcast fans, that the three circuit set is best only for its

it can easily be added. Briefly, the improvement consists of two honeycomb coils, connected in series in the plate-grid circuit. Room may easily be found for the coils over the variocoupler, or some place else on that side of the panel. Two 50 turn or two 75's will do, or if you happen to have a set of them, you can try different combinations until the best results are had. Connect them in series as shown. Be sure that the connections of one of the coils has not been reversed. Regeneration is controlled by varying the distance between them. If room can be found on the panel, a variometer may be used in place of the honeycomb coils. This would certainly be more convenient to operate. As to which would give the best results, I could not say, as I have not tried the variometer. I believe that the variometer would be more satisfactory.

The coils may be either back or front mounted. The diagram illustrates the arrangement of the instruments used in the hook-up shown.

The hook-up indicates how the coils are inserted in a circuit of this type. If your hook-up is of a different kind, you can easily place the coils in their proper positions by referring to the hook-up given. Place them in the plate-grid circuit.

Try this out. You will be surprised at the great

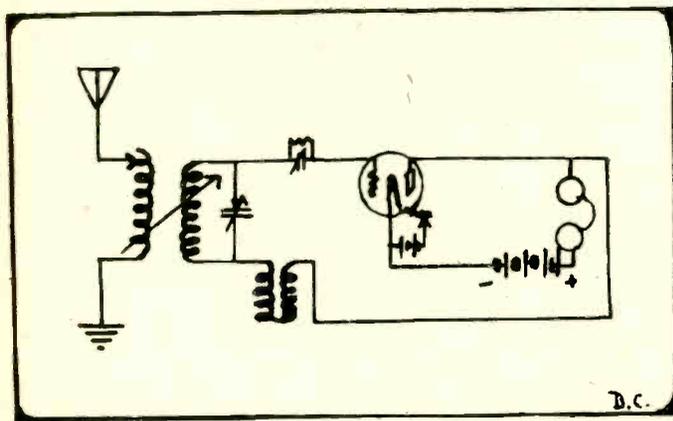


Fig. 1. Hook-up showing Caldwell's method of increasing the efficiency of the receiving set.

selectivity, and that the single circuit set excels when volume is desired. The amateurs are right. The reason that the fans have gained this impression is that they have seldom taken the time, and have seldom gained the necessary experience, to be able to tune the three circuit set for maximum results. I believe that any amateur will corroborate this statement.

The reason that maximum results cannot be obtained with these simplified circuits is that little control is had over the amount of regeneration obtained.

The writer has designed a set, or an improvement which can be added to any set, which increases the selectivity and greatly improves the results obtained, often doubling the volume of the signals. This addition puts the regeneration under control and in this way greatly improves results.

In constructing the set this improvement can be built right in. However, if the set is already made,

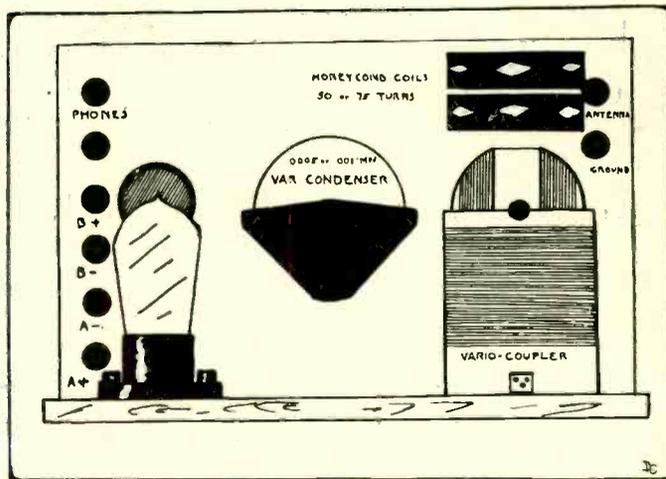


Fig. 2. Caldwell's suggested panel layout for increasing the efficiency of the receiving set.

improvement which results and the ease with which you can tune out some of the stations which formerly came in together.

Conserve the Current!

IF you were to measure the current that actually travels through the primary circuit of the radio receiver you would understand why it is that most receivers of the home-made type do not function well when it comes to distance. The actual current is so infinitely small that it is almost negligible, and when that same current has to actuate the delicate phones and other apparatus through a circuit that is full of high resistance joints (a soldered joint can be high resist-

ance if it not done properly) you will probably understand why your set does not function as well as Jimmie Jones' even though you use better apparatus. He has his well soldered (not sloppily and without excess flux) and conserves the current. Think that over in your spare moments and then examine your set the next time you are hunting for that elusive distant station that just murmurs faintly in your phones, and which is plainly audible in Jim's.

Radio Pictures P Variety as



(C. Photonews)

The cast of the Radio Revue, a new departure in radio entertainment which has proved intensely popular. By broadcasting revues of this sort from WJY, stars like Kin Carroll, Art Conrad, Harry Hanbury, Frank Taylor, Raymond Ghee and many other scintillating Broadway favorites are able to reach many hundreds of thousands of interested radio listeners.



(C. Kadel and Herbert)

Dolores Cassinelli, noted woman fencer and instructor, taking a few moments' rest after a strenuous fencing lesson. Miss Cassinelli is a great believer in strenuous sports and a constant supporter of radio. She has a complete receiver in her room at the Hotel Majestic, New York City, as is shown, and takes great delight in tuning in on those distant stations.



American and Canadian radio fans who have listened in to CKAC, the broadcasting station of La Presse, Montreal, have had a treat during the past few weeks, thanks to the co-operation of the White Star Line. Each Thursday night a special program was arranged by one of the White Star ships that was in port and the music was broadcast through this station. The illustration shows the quintette of the S. S. "Doric," the largest ship to enter Montreal harbor. Left to right, they are Harold Cowgill, Ernest Jowitt, Arthur Ransley, Sam Wooley, Edward Cappel. They have introduced several of the latest fox trots and waltzes through the medium of radio.



(C. Kadel and Herbert)

An interesting illustration showing how seriously some of the farmers' boys take to radio. Fred Alden, of Oakland, Maine, even takes his portable set out to the pasture while milking and uses the fence as an antenna. "Bossy" must be wondering where all the music is coming from.

Paul Whiteman's S.S. "Leviathan" From New

THE broadcasting by Station WJZ of Paul Whiteman's S. S. "Leviathan" Jazz Orchestra from the dock at the foot of West 46th Street, New York City, upon the return of Paul Whiteman himself from his successful trip to London, was an innovation never before attempted in broadcasting. The cheers of the crowds that recognized "Our Paul" and the strains of his famous "Leviathan" orchestra was something that, to say the least, was most novel.

The left hand illustration below shows the S. S. "Leviathan" orchestra on the dock before the microphone, preparing to broadcast one of their selections. The right hand illustration shows the "pick-up" and amplifying panels used to switch the microphone on and amplify the tiny impulses preparatory to sending

(Both photos C. Kadel and Herbert)



Provide as Much Life Itself

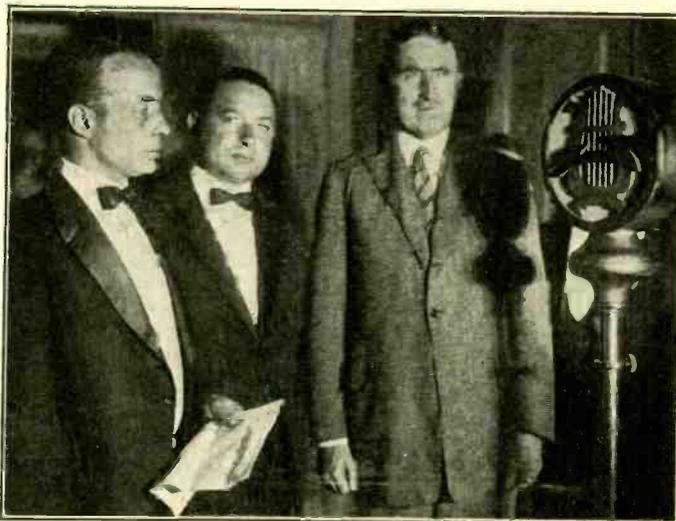


(C. Kadel and Herbert)

Here is a hint to mothers who have trouble in putting baby to sleep when out in the park. Take your De Forest set along and you won't be bothered by rocking him to sleep, and at the same time it will amuse you and keep you from feeding too many peanuts to the squirrels.



Leon Abrams, president of the Radio Chain Stores Co., of Trenton, N. J., being entertained while watching the bathers in the Delaware River by means of his portable loop receiver. This is a tip for the canoeists. Take your portable set along with you instead of your "uke" and you can have variety—everything from a lecture on the evils of the drug habit to a cornet solo played by a member of the Police Band. This is the spice of life, these days.



(C. Underwood and Underwood)

Theodore Roosevelt, Jr., Assistant Secretary of the Navy; Major General Frank L. Hines, Deputy Chief of Staff, U. S. Army, and David Sarnoff, Vice-President and General Manager of the Radio Corporation of America, officiating at the opening of the new station WRC, Washington, D. C. Theodore Roosevelt, Jr., delivering the commemoration speech before the microphone of the new station.

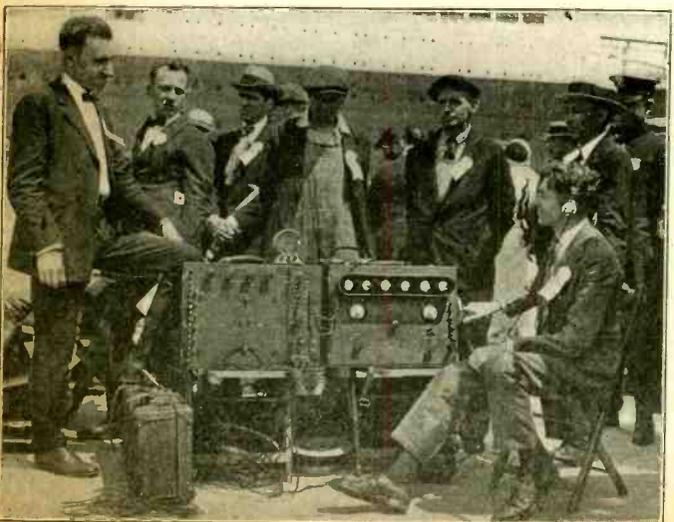
n" Jazz Orchestra Broadcasts York Pier

them over land lines to be further amplified and then broadcast.

The recent arrival of the famous leader of America's most famed institution of musicians created quite a furore in broadcasting circles, and there is no doubt that every listener wishes that Paul Whiteman had a chance to arrive about three times a week.

On the evening following his arrival, the fans were able by means of radio to be present at a complimentary dinner tendered to him and to hear the speeches and music. Well, there is little happens these days that the hundreds of thousands of listeners miss.

Of note to radio fans will be the fact that the power speech amplifier is using six UV201A tubes instead of the regular five watt tubes that are most usually incorporated in the apparatus.



Radio wedding candidates inspect broadcasting station WLW from which the ceremony will be broadcast. Mr. Powell Crosley, Jr., Chairman of the Radio Committee of the Cincinnati Fall Festival, explaining the working of one of the presents that are to be given to the principals in the forthcoming weddings. The ceremonies will be broadcast on September 4 from the Music Hall, Cincinnati.

Report on Fading New Stations Licensed

HARTFORD, Conn.—Fading shows no partiality to radio fans since all listeners have noticed that it interferes appreciably with the reception of broadcast programs. Fading is the variation in reception intensity caused by atmospheric conditions beyond control of the listener and cannot be associated in any way with the type and construction of receiving apparatus in use at the time.

A program may be coming in with such strength that it can be heard throughout an ordinary room when suddenly the volume of sound will diminish until it is scarcely audible with the receivers held close to the listener's ears. Observations of this condition have been completed by the U. S. Bureau of Standards in conjunction with the American Radio Relay League. A brief summary from the report to appear in the September issue of "QST" follows:

"Observations to date indicate that the fading is greatest for waves within a certain range of wave lengths, and is less for either longer or shorter waves. Fading is more pronounced at wave lengths in the neighborhood of 250 meters than at longer wave lengths. Transmission experiments using 100 meter waves indicate less severe fading than on 250 meters.

"It is easier for a large mass of something to somewhat obstruct a 200-meter wave than a 2,000-meter wave.

"A preliminary statistical study of the transmission range of certain broadcasting stations, which has been made since the work described here was done, indicates that at a distance of the order of 150 miles from the transmitting station a noticeable decrease is observed in the signal intensity, which increases again for greater distances.

"The distance at which this occurs varies with the wave length, which suggests that its explanation is associated with the variation of ground absorption with wave length."

FOUR new radio broadcasting stations were given licenses and six stations were transferred from Class C to Class A during the week of August 13, the Radio Division of the Department of Commerce reports. Of the new stations, only one was in the eastern section of the country.

New Stations

Call	Station	Class	Frequency Keys	Wave Length Meters	Power Watts
WTAH	Ferro, Carmen, Belvidere, Ill.....	A	1270	236	10
KFJM	University of North Dakota, Grand Forks, N. D.....	A	1310	229	100
KFJQ	Valley Radio Div. of Electric Construction Co., Grand Forks, N. D. (portable station).....	A	1190	252	5
KGB	Tacoma Daily Ledger, Tacoma, Wash.	A	1190	252	50

Transfer Class C to Class A

Call	Station	Class	Frequency Keys	Wave Length Meters	Power Watts
WDAH	Trinity Methodist Church, El Paso, Texas	A	1120	268	100
KDZB	Siefert, Frank E., Bakersfield, Calif..	A	1250	240	100
WNAL	Rockwell, R. J., Omaha, Neb.....	A	1240	242	20
WIAI	Heers Stores Co., Springfield, Mo....	A	1190	252	20
KXD	Herald Publishing Co., Modesto, Calif.	A	1190	252	10
WCAS	Dunwoody Industrial Institute, Minneapolis, Minn.....	A	1220	246	100

"Use Radio Sets in Balloon Races"—Olmstead

REPORTING officially to the Chief of the Army Air Service on the use of radio in balloon races, Lieut. R. S. Olmstead, winner of the recent race says in part:

The S-6 balloon radio installation complete with antenna and counterpoise weighed around thirty pounds, representing roughly one bag of sand ballast. Both Lieut. Shoptaw and myself agreed that it was worth several times its weight in sand. It should always be remembered, furthermore, that the set could be used as ballast quite efficiently by the simple process of disassembly.

Immediately upon taking off we dropped our antenna and (copper screen) ground and wired up to receive. The results were uniformly good from the first. Musical program after musical program with great clearness came in, and incidentally the Dempsey-Gibbons fight returns came from Detroit by rounds. There seemed always to be music in the air, and to anyone who has experienced the monotony, when everything is going well, of the hours of darkness in a balloon race flight, the value of such restful relief therefrom is very evident. There should always be two head-sets provided to a basket; we had but one. They do not interfere in the least with the work of the pilots, and the tendency is to wear them at all times.

From Detroit, Chicago and Schenectady, particularly

from Schenectady, we received quite definitely the weather reports consisting of general flying conditions, wind directions and velocities, cloud conditions, and of great importance, the pressures recorded at various important cities. This information was quite conclusive in influencing our tactics to obtain a suitable direction of flight in order to obtain maximum endurance and distance. A feature which should be added and which we keenly felt the need of for several hours while out of sight of any land marks over Lake Erie is a direction finding attachment. A loop hung above the load ring with compass attached thereto, it is believed, would solve this problem.

A point of vital importance in a race was the advice received by radio of the location of our various competitors from time to time. At the time of landing we knew that all but three of our competitors had been accounted for, and we were quite certain that we were in one of the three winning positions and eligible to go to Belgium. Had we not had this information, we might have tried to cross Lake Ontario without sufficient ballast, and failing in the attempt, would have disqualified ourselves.

My recommendations are that a radio set should be installed in every racing balloon, directional attachment should be added and two head-sets should always be provided.

Latest Radio Patents

Carrier Radiotelephone System

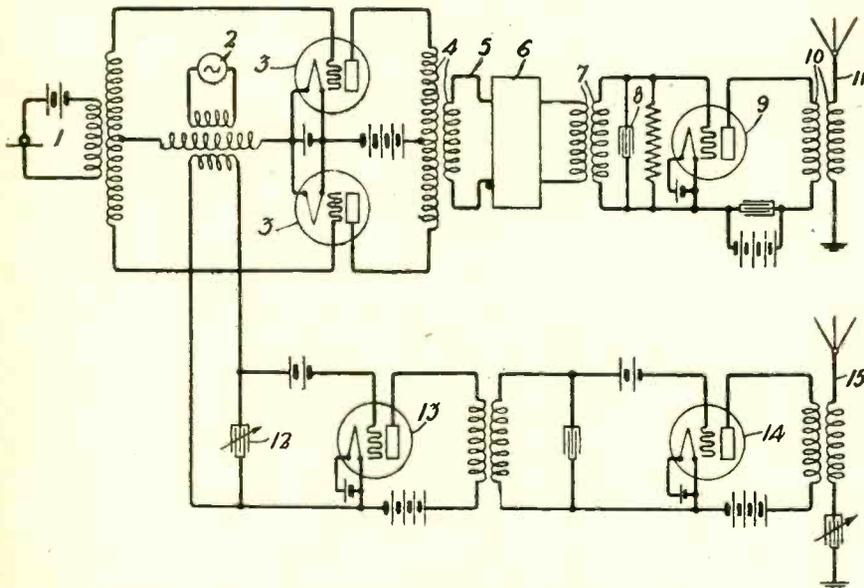
No. 1,458,949: Patented June 19, 1923. Patentee: H. W. Nichols, Maplewood, N. J.

This invention relates to a method of and means for transmitting signals, and more particularly to carrier telephone systems.

It has been proposed in signal transmission by modulated carrier waves to prevent the transmission of the unmodulated carrier wave component, while providing for the efficient transmission of the modulated carrier wave component, as described in the Journal of the A. I. E. E. Vol. XL. No. 4, page 314, April, 1921. It has also been proposed in a carrier system, to transmit a signal modulated wave i. e. the modulated carrier and two side band components and an unmodulated wave of frequency different

the receiving station, as in the first system, or the additional detector, etc., as in the second system, to effect detection or demodulation of the incoming signal waves, whereby speech currents may be supplied to the receiver.

The present invention is directed to a system in which all the advantages inherent in the two systems briefly described above may be utilized and consequently a much greater economy of power and apparatus may be secured. According to this invention a carrier wave is modulated in accordance with speech frequency currents, the unmodulated carrier component and one side band are suppressed, the remaining side band of the pure modulated wave and a selected amount of unmodulated energy from the



Method of producing a pure modulated wave whereby the unmodulated carrier component and side band are suppressed.

from that of the carrier wave. At the receiving station the signal modulated and unmodulated waves are combined to produce a signal modulated wave of intermediate frequency which is then selected and again detected to give the signaling current.

The present invention has certain advantages over each of these systems in that it does not require a synchronously operating source of local oscillations at

carrier source are transmitted independently and more efficiently to a distant co-operating receiving station where they are combined.

The primary object of this invention is to provide a carrier system which is both efficient and economical. Another object is to provide means whereby a pure modulated wave and energy of the fundamental carrier frequency may be transmitted from a signal station.

Electron Emitting Cathode

No. 1,459,400: Patented June 19, 1923. Patentee: C. D. Hocker, East Orange, N. J.

This invention relates to electron emitting cathodes, and the process of making the same, and has for an object to improve the characteristics of such cathodes in any one or more of the following particulars:

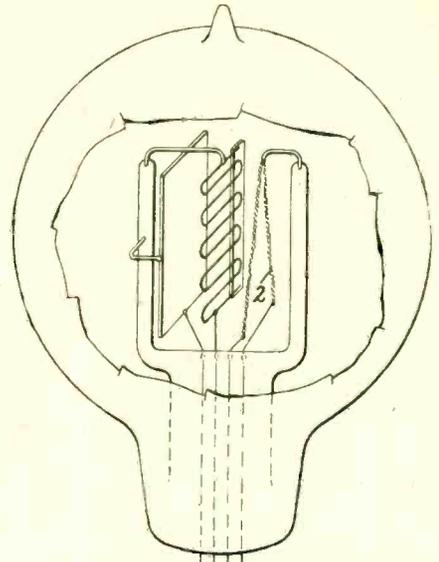
A.—To make the thermionically active coating adhere more firmly to the electrode or filament by mechanically binding the active coating materials to the filament.

B.—To increase the electron emission at any given temperature.

C.—To lengthen the life of the filament at any given temperature.

This is accomplished by adding another substance such as a noble metal to the coating before it is applied. By noble metal is included compounds of a noble metal from which the noble metal may be produced by heating a compound thereof; for instance, gold, silver and platinum may be produced by heating gold oxide, silver oxide and ammonium chloro-platinate, respectively. Among the noble metals may be mentioned silver, gold and platinum, and the presence of one of these metals in the filament coating has been found to give the desired result. Whether the noble metal will serve to mechanically bind the coating to the filament, whether it increases the electron emission or length of life, of any combination of these, depends upon the

noble metal used as well as upon the particular thermionically active substance or substances of which the coat is composed. The particular substance used in the coat, and the properties of the filament that are thereby improved will be later described.



Details of a vacuum tube of the triode type which allows treatment whereby added electrance emission is possible.

The use of a material in the coating which serves to mechanically bind the coat to the filament has two distinct advantages: First, it makes it possible to apply any coating in an adherent form; second, it permits the application of coats composed of a mixture of substances of definite proportions—a definiteness which cannot be insured when these substances have to be alternately applied in layers as previous filaments have been made.

Electric Condenser

No. Reissue 15642: Patented July 3, 1923. Patentees: C. F. Smith and W. H. Smith, Brooklyn, N. Y.

Our invention relates to electric condensers and has for its object to provide an improved simple and efficient condenser of this character, and also an improved method for the easy and expeditious making of such condensers. Condensers of our improved type are intended primarily for use in wireless telegraphy or telephony but they are also adapted for other uses.

A satisfactory embodiment of a condenser made according to our invention is shown in the accompanying drawing. The condenser there illustrated comprises units any number of which may be assembled readily to form a condenser of the desired capacity. Each of the units shown comprises a base or body portion which gives the unit the requisite strength or stiffness; a flexible dielectric, preferably paper impregnated with insulating material, such as wax; and sheets of metal foil preferably non-resilient metal, such as lead or "tin foil," though other metal foils may be used; such dielectric and metal foils being folded or wrapped together.

Industrial Notes

Electric Equipment Service Co., Pittsburgh, Pa., plans to erect a new factory building on Liberty Avenue.

The Maring Wire Co., Muskegon, Mich., manufacturer of magnet wire, has taken possession of its new factory building at Western Avenue and Barclay street.

Answers to Readers of Radio World

I have constructed the circuit shown on page 8 of RADIO WORLD, April 7, and find that while local stations come in strong, I cannot get any distance. Could I apply the super-regenerative principle to this receiver in order to get distance?—James E. Stevens, 1734 K Street, N. W., Washington, D. C.

You should not expect to do any distance work in the summer months. The fact that you receive local stations strong proves that the circuit will bring in distance in the cooler months. Even the circuits employing three and more tubes are hampered as to distance in the summer. Be satisfied that you have a very good circuit and do not bother with super circuits. They create lots of interference due to re-radiation of oscillations and are hard to tune. Excellent work has been done with the three circuit set you mention—in the cooler months. During the summer you should be satisfied to receive strictly local work, with probably a medium distance station on a cool evening or very early in the morning.

* * *

I have constructed the three-circuit type set using two variometers (moulded) and variocoupler. It works fine except for a high pitched whistle which I have brought to a medium by adjusting the grid leak, but still it is loud enough to be extremely bothersome when trying to listen to any programs. I can stop it temporarily by touching the shafting of the grid variometer and the ground post. How can I stop the whistle without doing this? Reducing the filament current does not help any as it squeals whether the filament is low or high.—Henry Ensminger, Pulaski, Ia.

Your trouble is probably due to the fact that your variometers and coupler are crowded together too closely, and therefore you are getting coupling from your grid and plate circuits. Space them and ground one side of the filament circuit, being careful that you do not short any part of your circuit. This should stop the squeal.

* * *

My neighbor and myself both have single circuit receivers, both designed and built the same, using the circuit described as the Colpitts oscillator. Neither of us can get any satisfactory results when we are both on as when one is tuned in it produces howls and screeches in the other. How can this howl be stopped?—J. L. Barney, Kelly Street, Bronx, N. Y.

There is no method of curing the howls caused by re-radiation on nearby single circuit sets. As long as both sets are in operation at the same time and listening to the same station, or on the same wave length, you will both be bothered with this howl. The particular type of set you mention is a very violent producer of oscillations and in receiving it really acts as a miniature transmitter, creating a carrier wave of its own, which is what you both notice so much.

* * *

I have four variometers, one 23 plate condenser and one 43 plate condenser, honeycomb coils 35, 50 and 75. Should I have a variocoupler? If so what make should I use? Is it possible to use R. F. ahead of the first tube in the Flewelling? Is this circuit superior to the super that uses D. L. 1250 and 1500 honeycomb coils? Is the Turnbull circuit with one stage of amplification superior to Flewelling and one stage of audio-frequency?—C. W. Fisher, P. O. Box 476, Souris, Manitoba, Canada.

You do not state in what circuit you want to use all the apparatus. There are several good makes of coupler on the market. If they bear a standard and well known trademark they are safe. It is not possible to incorporate radio-frequency with the receiver you mention, as the oscillations gen-

erated by the "super" action would render the circuit impossible to manipulate. Sufficiently loud signals should be obtained with this circuit to satisfy, but it is not as loud as those received on an Armstrong super-regenerator when properly operated and constructed. Turnbull has written several articles. You do not mention which one you refer to, so we cannot compare them.

* * *

Will you kindly check the enclosed hook-up and let me know if it is the same as that used by Dick Roberts? If not, kindly correct it.—Alfred L. Megill, 761 Atlantic Ave., Brooklyn, N. Y.

Your circuit is identical with the one used by Dick Roberts. The circuit as supplied by the writer mentioned appeared in RADIO WORLD, August 18.

* * *

Can I use the variocoupler described by Arthur S. Gordon in RADIO WORLD, March 3, in the improved Turnbull receiver, described in RADIO WORLD, July 14? Can this set be used with outside antenna without changes?—W. H. Moreloun, Thomaston, Conn.

This set is designed for use with a loop, and if you desire the same circuit designed for antenna and ground, see article by the same author in RADIO WORLD, May 19. You can use the coupler mentioned in these circuits if it is carefully constructed.

* * *

Kindly advise me of a good circuit to use for the reception of distant signals. I am fairly well versed in radio, but as yet have only constructed the Rheinartz. Can you furnish panel layouts? Do you advise the Zenith circuit?—Henry Bergstedt, 6607 S. State Street, Chicago, Ill.

It is a very difficult matter to prescribe any particular circuit for the purpose you mention. Unless you wish to use more than two tubes, the Rheinartz is about as good as any. We do not furnish panel layouts. We cannot at the present time publish the circuit you mention.

* * *

In the article by D. S. Brown what is meant by "basket weave coupler?" He recommends exactly 63 1-3 turns on the rotor. Is it absolutely necessary to have that many?—Karl Dunlap, Kimmundy, Ill.

The basket weave coupler is made with small round uprights placed in the form of a circle instead of a tube. The wire is woven in and out of these. This lessens the distributed capacity. The mention of 63 1-3 turns was made as a little joke instead of a correct technical description. Wind it full of wire—whether there are 62 or 65 or 70 turns will not matter very much.

* * *

I have a two stage amplifier which worked fine last winter on 90 volts, but when the B batteries fell to 60 it would not work on the second step. After rewiring the amplifier, it does not work on 90 volts, but will on 45, and the second step is no louder than the first. My tubes are UV201 and have seen six months of good service and both work well as detectors with but 24 volts on the plate. How can I remedy my trouble?—Gene Ullemeyer, 1511 9th Ave., Rock Island, Ill.

Make sure that one side of your secondary amplifier transformer lead goes to the negative side of the A battery. Test out your transformer. There is a possibility that it is burnt out and you are getting return through some induction in the lines. This has been found to happen very often after months of operation, when the second stage suddenly lays down. Make sure of your connections before you get discouraged. Examine the nips of your tubes to see that they are all making perfect connection with the lugs on the socket. The little solder tip

sometimes falls off, or wears off, and does not make good connection. See that it is not corroded and therefore making bad contact. Polish them by means of a very light rubbing with emery cloth.

* * *

In RADIO WORLD, August 4, you published an article by A. D. Turnbull. Is this circuit adaptable to a six volt tube operated by a storage battery? If so, what are the constants of the circuit with especial reference as to whether or not the tube is a detector or amplifier, the voltage of the B battery, size of grid leak? Is a vernier rheostat essential? How is panel shielding most effectively and cheaply accomplished?—Harold W. Crockett, 2624 Channing Way, Berkeley, California.

This circuit is adaptable to a 6 volt tube simply by using a suitable socket instead of the dry cell socket. The constants remain the same in all cases, with the possible exception of the grid leak, which should be variable in order to determine what is the best value for the particular tube you are using. A vernier rheostat is not absolutely essential, but it is extremely helpful. Shielding a panel is best accomplished after the panel is completely drilled. Lightly sandpaper the rear surface, rotating the paper in circles instead of straight. Give it a good coat of thin orange shellac, and let it dry partially until it is very sticky. Then cover the back of the panel with tin foil, pressing it on firmly and smoothly by means of a roller. Allow to dry 24 hours in a cool place, and then with a sharp knife cut away circles in the spots where your holes are drilled. When the set is constructed, ground the shielding to the ground post of the set.

* * *

I am learning the code by using a Ford spark coil connected across the antenna and ground by means of a spark gap. A 6 volt storage battery is used to supply current for the operation. I wish to know if this is transmitting. Could I cause any disturbance to local stations by so doing? I do not have a license. Where can I get information on the necessary knowledge to enable me to obtain a license?—Kent Deckard, P. O. Box 3, Rusk, Texas.

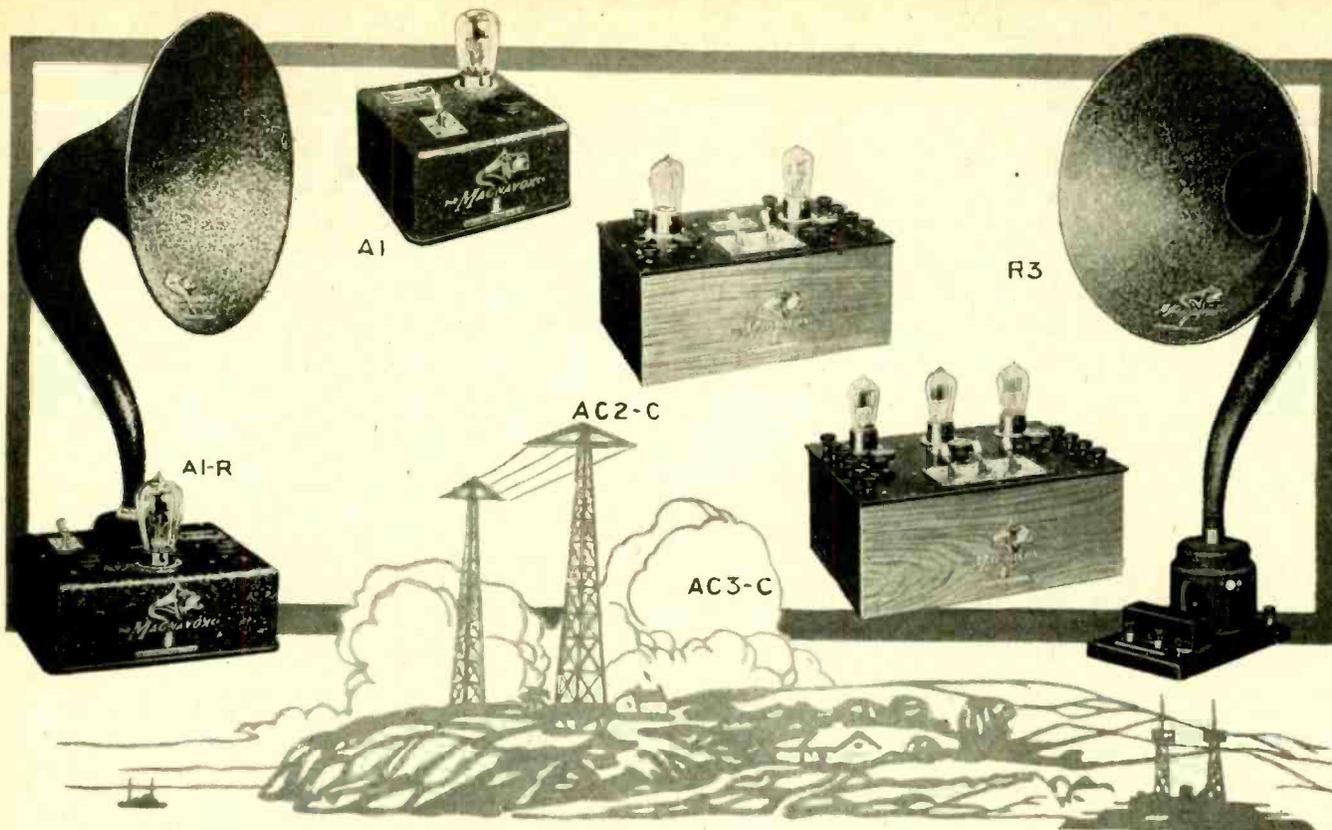
You are transmitting. Furthermore, you are using an untuned transmitter which is capable of radiating a very broad wave and creating a great deal of disturbance. The best manner of learning the code is by means of a key, dry cell and buzzer. It does not have to be connected to the antenna. If you continue you will get in trouble with the government, so stop it until you can obtain a license.

In order to get an amateur license you must be able to send and receive at least 10 words per minute (five characters constitute a word, so 50 characters per minute is necessary). You must have a knowledge of the international radio laws pertaining to the secrecy of messages, the operation of a station during distress calls, the international abbreviations. You must also be able to draw diagrams of your receiver and proposed transmitter, and have a knowledge of the working of both. You must know your transmitting input and output and be able to answer questions on simple electricity. For further information write to the Department of Commerce, Radio Division, Washington, D. C. The radio inspector in your district is located at New Orleans, La. Apply to him for information and stop transmitting until you obtain a license.

* * *

Can I add a one or two stage amplifier to the dry cell circuit of A. D. Turnbull, published in RADIO WORLD, August 4?—Henry Conn, Boonton, N. J.

You can do this. A suitable circuit for your purpose appeared in RADIO WORLD, August 18, page 20.



New Magnavox Combination Set

A2-R Insures convenient and perfect Radio reproduction. Consists of Magnavox Reproducer with 14-inch horn and 2-stage Magnavox Power Amplifier, as illustrated \$85.00

Radio takes another step forward with these wonderful new Magnavox devices

THE new Magnavox models here shown extend and supplement the already famous Magnavox line of Reproducers and Power Amplifiers. There is a Magnavox for every receiving set.

Magnavox Reproducers

- R2 with 18-inch curvex horn in new acoustic finish . . . \$60.00
- R3 with 14-inch curvex horn in new acoustic finish . . . 35.00
- M1 new Magnavox Reproducer requires no battery for the field, thus meeting requirements of dry battery receiving sets. With 14-inch curvex horn in new acoustic finish . . . 35.00

Magnavox Combination Sets

- A1-R consisting of Magnavox R3 Reproducer with 14-in. horn and 1-stage Magnavox Power Amplifier . . . 59.00
- A2-R consisting of Magnavox R3 Reproducer with 14-in. horn and 2-stage Magnavox Power Amplifier . . . 85.00
- A1-M same as A1-R but with the new Magnavox Reproducer M1 . . . 59.00

A2-M same as A2-R but with the new Magnavox Reproducer M1 . . . \$85.00

Magnavox Power Amplifiers

- A1 meets the demand for a 1-stage Power Amplifier. Special finish metal case. . . 27.50
- AC-2-C Magnavox 2-stage Power Amplifier with Bakelite panel in highly finished hardwood case . . . 55.00
- AC-3-C Magnavox 3-stage Power Amplifier . . . 75.00

Ask your dealer for a demonstration. Interesting booklet will be sent on request.

The Magnavox Company
 OAKLAND, CALIFORNIA
 370 Seventh Avenue, New York
 World pioneers in the development and manufacture of sound amplifying apparatus

MAGNAVOX PRODUCTS

Magnavox Reproducers and Amplifiers

"Saving money by NOT advertising gives the sheriff and auctioneer most of their business."—F. S. C.

Radio Merchandising

Advertising Rates: Display, \$5.00 an inch, \$150.00 a page. Classified Quick-Action Advertising, 5 cents a word.

Telephone Bryant 4798

The Second Annual National Radio Week

Almost a year has passed since the inauguration last fall of RADIO WORLD'S suggestion of National Radio Week.

The intention of everybody this year is to make the Second Annual Radio Week more important in every way than the initial event.

This is not a one paper or a one man idea. It is altogether too big and too good for that. Everybody last year joined hands with everybody else, and the result was worth while.

Let's join together once more and do our utmost to make the Second Annual Radio Week bigger and better than ever.

Have you any ideas? Send them in.—Editor, RADIO WORLD.

Mayor Moore Strong for Municipal Radio

EDITOR, RADIO WORLD: A municipally owned and operated radio broadcasting station would appear to be a future requirement of every large city. It presents unlimited capacity for the apprehension of criminals, to warn the citizens in the event of conflagrations, disasters, and to inform residents of the latest schemes of sneak thieves, confidence men, and others who prey upon the public.

The radio of the future will unquestionably enter into official municipal activity, and will, no doubt, in a relatively short time take its place among all progressive discoveries and inventions in its service to the citizens.

Very truly yours,

J. HAMPTON MOORE,

Philadelphia, Mayor.

Information for RCA Dealers

PIERRE BOUCHERON, advertising and publicity manager of the Radio Corporation of America, is making a thorough tour of the Mid-West where he is visiting the leading RCA jobbers and dealers in an endeavor to secure a cross-section of opinions and views on the radio trade tendency in that territory. Mr. Boucheron is particularly interested, while on this trip, in conducting research in the Mid-West territory for the guidance of the Radio Corporation in its future relations with the trade.

The results of these observations he will incorporate in a free course to radio dealers, to be known as "How to Sell Radiolas." The object of the course will be to bring to their attention the three fundamental ideas behind successful retailing activities and to suggest applications of these fundamentals that will be useful to the dealer and jobber in selling Radiolas. These ideas will include advertising, demonstrating and service.

It is believed the radio trade will find this information highly valuable in the conduct of their work when the data is made available in handbook form.

The Way Sol Kahan Does It Other Newsdealers Can Do the Same Thing

Sol Kahan keeps a prosperous news, stationery and cigar store at 305 North Avenue, New Rochelle, N. Y. He sells a great many RADIO WORLDS in the course of a month. We noticed recently that Mr. Kahan had two unsold copies of RADIO WORLD of August 11 on his stand. A few days later he was asked if these copies had been returned to the American News Company, and he replied, "No. I keep my back numbers of RADIO WORLD in stock and sell them out, sometimes quite a while after their dates. I find there is a good demand for back numbers. In this way I always sell out my full supply of RADIO WORLD."

Here is a tip worth following by other newsdealers.

Radio Trade Notes

The Offenbach Electric Co., 1452 Market Street, San Francisco, Cal., is interested in push and pull transformers.

* * *

Clayton Lord, Box 152, Wrightsville, Ga., is starting a retail radio business.

* * *

Globe Radio Supply Co., P. O. Box 23, Dorchester, Mass., is in the market for radio parts.

* * *

Lake County Overland Co., Leesburg, Florida, is installing a radio department.

* * *

George C. Blackwood, 243 East Upsol St., Mt. Airy, Philadelphia, Pa., is in the market for hinged lid cabinets.

* * *

Samuel W. Chapman, proprietor of The Electric Shop, Cortland, N. Y., has filed a petition, with liabilities of nearly \$10,000 and assets of \$3,950, with creditors principally in New York City.

Classical Jazz Via Radio

A NEW development in music that has been stirring up a great deal of talk lately, not only in musical circles, but with the general public, has taken place. The persons responsible for this latest innovation are Francis Loubet, musical director and bandmaster, and his manager, Max Brav, both very well known to the music world. According to a recent canvass of the radio broadcasting stations, the most popular music proved to be grand opera and typical American "jazz," and these gentlemen have hit upon the novel idea of combining both. In other words, we will now be able to listen to a pot-pourri from "Aida" or "Carmen," or one of Tchaikowsky's famous compositions arranged in "jazz" form, without in any manner detracting from the value of these masterpieces. This new idea is expected to prove a fitting form of musical entertainment for the most critical student as well as the modern dance enthusiast.

Radio Literature Wanted

Manufacturers of and dealers in radio apparatus and accessories are notified that literature and catalogues describing their products have been requested, through the Service Editor of RADIO WORLD, by the following:

Carey's Repair Shop, R. R. No. 3, Galveston, Indiana. (Dealer.)

H. H. Gardner, 63 Clark St., Malden, Mass.

Alva D. Kerr, Oakland, Maine.

Richard Bladel, 1522 Ninth Ave., Rock Island, Ill.

Leland Schermerhorn, Radio Operator, S. S. "Wm. T. Roberts," Marine P. O., Detroit, Mich. (Assembles receiving sets.)

Fred A. Mulligan, Rosser, Manitoba, Canada.

Frank Gabriel, 181 Elizabeth St., West New Brighton, Staten Island, N. Y. (Repairs and installs radio sets.)

Lewis Radio Shop, 43 Columbia Ave., Passaic, N. J.

Edwin A. Jenkins, radiotrician, Box 10, Station S, Brooklyn, N. Y.

Clifford McFaul, Lachute Mills, Quebec, Canada. (Retailer.)

Robert Wakefield, 2063 East 82nd St., Cleveland, Ohio.

Walter A. Ladwig, Seneca, Kansas. (Dealer.)

Offenbach Electric Co., 1452 Market St., San Francisco, Cal. (Retailers.)

J. P. Enead, 629 South Eighth St., Paducah, Ky. (Retailer. Interested in battery chargers.)

Howard P. Sharts, 95 Kingston Ave., Brooklyn, N. Y.

Willard Watts, 1831 Idlewood Ave., East Cleveland, Ohio.

J. R. Griffiths, Route 6, Box 65, Jacksonville, Florida. (Is building several sets for sale.)

Stockton Electric Shop, G. A. Fleck, Stockton, Kansas.

Louis Brettschneider, 488 Bradford St., Brooklyn, N. Y.

Clayton Lord, Box 152, Wrightsville, Ga. (Retailer.)

Globe Radio Supply Co., P. O. Box 23, Dorchester, Mass.

Rodolfo Rodriguez, 309 South Albany Ave., Tampa, Florida.

A. E. Lyerly, 207½ Main Street, Fort Worth, Texas.

Alfred B. Anderson, Proctor, Vermont.

H. P. Osterhout, General Delivery, Utica, N. Y. (Interested in A. F. and R. F. transformers.)

Square Deal Radio & Electric Co., Box 558, Fenton, Mich.

Coming Events

AMERICAN RADIO EXPOSITION, Grand Central Palace, New York City, October 6 to 13, 1923. J. C. Johnson, general manager.

ANNUAL HOME AND CITY BEAUTIFUL EXPOSITION, featuring radio exhibits. Atlantic City, N. J., June 16 to September 8, 1923.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, Pacific Coast convention, Del Monte, Cal., Oct. 2-5. F. L. Hutchinson, 33 West 39th St., New York.

A MERICAN RADIO RELAY LEAGUE, second national convention, Chicago, Ill., September 12-15, 1923. Chicago Radio Traffic Association, 959 The Rookery, Chicago, Ill.

Fake Phone Maker Enjoined

C. BRANDES, Inc., 237 Lafayette St., New York City, has secured from Vice Chancellor John Bently, of Jersey City, N. J., an injunction restraining the Holley Manufacturing Company, of Jersey City, from making radio headsets purporting to be the "Superior" brand which is a trademark of C. Brandes, Inc.

Radio Press Dinner and Get-together Jollification at the Hotel Pennsylvania

REPRESENTATIVES of radio and various other papers gathered at the Hotel Pennsylvania, New York City, on Wednesday evening, August 22, for the purpose of welcoming Benjamin J. Cohon into the radio fold. This event was planned by Philip Wolf and Harry Saunders, of Philip Wolf, Inc., advertising agents for Rova, and who brought together these representatives on the occasion of Mr. Cohon's joining the Rova concern. Mr. Cohon, who lives in Westwood, N. J., is a noted organizer, having for several years aided in the building up of the successful and far-reaching policy of the United Cigar Stores under the able leadership of Edward Wise. Mr. Cohon, who is now vice-president of the Rova Products Corporation, becomes so for the purpose of stabilizing radio merchandising activities in the metropolitan area.

Besides an excellent dinner, served more or less in accordance with the novel menu card reprinted herewith, there were several impromptu talks, including an interesting one by Mr. Cohon.

Frank Tinney, the noted comedian, was among those present. During his remarks Tinney said that one night after his wife had gone to bed he tried for DX, but that all he got was "Hell." Mrs. Tinney, who also was among those present, assisted in entertaining the guests in her clever way.

Mr. Tinney's remarks, as well as the addresses by the others who spoke, were broadcast by WJZ.

Those in attendance were: Mail, Stuart Rogers, F. F. Humphreys; Sun-Globe, E. L. Bragdon, F. C. Ehlert; Tribune, Jack Binns; Times, O. E. Dunlap, Jr.; Brooklyn Eagle, E. M. Applegit; Radio Dealer, L. A. Nixon, N. B. Zimmerman; Radio News, S. Gernsback, R. W. Demott; RADIO WORLD, F. S. Clark; Wireless Age, H. L. Welker; Radio Retailer, A. H. MacAttamanay; Radio Broadcast, A. H. Lynch; Radio Record, A. Borras; Phonograph Weekly, Sidney Davis, M. Kennedy; C. B. Pounce, Broadcasting Director R. C. A.; Frank Tinney, the comedian; Frank H. Shevit, N. Y. American Tax Expert; B. J. Cohon, Vice-President Rova; Mrs. Frank Tinney; Mrs. Goldman, Rova; Philip Wolf, Harry Saunders, Philip Wolf, Inc., Adv. Agents for Rova; Henry Anchester, President Greeley-Madison; Sonny Brakas, Leo Fried, Rova; Ralph Rubenstein, Rova.

Testimonial to

Mr. B. J. Cohon and Radio Press
by

R-O-V-A Radio Products Corporation
MENU

Sea Food Cocktail la Grebe
Gumbo en Reflex
Super Celery Olives Magna-Vox
Regeneration La Volstead
Broiled Bluefish a la Armstrong
Tuned Potatoes Variable
Aerial Sweetbread, Marconi
Green Corn Grounded
De Forest Duckling, Apple Sauce Rova
Salad Cockaday
Vltch 45 Volt Gingenale 2,000 Ohms
Non-Static Ice Cream
RCA Cake
Cafe

Radio Cigars
Audio Cigarettes

Hotel Pennsylvania
August 22, 1923

Technically Out of Bounds

Madge—You should have your hair bobbed again.

Marjorie—I guess you're right, dear. My wave lengths are getting too long.—
New York Sun.

Advertising Vigilance Committee Rules Against Storage Battery Advertiser

THE Radio Dry Storage Battery Company, of Chicago, has advertised its "Radio Dry Storage Battery" as—

"OUR GUARANTEE. Each RADIO DRY STORAGE BATTERY carries with it a THREE-YEAR UNCONDITIONAL GUARANTEE, on adjustment basis."

The guarantee has been further described and referred to in the company's advertising as—

"EXIT REPAIR BILLS. Our strong GUARANTEE eliminates repair bills entirely, giving the consumer a new battery at once if anything goes wrong with his battery."

"Backed by an Iron-Clad Three-Year Written Guarantee."

"It is guaranteed under an unconditional three-year guarantee."

The above phraseology would lead a prospective purchaser to believe that a battery procured from this manufacturer bore an unconditional guarantee for three years, and that should the battery require

replacement or repair, within the period stated, he might expect same free.

The guarantee which the company actually gives is this: If the battery has been used for ninety days or less, it is replaced free of charge, but if it has been used for over ninety days, it is replaced only on payment of an "adjustment," computed at the rate of 2 cents per day. In reality, the battery is unconditionally guaranteed for ninety days; it is thereafter guaranteed on an adjustment or conditional basis, contingent upon the payment of a service charge. Advertised as an "unconditional guarantee" and as entirely eliminating repair bills, replacement under these conditions could occasion an expense of \$10, \$15, or even \$20 or more.

In view of the discrepancies between the advertised guarantee and the guarantee really given, the National Vigilance Committee is of the opinion that this advertiser's copy is decidedly misleading, and cannot recommend it.—*Advertising Club News.*

Managers and Music Publishers Stop Fighting Radio—Now Utilize Its Advantages

RADIO is rapidly battering down many prejudices. It is not so long ago that theatrical managers and music publishers would have nothing to do with radio or at least they refused to join hands with it in any endeavor to entertain the public. RADIO WORLD announced recently that Marcus Loew had taken over the WHN station and installed it in his State Theatre Building on Times Square, New York City. Now along come the music publishers including E. C. Mills, head of the Music Publishers Protective Association, with a special event the chief items of which were broadcast by Station WJZ. In other words, managers, music publishers and others are taking the stand that so long as radio is too strong to fight they might just as well avail themselves of its advantages.

Paul Specht, orchestra leader, and the members of his band, who have just re-

turned from a successful musical invasion of England, were tendered a reception and dinner by their friends in the musical profession at the National Vaudeville Artists Clubhouse, New York, last Monday evening. This is the best equipped and most beautiful theatrical clubhouse in the world.

Theatrical folk and others all over the country who were not able to be present listened in on radio and sent congratulatory telegrams saying that they approved of everything that was going on and wished to be there.

E. F. Albee, head of the B. F. Keith Circuit, sent a congratulatory letter to Mr. Specht and his men. C. E. Mills was master of ceremonies and Jack Bliss acted as toastmaster. Many prominent musicians, civic officials and members of the theatrical profession were present. Specht was given a diamond and pearl set of studs as a token of esteem.

New Radio and Electric Firms

Speedee Specialty Co., New York City, radio and electric machines, \$5,000; H. and R. A. Dejur. (Attorney, H. Levin, 15 Park Row.)

Twin-Boro Electrical Service Co., Brooklyn, N. Y., \$5,000; N. and L. A. and A. M. Goldberg. (Attorney, J. G. M. Browne, 280 Broadway.)

Maritime Electric Co., New York City, contractors, \$20,000; J. J. and H. T. Gill, J. J. Tyson. (Attorney, J. A. O'Brien, 1402 Broadway.)

Interboro Radio Corp., New York City, make instruments, \$10,000; L. Israel, M. Salpeter, D. I. Goldstein. (Attorneys, Cohen & Goldfarb, 302 Broadway.)

H. J. Siebert, Manhattan, electrical and engineering work, \$50,000; C. C. and H. J.

Siebert, E. Holzer. (Attorneys, Feldman, Streicker & Goldman, 154 Nassau St., New York City.)

American Battery Specialty Co., \$250,000; H. Lindale Smith, M. L. Merchant, C. H. Patterson, Cleveland, Ohio. (Attorney, Homer J. Smith, Wyoming, Del.)

Niagara Electric Supply Company, Niagara Falls, N. Y., \$20,000; F. C. and S. C. Wisbaum, M. Rabin. (Attorneys, Moore & Killian, Niagara Falls.)

Link Hemrick, New York City, make batteries, \$10,000; C. W. Link, H. Hemrick. (Attorney, S. Brinn, 63 Park Row.)

Fixturellor Corp., New York City, electrical supplies, \$20,000; M. Schimel, A. King, A. Waiss. (Attorneys, Drechler, Orenstein & Leff, 225 Fifth Ave.)



ON APPROVAL FOR 30 ¢
 ZOBEL-STEIN LABORATORIES
 322 9TH ST. BROOKLYN, N.Y. SOUTH 2650

**WD-11 and WD-12
 TUBES REPAIRED**

WD-11 or WD-12	\$3.50
C-300 or UV-200	3.75
C-301 or UV-201	3.00
C-302 or UV-202	3.50
C-301A or UV-201A	3.50
Moorehead Detectors	2.75
Moorehead Amplifiers	3.00
DV-6 or DV-6A	3.50
Also the new UV-199	3.50

All tubes guaranteed to work like new.
 Mail Orders Given Prompt Attention
 "24 Hour Service"
 NEW DX 1 1/2 VOLT TUBES..... \$4.00
RADIO TUBE CORP.
 55 Halsey Street Newark, N. J.
 TUBES SENT PARCEL POST, C. O. D.

**National Association of
 Broadcasters Supplies
 Members with Music**

L. BAMBERGER & COMPANY, Newark, N. J., owners and operators of Station WOR, have announced that they will appeal to the United States Supreme Court the decision handed down against them recently by Judge Lynch. As announced in RADIO WORLD last week, this was in the case of M. Witmark & Sons, music publishers of New York City, against the Bamberger firm for broadcasting copyrighted music. Judge Lynch decided that such use of the music violated the copyright law and he naturally expects to be sustained by the Supreme Court. As far as broadcasters are concerned they are confronted by the Judge Lynch decision, which plainly states in effect, that they cannot broadcast the music of the American Society of Composers, Authors and Publishers, without taking out a license.

Now, what have the broadcasters themselves done to meet this situation? A meeting was called at the Drake Hotel, Chicago, on April 25 and 26, 1923, which was attended by most of the prominent

broadcasters in the United States, as noted in RADIO WORLD at the time. The general manager of the American Society of Composers, Authors and Publishers, came from New York and addressed the meeting. His proposals, however, made a decidedly unfavorable impression upon the men assembled, and it was therefore decided to form the National Association of Broadcasters. Counsel was retained. Paul B. Klugh took active charge of the affairs of the association, with the title of executive chairman. Offices were established in New York and plans were put into operation for placing the new organization upon a practical operating basis. A fund was provided adequate to meet all financial requirements for a period of years and a constitution and by-laws were adopted containing the following purposes:

To foster and promote the development of the art of radio broadcasting and the interests of those engaged in any business, profession or industry relating or pertaining to radio broadcasting; to reform abuses relative thereto; to secure freedom to its members from unjust and unlawful exactions; to procure uniformity, equity and certainty in customs and usages of trade and commerce relating thereto; to settle differences between the members, and to promote a more enlarged and friendly intercourse between members; to secure co-operative action in advancing the common welfare of its members and proper consideration and concentration of opinion upon questions relating thereto; to advocate the enactment of just and equitable laws pertaining to or affecting radio; to support every movement to advance the radio art, and to encourage and aid in the development of musical and literary genius, especially where such genius has not had proper recognition.

Among other activities, a Bureau on Music Release was established. It is headed by Raymond Walker, an experienced song writer and publisher, who has a corps of skilled and able assistants. This bureau has invited song writers and publishers to send their music to the executive offices through display advertising in periodicals read by song writers, announcements by members over the air and thousands of letters sent out. As a result several thousand musical compositions have been received of varying degrees of merit. These are all put through systematic tests—less than 10 per cent. have been found acceptable—but where a song bears evidence of becoming a so-called "hit" and has clean lyrics, it is released by the National Association of Broadcasters.

Since July 1, this music service has been going out to members of the national association. The music is of a great variety, and, in the opinion of many, of a better quality than that controlled by the American Society.

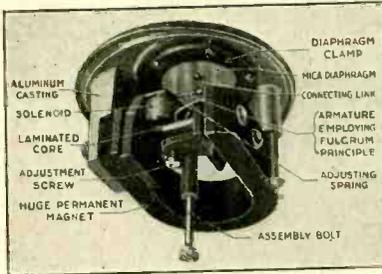
Members of the National Association of Broadcasters, therefore, are not worried about the Judge Lynch decision. They are not even interested in it, because they are receiving an ample supply of good music which permanently frees them from any demands similar to those so unjustly made by the avaricious American Society of Composers, Authors and Publishers.

THE TRINITY LOUD SPEAKER



TYPE "A1"
 21" FIBER
 HORN
 \$25.00

TYPE "B"
 (For Phonographs)
 \$12.50



INTERIOR CONSTRUCTION

An ear phone is an ear phone no matter how fancy the horn that covers it may be, and, due to the delicate construction of an ear phone it is utterly incapable of giving true tone reproduction, especially, when relatively large currents are passed thru its coils, such as the output of a two-stage or power amplifier.

The Trinity Loud Speaker element embodies the well-proven and tested principles of the phonograph reproducer with the soundest principles of electromagnetic design best adapted for loud speaker operation. It is not an ear phone when placed on a head band and a loud speaker when covered with a horn. It is a sturdy loud-speaking element ALWAYS.

Send for Literature.

TRINITY RADIO CORPORATION

446 TREMONT STREET, BOSTON, MASS.

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

1493 Broadway, New York City

Please send me RADIO WORLD for months, for which

please find enclosed \$.....

SUBSCRIPTION RATES:

Single Copy	.....\$ .15
Three Months	..... 1.50
Six Months	..... 3.00
One Year, 52 Issues	..... 6.00
Add \$1.00 a Year to Foreign Postage; 50c for Canadian Postage.	.....

Aid for Canadian Radio
 GOVERNMENT aid to the extent of \$55,000 has been extended in Canada for the purpose of establishing radio stations at McMurray, at the end of the railroad in Northern Alberta; Fort Simpson, on the MacKenzie River; and Dawson, in the Yukon, according to reports just received at the Department of Commerce. The new stations will displace the land lines at present in use from McMurray northward, for which the Canadian Government has appropriated from \$275,000 to \$300,000 annually for the past 23 years.

The Wireless Oracle Speaks

By Hirsch M. Kaplan

Irene Owens, who sang through station WOR, has a voice like a nightingale.

WDAR comes through at all hours these days. Your programs sure are the cat's pajamas. Keep it up!

Fine stuff, WAAM! You sure have some of the larger stations beaten.

See where "M. T. G." (the gentlemen who won't divulge his name) announcer at WHN, is copying your style, Roxy. Never mind though—you're still miles ahead of your closest competitor.

Edward Yap sure can "Say it with a ukulele."

Now that you've come under new ownership, WBS, let's hope that there will be an improvement in your station.

Say WHN, when you were over in Ridgewood, as our Dr. Coue would say, "Day by day in every way you were getting better and better." Now, in your new home, although your volume is good, your modulation is terrible. Too bad, as the programs you are offering leave a poor impression.

Mustn't forget our ever ready friend, Fred Bendell, sporting editor of the Newark "Sunday Ledger." Your talks, I can safely say, are enjoyed by all.

KDKA broke through with the 100 per cent. Westinghouse Band, which sure was the bee's knees.

WDT, you may be trying your darndest, but, as Rube Goldberg of the Evening Mail says, "It don't mean anything." We B. C. L.'s are from Missouri and we've got to be shown.

WSB came through with a 75 per cent. Radiowl Concert.

Gdubb, the sax player of the Lucky Strike Operators, certainly can blow some very peppy songs through his instrument.

Robert and Merrill Pollock are some jazz songsters. Did you hear them from WJZ the other night?

Have you ever tuned for a DX station just when the time signals are being transmitted by the various stations. then suddenly you stop on hearing sounds like that of a clock, thinking that you had station PWX of Cuba, only to listen patiently for the announcer and then hear him say, "This is station WHAS?"

Suppose you've all forgotten by this time that there ever was a station WJY? Well, just let me remind you that this station is still on the air every Sunday afternoon from 2.30 to 6.30.

Miss Leonia Adams sure is a "second best" to Alma Gluck. That's saying something!

The radio musical fans' delight—the New York Philharmonic Concert Orchestra and Franko Goldman Band. What say you, lovers of good music?

Dave Saperstein certainly can tickle the ivories and, as Roxy would say, "Bravo!"

Did you hear the reception given Paul

Whiteman on his return from a London engagement? There were at least five orchestras and three popular male singers. They sure were some Jazz Boys. To put the finishing touches to the ceremonies Paul was crowned Jazz King.

If you didn't tune in WHAZ the other night and hear the nine-year-old Beatrice Gilbert tickle the ivories then you missed a treat. Another prodigy!

Suggest that Earl Dana do a few hours "mike" practice before he broadcasts again. Although an excellent literary critic, his style of delivery over the radio leaves much to be desired.

The First Baptist Church of Worcester, Mass., will be on the air shortly with "This is station WBAK, 252 meters."

When it comes to bedtime stories and such, there are few stations that can beat WIP's "Uncle Wip." Somehow or other he sounds convincing, and that's the quality which is lacking in most sandmen.

Army Radio Service Pays

THE army radio net, valued at approximately \$500,000, made a return to the Government of over 10 per cent. during the past fiscal year, on paper. From June 30, 1922, to July 1, 1923, the traffic handled by the Signal Corps radio net would have cost the Government \$66,375 at government rates, via commercial wires. The actual cost of these operations was \$13,840, which shows a paper saving of \$52,535. Actually official messages are handled without cost, and the few private and commercial messages handled, where other radio service is not available, is charged for at slightly over commercial rates, the money being turned over to the Treasury of the United States.

During the fiscal year ended July, 120,968 official messages were handled by the Army's Message Center in the Munitions Building in Washington, D. C.

In the army's radio net there are today thirteen main stations, 43 corps area stations and 12 air service or flying field stations, making 68 principal stations. In addition, there are auxiliary stations which bring the number to 112 radio stations.

LAUGH at Your LANDLORD

If he refuses to allow the construction of an aerial. The LEVIN "NO-AERIAL" RECEIVER solves the problem in an economical way. Just connect your Levin "No-Aerial" receiver to the water pipe or radiator and listen in. This receiver requires ONLY a ground connection for perfect reception. Send stamp for further information or \$1.00 for plans and specifications, including full-size panel layouts and instructions.

RADIO EQUIPMENT COMPANY

727 W. 8th St. JUNCTION CITY, KANSAS

Do You Want LONG DISTANCE on Your Set?

The following stations have been heard with a COAST COUPLER

- WDAP—Chicago
- CFCN—Calgary
- WWJ—Detroit
- PWX—Havana
- WSB—Atlanta

And Many More



The COAST COUPLER is a necessary part of your radio hook up. Manufactured of the best materials obtainable and thoroughly tested before leaving the factory, it has immediately won recognition in the radio market.

ANYWHERE IN THE UNITED STATES—\$5.00

Dealers and Jobbers Investigate

COAST COUPLER COMPANY

245 EAST SEVENTH STREET

LONG BEACH, CALIFORNIA

RADIO WORLD IN THE PUBLIC LIBRARIES

Many public libraries throughout the country are sending in their subscription orders for RADIO WORLD.

Librarians evidently have made up their minds that the visitors to their libraries are anxious to read articles about and see pictures of the latest developments in radio when they are news.

If your library has not placed RADIO WORLD on file, tell your local librarian how interesting and important is this once-every-seven-day radio paper.

Address: RADIO WORLD, 1493 Broadway, New York, N. Y.

Tune in the world with a CROSLLEY Model XJ



Sebring, Fla., heard Honolulu. A man writing from Nassau, British West Indies, says, "First of all on Friday night last June 29, 1923, I heard Honolulu." These records were made with a Crosley Model X. Thousands of letters have come to us unsolicited, telling of the wonderful performance of this instrument.

The new Model X-J, combining all the features of the Model X, with greater refinement of detail, is even better. It is a 4-tube set incorporating one stage of tuned radio frequency amplification, detector and two stages of audio frequency amplification with jack to plug in on three tubes for head phones, new Crosley multistat, universal thermostats for all makes of tubes, new condenser with molded plates, filament switch and other added features. We believe the Crosley Model X-J to be the most efficient radio receiver ever offered to the public regardless of price. Write to-day for free catalog describing the Model X-J and other Crosley receivers and parts.

For Sale by Good Dealers Everywhere.

Crosley Mfg. Co.
9401 Alfred Street
Cincinnati, Ohio



SEND THIS COUPON

Crosley Manufacturing Co., 9401-9403 Alfred St., Cincinnati, Ohio.

Gentlemen: Please send free of charge your complete catalog, together with your booklet entitled "The Simplicity of Radio."

Name

Address

FOR RELIABLE UP-TO-DATE RADIO MAILING LISTS

Use Our Card Catalog Directory in use now with over 200

Radio Manufacturers and Jobbers

Your ENVELOPES ADDRESSED

At \$2.00 per 1,000

Write for Particulars

Sydell's Radio Trade Directory

406 W. 31st St., New York. Watkins 5987

WOULD YOU LIKE TO RECEIVE RADIO LITERATURE? Are you in the market for radio goods of any kind, either as a consumer, a distributor or a retailer? If so, send us your name and address on a post card and we will see that your name reaches the right people so that you will receive pamphlets, circulars, etc., regarding the goods you want. Address SERVICE EDITOR, RADIO WORLD, 1493 Broadway, New York City.

The Potentiometer Did the Trick

EDITOR, RADIO WORLD: I have noticed in several of your past issues that your writers have made particular note of potentiometers in the circuit. I recently constructed a two-stage radio-frequency set from a plan submitted by a local "radio expert." I have had rather indifferent success with it, as one night it would seem to work right and other nights it would not work satisfactorily at all.

I noted that most all the circuits in RADIO WORLD using radio-frequency amplification also used a potentiometer. I pondered over this for some time and finally installed one. It was a simple job, and not as hard as I had expected. I must say that I have improved my set by its use.

As an illustration, I used to get WLW just faintly readable at times, while at other times it was fairly strong. Since I have installed the potentiometer I have been able to bring in that station, as well as many others fine and without the tubes seeming to "jam."

I want to thank you for your advice in the matter, even though I am not a believer in "do-dads" in a receiver.

Hope anybody who has trouble in using radio-frequency amplification will be helped by my experience. I said that it was greatly improved. In thinking it over, I believe that an improvement value of 100 per cent. will not be an exaggeration.

Yours truly,
Ridgewood, N. Y. JAMES MORTON.

Bureau of Standards Reports on Amplification Measurements

MEASUREMENTS of voltage amplifications of audio-frequency amplifiers are discussed in Letter Circular 98, which has just been issued by the Bureau of Standards for free distribution. This circular gives the results of voltage amplification measurements made on 16 audio-frequency amplifiers which were on the market during 1921-22. All these amplifiers employed transformer coupling. Measurements were made over a frequency range of 400 to 2100 cycles per second. The amplifiers studied are referred to by arbitrary reference numbers rather than by a statement of the manufacturers' names and model number, the method followed being the same as that used in measuring the voltage amplification of amplifiers, the subject of Letter Circular 86.

It is believed that the examples given in this report will be of assistance to manufacturers in testing and describing their own products and will thus lead to their improvement.

Government Radio Directory Out Soon

LISTS of broadcasting, amateur, Government and ship and land commercial stations have been prepared and transmitted to the government printer for use in the forthcoming directory of stations, which will be available in about six weeks.

These lists are issued annually, giving all stations in service at the beginning of the fiscal year, on July 1. Two books are issued—one covering commercial, Government and broadcasting stations and the other amateur and special stations. Each station is listed twice, by name of owner and by call, and the lists are arranged by districts, in the case of amateur and special stations, and alphabetically in the case of all other stations.

Announcement will be made in these columns when the lists are ready for distribution.

**EXTENDED FOR 20 DAYS
EXTRAORDINARY SUMMER
SUBSCRIPTION OFFER**

**Radio World and Other Popular Radio
Publications for the Price of Subscription
for Radio World Alone**

- Radio World has made arrangements
- by which it is possible
- to offer a year's subscription for
- any one of the following publications
- with one year's subscription for
- Radio World:
- RADIO NEWS or
- POPULAR RADIO or
- WIRELESS AGE or
- RADIO DEALER or
- RADIO (San Francisco)

- This is the way to get two publications
- for the price of one:
- Send \$6.00 today for Radio World
- for one year (regular price
- for 52 numbers)
- and select any one of the other
- four publications for twelve months—
- Add \$1.00 a year extra for
- Canadian or Foreign postage.
- This offer good only up to and
- including September 20, 1923.
- Present Radio World subscribers
- can take advantage of this offer by
- extending subscriptions one year NOW.
- Or order thru your newsdealer.

**RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE
SUBSCRIPTION BLANK**

RADIO WORLD, 1493 Broadway, New York City.

Enclosed find \$6.00, for which send me RADIO WORLD for twelve months (52 numbers), beginning, and also, without additional cost, Radio News, or Popular Radio, or Wireless Age, or Radio Dealer, or Radio for twelve months beginning

Name

Street Address

City and State

This Offer Good
Only Until
September 20, 1923

Build Your Own HAZELTINE NEUTRODYNE

with FREED-EISEMANN Licensed Essential Parts

Complete wiring diagram, instructions, etc. sent in special container with patented essential parts. Three NEUTROFORMER COILS mounted on variable condensers, and DOUBLE NEUTRODON (as illustrated), sent for \$24.00. Ask your dealer to show you these parts, as well as complete assembled five-tube Neutrodyne Set in mahogany cabinet, Model NR-5, \$150.

Send 25c for Neutrodyne Constructor, which shows "How to Make the Neutrodyne"

FREED-EISEMANN RADIO CORPORATION
253 Fourth Avenue New York
Licensed by I. R. M. Inc. Under Hazeltine Patents

Radio Equipment for a Philadelphia Hotel

NOT only has the Philadelphia public been bitten with the radio bug, but apparently the more prominent hotel and apartment house owners and engineers also have decided that radio benefits are to be a future added convenience to the comfort of their tenants.

The Pennsylvania Hotel, which is rapidly nearing completion at 39th and Chestnut streets, Philadelphia, contains upward of 600 rooms divided into 140 single rooms and baths and 160 suites ranging from two to six rooms and baths, each completely equipped with dining room and kitchenettes, making it the second largest hotel in Philadelphia and the second largest hotel of its type in the United States. It is to be equipped with one of the most modern and comprehensive radio systems in the world, to be installed by Durham & Company, Inc., radio engineers of Philadelphia, using Western Electric equipment throughout.

A special radio room has been built upon the roof, which will be equipped with a modern type receiving apparatus connected to powerful amplifiers distributing the received radio features from local and distant stations to the main dining room, the lobby, the lounge, smoking room, banquet hall, and grill, separately or to any of these locations simultaneously. The distributing apparatus consists of projectors, or as they are commonly known, "loud speakers," of special design made by the Western Electric Company, and giving a much better quality to the received energy than is present with the usual type of loud speaker.

Another novel feature about this particular installation is the paging system that is to be inter-connected with the radio equipment for the halls and lobbies. For example, the telephone operator sitting at her switch board can, by plugging in a microphone, talk to any one or all of the output stations and make whatever announcements she may desire. In this manner the paging of the tenants and guests is accomplished and announcements of importance may be made to the diners or individuals in various parts of the hotel.

No longer will it be necessary for diners to sit at their tables after having eaten to enjoy the orchestra music, for microphones are to be placed near the orchestra and music sent along wires to the lobbies, and lounges, throughout the Pennsylvania Hotel. Also, the transmission of lectures or speeches from any one of these locations is to be re-transmitted to all gathering places in the hotel, thereby greatly increasing the audience present and distinctly adding to the speaker's appeal.

The tendency of the enterprising builder and engineer is very rapidly approaching the inclusion of the most modern devices of this kind in their building plans. The installation of a mammoth radio equipment of proper design is naturally a problem which would be different in each case and which must be solved by specialists in this newer type of engineering. The term "radio engineering" is hardly an adequate term to cover the problems that are involved, and fortunately the past experience of our telephone engineers in the amplification of sound has very materially assisted this new art.

RUSONITE

CRYSTAL RECTIFIER
(Patent Pending)
THE PERFECT SYNTHETIC CRYSTAL DETECTOR—SENSITIVE OVER ENTIRE SURFACE
No Hunting for "Spots" Loud and Clear. Endorsed by Thousands of Satisfied Users.

Sensitivity Guaranteed	Price Mounted	50c
14 K. Gold Super-sensitive	RUSONITE CATWHISKER. Price Permanent. Will not Oxidize.	25c
RUSONITE REFLEX CRYSTAL	Manufactured Expressly for Reflex Circuits. Will Stand Up Under Heavy Plate Voltage.	Price Mounted \$1.00

Order from your dealer or direct from RUSONITE PRODUCTS CORP.
16 Park Row New York, N. Y.

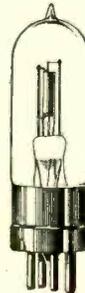
AN AUDIO FREQUENCY TRANSFORMER THAT IS WORTH WHILE ALEMCO



Specially designed to produce superior results with any standard tube. Produces maximum amplification without distortion or howling. Moisture, hard knocks and abuse will not affect its efficiency. Windings completely surrounded with laminated iron and sealed in a non-inductive bakelite housing eliminating leakage. Adaptable to any stage of amplification.

Ratio 4 to 1
The Alemco Coil also gives equal or better results on the first stage than transformers on the market wound as high as 9 to 10 to 1. Will stand any voltage.
Price, \$5.50 Postpaid
ALEMCO, Poughkeepsie, N. Y.

WE REPAIR RADIO TUBES



WD-11...	\$3.50	UV-199...	\$3.50
WD-12...	3.50	C-299...	3.50
UV-200...	2.50	UV-201A...	3.75
UV-201...	3.00	C-301A...	3.75
C-300...	2.50	UV-202...	4.00
C-301...	3.00	C-302...	4.00

Mail orders solicited and promptly attended to.

H. & H. RADIO CO.

P. O. Box 22-B
Clinton-Hill Station Newark, N. J.

YOU SAVE 50% OF THE USUAL COST



WORLD RADIO

Batteries Are Guaranteed 2 years in Writing Will ship C. O. D. subject to inspection, or allow 5% discount for cash with order. Order shipped same day received. WRITE TODAY.

World Battery Co. Dept. 17
1219 So. Wabash Ave. Chicago, Ill.
6 Volt, 100 Amps. \$14.50
6 Volt, 120 Amps. 16.00

2 VOLT STORAGE BATTERY for
WD11—WD12 \$5.00
6 V., 60 Amps. \$10.00
6 V., 80 Amps. 12.50

RADION

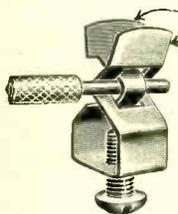
PANELS BLACK AND MAHOGANITE
DIALS—KNOBS

20 Stock Size Panels and Also CUT TO ANY SIZE
"Radion" Tubing: 2", 2 1/4", 3", 3 1/4", 3 1/2", 4", 5"

Cut to Any Length
Special Parts Experimental Work
Made to Order

N. Y. Hard Rubber Turning Co.
212 CENTRE STREET NEW YORK

PERFECT CONNECTIONS



Are Always Sure With Fahnestock Patent Wire Terminal Grips Like a Vice Eliminates Vibrations Easily Attached No Soldering Best of All for RADIO OUTFITS

Clip No. 45 (Illustrated) especially adapted for bus wire. Made in all Sizes and Shapes At your Dealer's

FAHNESTOCK ELECTRIC CO.
EAST AVENUE AND 8TH STREET
LONG ISLAND CITY, NEW YORK



In Stock—All Parts For the

ACMEDYNE CIRCUIT

Tuned Radio-Frequency at Its Best

Described in detail by Mr. Lawrence Coekaday in the August "Popular Radio" and recommended by experts in all parts of the country.

Write or call for complete particulars and prices.
Radio & Mechanical Trading Corp.
23 Warren St. New York

Federal Standard Radio Products

Standard of the Radio World, 130 separate units, each fully Guaranteed.

Write for Catalog.
Federal Telephone and Telegraph Co.,
BUFFALO, N. Y.

Don't Ask for Rheostat—Say

FIL-KO-STAT FOR REAL FILAMENT CONTROL

Radio World Wants Pictures of Radio Fans

Have you had a picture of yourself taken in connection with your radio set? If so, we should be glad to use it in Radio World. All you have to do is to send us the photograph, writing carefully on the back your name and address together with a few words of description telling what kind of a set you operate, etc., etc. Send this to the Art Editor of Radio World and we will use it without any expense to you whatsoever in an early issue of Radio World.

Photographs will be returned to senders when accompanied by return postage and when so requested.

Art Editor, RADIO WORLD, 1493 Broadway, New York City.

DO YOU WANT TO BUY, SELL OR EXCHANGE RADIO OR OTHER GOODS? TRY THIS DEPARTMENT AT 5c A WORD

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS

This department is intended for everybody who wants quick action on short announcements covering the buying, selling, exchanging or general merchandising in the radio and other fields. Readers of RADIO WORLD will find that it pays to read these columns every week. Advertisers will get an eight-day service here—that is, copy received for this department will appear in RADIO WORLD on the news-stands eight days after copy reaches us.

The rate for this RADIO WORLD QUICK-ACTION CLASSIFIED AD. DEPT. is 5c. per word (minimum of 10 words, including address), 10% discount for 4 consecutive insertions, 15% for 13 consecutive insertions (3 months). Changes will be made in standing classified ads. if copy is received at this office eight days before publication. RADIO WORLD, 1493 Broadway, N. Y. C. (Phone, Bryant 4796).

DETECTIVES NEEDED EVERYWHERE—Work home or travel. Experience unnecessary. Write. American Detective System, 1968A Broadway, N. Y.

RADIO SET—Extremely sensitive tuner and one step in 8x18 walnut cabinet. I hear Kansas City Star; Omaha, Neb., etc. Atwater Kent parts. Complete with two WD11 tubes and phones, \$70 postpaid. Address, Garth Showers, Tannersville, N. Y.

RADIO FANS AND PROFESSIONALS—How many know the correct CODIFICATION of all characters, punctuations and signs (such as \$, %, etc.)? Nine out of ten don't! Our instructor who has had 35 years experience (eight years of which with Uncle Sam) as MORSE and RADIO telegrapher, has just published the only CHART known to give fully the correct codification of all characters of both codes. This chart is indispensable to all up-to-date beginners and veterans alike. Fifty cents (money order preferred) will bring chart; also much information extremely interesting to young men and women (18 to 70) with this information and a little PEP on your part, you can qualify shortly (as scores of our graduates have done) and secure positions paying \$1,500 to \$3,000 yearly. (See Civil Service Bulletins 215, 357 and 54.) We are registered with the U. S. Civil Service Commission at Washington and can help you. AMERICAN TELEGRAPHIC STUDIO, BOX 793, WORCESTER, MASS.

FOR SALE—De Forest Portable Radiophone Transmitter. 5-watt bulbs; new, \$100 net F. O. B. P. O. Box 33, Red Bank, N. J.

CHEAPEST TO BUILD—Easiest to tune. Get particulars Rokay Single Control Hook-up. Describe your set. Rokay Electric Company, Ingo-mar, Ohio.

LONESOME! MAKE NEW AND TRUE FRIENDS. Confidential. Write DOLLY GRAY AGENCY, Box 186B, Denver, Colo.

VACUUM TUBES REPAIRED. Reasonable. Send for our price list. Vacuum Electric, Station C, Toledo, Ohio.

WANTED—One K. W. used Navy Quenched Spark Gap. Also Price wanted. Harvard Radio Laboratories, P. O. Box 1781, Boston, Mass.

60,000 MILES ON A HOME-MADE RECEIVER. 2,600-mile range. 100 station log and hook-up for the asking. Maitland Roach, 2908 Columbia Ave., Philadelphia, Penn.

LEARN THE RADIO CODE in 3 hours or less by the Corydon Snyder Code Method. Money back if not satisfied. 50 cents postpaid, or particulars for stamp. Corydon Snyder, 1161 So. Ridgeland Ave., Oak Park, Ill.

MAGNAVOX TYPE R3—Latest curvex, improved acoustic models, in original sealed factory cartons. List \$35. Introductory offer \$25. RADIO CENTRAL, Dept. W, Abilene, Kan.

OLD MONEY WANTED—\$2.00 to \$500.00 EACH paid for hundreds of Old and Odd Coins. Keep all old money. Send 10 cents for New Illustrated Coin Value Book, 4x6. You may have valuable coins. Get posted. We pay CASH. CLARKE COIN COMPANY, Ave. 83, Le Roy, N. Y.

THE AMATEUR ELECTRICIAN explains the "How and Why" of electricity with plans for making and operating wireless, telephones, electric bells, toys, novelties, etc. Over 70 illustrations, 64 pages. Only 10c. R. W. Collins Co., 197 Fulton Street, Brooklyn, N. Y.

EDISON Elements for making "B" Batteries, 6c per pair; tubes, 2c each. Nickel Wire, Insulators and Cabinets at reasonable prices. TODD ELECTRIC CO., 178 Lafayette St., New York City.

150 FUNNY PARODIES on latest songs, 25c. Book catalog, 2c. R. W. Collins Co., 197 Fulton St., Brooklyn, N. Y.

GET OUR PRICES on Plate and Filament Heating Transformers. L. Werts, 409 St. Julian St., Pekin, Ill.

ALL ESSENTIAL PARTS for building Neutrodyne Receiver, complete instructions, etc., \$21.50 C. O. D. Reinartz tuning coils, \$1.50. R. Schwartz, Buchanan, Mich.

EXCHANGE JOLLY, INTERESTING LETTERS THROUGH OUR CLUB. Betty Lee, Inc., 4254 Broadway, New York City. Stamp appreciated.

SECOND-HAND Westinghouse R. C. Regenerative receiver, consisting of detector and two-step amplifier, \$65.00. Three Erla Radio Frequency Transformers, \$6.00; Crosley two-step amplifier, \$14.00. All of the above is good as new and will work with all standard bulbs. Address Randolph Whitehand, Albany, Georgia.

SUPER-SIMPLICITY CIRCUIT—1,000 to 1,500 miles on one tube, one control, 150 to 25,000 meters. No rheostat, storage battery, vario coupler, variometer, 3-coil mounting, variable inductance, tape or radio frequency. Nothing to guess about. Complete hook-up and particulars, \$1.00. No checks. Build your own. Save 50% and get better results. RADIO EXPERIMENTAL LABORATORY, Box 194A, Berkeley, Calif.

FOR SALE—Three Radio Corporation, 200 to 5000 meter radio frequency transformers, like new, fine for superhetrodyne, \$5.00 each. Fine Phonograph attachments, needle operating kind. Guaranteed good as Magnavox, \$10.00 each. Any of above sent post paid, collect, on receipt of \$1.00. Everything sold on money-back guarantee. RAYMOND MOORE, Box 404, Lakeside, Ohio.

RADIO WORLD'S FALL BUYERS' NUMBER

DATE OF IMPORTANT ISSUE—OCTOBER 6

(LAST BLACK FORM CLOSES SEPTEMBER 27)

Hundreds of thousands of radio enthusiasts who will be returning from their vacations, to say nothing of the army of new radio fans that will come into the radio fall season for the first time, will look forward to the buying of sets and general radio equipment in the autumn. Radio World will devote a special issue to these potential purchasers of goods—the **FALL BUYERS' NUMBER**.

Our regular advertising rates will be in force as follows: \$5.00 per inch, single column \$50, \$150 per page, with discounts of 10% four times, 15% thirteen times, 20% fifty-two times (yearly) contract. Classified, 5c a word.

Special service and value to advertisers in Radio World's **FALL BUYERS' NUMBER**. All advertisers who give us copy for quarter page or more space in Radio World's **FALL BUYERS' NUMBER** will, on request, have their announcements appear in **two colors at the price of one**—in case copy is in our hands by September 22.

Radio World is already at work on a country-wide circulation campaign for **FALL BUYERS' NUMBER**, which will be so interesting from a pictorial and text standpoint that it will have an unusually large sale and advertisers will receive unusually fine value.

Write, wire, or phone now for special positions

RADIO WORLD, 1493 BROADWAY, NEW YORK CITY

TECHNICAL BOOKS FOR RADIOISTS, ELECTRICIANS, AND OTHERS

Construction of Radio Phone and Telegraph Receivers for Beginners—By M. B. Sleeper.....	\$0.75
Ideas for the Radio Experimenter's Laboratory—By M. B. Sleeper.....	.75
The Radio Experimenter's Hand Book—By M. B. Sleeper.....	1.00
Radio Hook-Ups—By M. B. Sleeper.....	.75
Radio Design—Data for Radio Transmitters and Receivers—By M. B. Sleeper.....	.75
Construction of New Type Transatlantic Receiving Sets—By M. B. Sleeper.....	.75
How to Make Commercial Type Radio Apparatus—By M. B. Sleeper.....	.75
A B C of Vacuum Tubes Used in Radio Reception—By M. H. Lewis.....	1.00
Wireless Telegraphy and Telephony Simply Explained—By Alfred P. Morgan.....	1.50
Experimental Wireless Stations—By P. E. Edelman.....	3.00
Six Successful Radio Sets—By M. B. Sleeper.....	.50
101 Receiving Circuits—By M. B. Sleeper.....	.50
Arithmetic of Electricity—By Prof. T. O'Connor Sloane.....	1.50
Commutator Construction—By William Baxter, Jr.....	.35
Dynamo and Electric Motors and All About Them—Dynamo Building for Amateurs, or How to Construct a Fifty Watt Dynamo—By Arthur J. Weed.....	1.00
Electric Bells—By M. B. Sleeper.....	.75
Experimental High Frequency Apparatus, How to Make and Use It—By Thos. S. Curtis.....	.50
Electricity Simplified—By Prof. T. O'Connor Sloane.....	1.50
Electrician's Handy Book—By Prof. T. O'Connor Sloane.....	4.00
Electric Toy Making, Dynamo Building and Electric Motor Construction—By Prof. T. O'Connor Sloane.....	1.50
House Wiring—By Thos. W. Poppe.....	1.00
How to Become a Successful Electrician—By Prof. T. O'Connor Sloane.....	1.50
Standard Electrical Dictionary—By Prof. T. O'Connor Sloane.....	5.00
Storage Batteries Simplified—By Victor W. Page, M.S.A.E.....	2.00
Telephone Construction, Installation, Wiring, Operation and Maintenance—By W. H. Radcliffe and H. C. Cushing.....	1.50
Wiring a House—By Herbert Pratt.....	.35
The Modern Gasoline Automobile, Its Design, Construction, Operation—By Victor W. Page, M.S.A.E.....	4.00
Hints and Tips for Automobileists—By Victor W. Page.....	.75
Questions and Answers Relating to Modern Automobile Construction, Driving and Repair—By Victor W. Page.....	2.50
Automobile Starting, Lighting and Ignition Systems—By Victor W. Page.....	2.00
Automobile Repairing Made Easy—By Victor W. Page.....	4.00
The Model T Ford Car, Its Construction, Operation, etc.—By Victor W. Page.....	4.00
Automobilist's Pocket Companion and Expense Record—By Victor W. Page.....	1.50
Location of Gasoline Engines Troubles Made Easy—By Victor W. Page.....	.35
Location of Carburetion Troubles Made Easy—By Victor W. Page.....	.35
Location of Ignition System Troubles Made Easy—By Victor W. Page.....	.35
Location of Cooling and Lubricating Troubles—By Victor W. Page.....	.35
Lubrication of the Motor Car Chassis—By Victor W. Page.....	.35
Location of Starting and Lighting System Faults—By Victor W. Page.....	.35
Location of Ford Engine Troubles Made Easy—By Victor W. Page.....	.35
Location of Motorcycle Troubles Made Easy—By Victor W. Page.....	.35
A B C of Aviation—By Capt. Victor W. Page.....	2.50
Aviation Chart—By Lieut. Victor W. Page.....	.35
Glossary of Aviation Terms—English-French; French-English—By Victor W. Page and Paul Montarlot.....	1.00
Westinghouse E-T Air Brake Instruction Pocket Book—By Wm. W. Wood.....	2.50
Machine Shop Arithmetic—By Colvin-Cheney.....	.75
Practical Instructor and Reference Book for Locomotive Firemen and Engineers—By Chas. F. Lockhart.....	2.50
Gas, Gasoline and Oil Engines—By Gardner D. Hiseox.....	3.00
The Gasoline Engine on the Farm—Its Operation, Repair and Uses—By Xeno W. Putnam.....	3.00
Lathe Work for Beginners—By Raymond F. Yates.....	2.00
The Lathe—Its Design, Construction and Operation With Practical Examples of Lathe Work—By Oscar E. Perrigo.....	3.00
Complete Practical Machinist—By Joshua Rose.....	3.00
Shop Kinks—By Robt. Grimshaw.....	3.00
Home Mechanic's Workshop Companion—By Andrew Jackson, Jr.....	.75
Machine Shop Tools and Shop Practice—By W. H. Vandervoort.....	4.50
The Naval Architect's and Shipbuilder's Pocket Book—By Clement Mackrow & Lloyd Wollard.....	6.00
Prospector's Field-Book and Guide—By H. S. Osborn.....	3.00
Model Making—By Raymond Francis Yates.....	3.00
Motor Boats and Boat Motors—By V. W. Page and A. C. Leitch.....	4.00
Popular Handbook for Cement and Concrete Users—By Myron H. Lewis.....	3.00
Punches, Dies and Tools for Manufacturing in Presses—B. J. V. Woodworth.....	4.50
Standard Electrical Dictionary—By Prof. T. O'Connor Sloane.....	5.00
A Course in Mechanical Drawing—By Louis Rouillon.....	1.50
Self-Taught Mechanical Drawing and Elementary Machine Design—By F. L. Sylvester, M.E.....	2.50
Practical Pattern Making—By F. W. Barrows.....	2.50
American Stationary Engineering—By W. E. Crane.....	.75
Steam Engineer's Arithmetic—By Colvin-Cheney.....	.75
500 Plain Answers to Direct Questions on Steam, Hot-Water, Vapor and Vacuum Heating—By A. G. King.....	2.50
Standard Practical Plumbing—By B. M. Starbuck.....	3.50
Mechanical Drawing for Plumbers—By B. M. Starbuck.....	2.00

Any of these books sent prepaid to any part of the world on receipt of order in cash, check, stamps, express or postal order.

THE COLUMBIA PRINT
1493 BROADWAY NEW YORK CITY

RADIO WORLD

TELEPHONE, BRYANT 4798
PUBLISHED EVERY WEDNESDAY (Dated SATURDAY OF SAME WEEK)
FROM PUBLICATION OFFICE,
1493 BROADWAY, NEW YORK, N. Y.
BY HENNESSY RADIO PUBLICATIONS CORPORATION

ROLAND BURKE HENNESSY,
President and Editor

M. B. HENNESSY, Vice-President
FRED S. CLARK, Secretary and Manager
1493 BROADWAY, NEW YORK, N. Y.

European Representative: The International News Co., Breems Bldgs., Chancery Lane, London, Eng. Paris, France: Brenano's, 37 Avenue de l'Opera.

Managing Editor: Stephen L. Coles
Technical Editor: Robert L. Dougherty

SUBSCRIPTION RATES

Fifteen cents a copy. \$6.00 a year. \$5.00 for six months. \$1.50 for three months. Add \$1.00 a year extra for foreign postage. Canada 50 cents.
Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order, is automatic acknowledgment of their subscription order.

ADVERTISING RATES

One page: one time—\$150.00.
Half-Quarter, Third and Two-thirds pages at proportionate rates.
One inch, one time—\$5.00. Per estate line \$0.40.
On four consecutive issues, 10% discount.
On thirteen consecutive issues, 15% discount.
Cover and preferred-position rates made known on application.
Terms: 30 days net. 2% 10 days.

CLASSIFIED ADVERTISEMENTS

Five cents per word. Minimum 10 words. Discount of 10% on 4 consecutive issues—15% on thirteen consecutive issues. Cash with order.

Entered as second-class matter, March 28, 1923, at the Post Office at New York, New York, under the act of March 3, 1879.

IMPORTANT NOTICE

While every possible care is taken to state correctly matters of fact and opinion in technical and general writings covering the radio field, and every line printed is gone over with a scrupulous regard for the facts, the publisher disclaims any responsibility for statements regarding questions of patents, priority of claims, the proper working out of technical problems, or other matters that may be printed in good faith and on information furnished by those supposed to be trustworthy. This statement is made in good faith and to save time and controversy in matters over which the publisher cannot possibly have control.

Here's an Amateur Who Wants Help

EDITOR Radio World:—I would like to state that I was greatly enthusiastic about radio formerly, but sad to relate my enthusiasm has disappeared entirely due to the following: I possess a Flewelling set that does not work which I purchased in good faith. It worked at first poorly and the tube which I purchased only lasted two weeks. I then had the hook-up changed by someone whom I thought knew something about radio, but really knows nothing, and the set stopped entirely. My proposition is as follows: If any successful Flewelling fan will change the hook-up of my set, which is all that is necessary in order to make it work successfully, I will purchase a new tube and try to regain my lost enthusiasm. This latter will prove whether the readers of the Radio World are really willing to help a radio fan who has tried to reap the joy of radio, but has only suffered disappointment, by their response to the above letter.

I thank you for your kind attention and hope that you will publish the above letter.
Yours respectfully,
JULIUS MILLER.

121 West 114th St.,
New York City.

Not Important at Present to Buffalo

EDITOR, RADIO WORLD: Referring to your letter of July 23rd, it is possible that in the future a municipal broadcasting station may be deemed necessary, but at the present time there are many other things which seem more important.

Yours very truly,
FRANK X. SCHWAB,
Buffalo, N. Y. Mayor.

HEAR 2000 MILES on a One Tube Set!

Distance, Volume, Very Select Tuning. Easiest Set to Operate. Easily Assembled.

GUARANTEED TO WORK or money back

You Get the Following:

Genuine mahogany cabinet, 1 drilled grade A hard rubber panel, 1 23-plate condenser, 1 variometer, 1 rheostat, 1 tube socket, 2 3-inch dials, 8 initialed binding posts, 3 lengths spaghetti, 3 lengths bus wire, 1 grid leak and condenser, 1 diagram.

All Best Standard Parts.

ONLY \$6.90 WHY PAY MORE?

Diagram Alone, 50 Cents; Circular Free

Scientific Radio Laboratory
25 THIRD AVE. NEW YORK, N. Y.

Reinartz Coil \$1.85

The Improved Basket Weave, Covering All Broadcasting Wavelengths

With each coil we send FREE two large blue-prints, picture hookup and panel layout, list of materials, and fully illustrated instructions for construction and operation.

Buy before the fall rush sets in.

We sell all parts required for this wonderfully efficient receiver—panel, coil, condensers, socket, vernier rheostat, variable gridleak, dials, switches, posts, contact points, wire, spaghetti, etc. (no tubes or phones) for only \$9.85. Postage additional on all shipments.

Send no money. PAY THE POSTMAN. All goods shipped Parcel Post C. O. D.

RADIO SURPLUS STORES
HELENA, MONTANA

STOP—LOOK—LISTEN

C. White's "Super-Amplifier" completely assembled with two UV-201A tubes **\$38.00**

A real Push-Pull Amplifier bargain.

Write NOW

COREY HILL BATTERY CO.
1354 Commonwealth Ave. Boston 34, Mass.



**Pruden Reliable
Radio Specialties
for Good Results**

Dealers write today for our interesting proposition.

FREDERICK H. PRUDEN, Inc.
993 Bergen Ave., Jersey City, N. J.

PATENTS

To the Man with an Idea

I offer a comprehensive, experienced, efficient service for his prompt, legal protection, and the development of his proposition.

Send sketch or model and description, for advice as to cost, search through prior United States patents, etc. Preliminary advice gladly furnished without charge.

My experience and familiarity with various arts frequently enable me to accurately advise clients as to probable patentability before they go to any expense.

Booklet of valuable information, and form for properly disclosing your idea, free on request. Write today.

RICHARD B. OWEN
Patent Lawyer

32 Owen Building, Washington, D. C.
2276-P Woolworth Bldg., New York City

The Condenser Sensation of Modern Radio



Through the accuracy and dependability of Freshman Condensers, hook-ups and circuits have been perfected which have completely revolutionized the art of Radio Reception.

These little Storers of energy and rectifiers of Radio Current are the very heart of a well-built radio set.

The proper fixed condenser will make all the difference in the world in the reception, clarity and selectivity your set affords.

Capacity	Each	Capacity	Each
.0001	\$.35	.002	\$.40
.00015	.35	.0025	.50
.00025	.35	.003	.60
.0002	.35	.004	.75
.0003	.35	.005	.75
.00035	.35	.006	.75
.0005	.35	.008	1.00
.0006	.40	.01	1.00
.0008	.40	.015	1.50
.001	.40	.02	2.00
.0015	.40	.025	2.50

The FRESHMAN is so designed that constant equal pressure is exerted on the condenser plates over the entire area. They are the only condensers that do this and therefore the only condensers that avoid noises, which are due to variable pressure on the plates.

At your dealers, otherwise send purchase price and you will be supplied postpaid.

Chas. Freshman Co. Inc.
Radio Condenser Products
106 SEVENTH AVE., NEW YORK

New Magnavox Products

AN announcement of interest to every radio user has been made by the Magnavox Company regarding the introduction of important additions to their already famous Magnavox line of reproducers and power amplifiers. Among these new models are the Magnavox combination sets A-1-R and A-2-R; a new Magnavox reproducer M-1 and a new one stage Magnavox power amplifier A-1. The combination sets consist of the electro-dynamic Magnavox reproducer with 14 inch curvex horn and a Magnavox audio-frequency power amplifier (one or two stage) incorporated in a new type of radio unit which might be termed an "amplifying reproducer."

This combination forms a highly desirable unit for addition to any radio receiving set, giving the user the utmost in adaptability and efficiency.

The rheostats (maximum resistance 30 ohms) and circuits are so arranged in Magnavox combination sets that five-watt transmitting tubes or any type of amplifying tube may be successfully used, thus covering the widest possible range of operating conditions from the smallest home to the concert hall.

These instruments are also equipped with a modulating device for controlling volume, another unique Magnavox feature. Binding post terminals are provided by bakelite panels on the back. The case is of heavy metal forming a shield against outside forces, and is attractively finished in dark crystallized enamel. "On" and "off" switches are provided on top of the case.

Another interesting and important Magnavox product is the M-1 reproducer with 14 inch curvex horn. This instrument is of the semi-dynamic type and has been developed by Magnavox engineers along original principles to meet the requirements of dry battery receiving sets, as it consumes no current from the battery. The Magnavox reproducer M-1 is particularly recommended where low voltage and low current tubes are used. The base is equipped with a five foot flexible cord and has binding posts for extensions. The standard finish is crystallized black but the M-1 is also furnished in special de luxe polychrome finish at the same price.

While these new types of Magnavox instruments are of great interest as being radically different from anything previously manufactured by this company, many users will also welcome the new Magnavox one-stage power amplifier A-1. This, in many cases, is just what is needed to bring in and reproduce the distant stations. It is particularly recommended for use in addition to one or more stages of previous audio-frequency amplification. A-1 is of heavy metal attractively enameled and crystallized. Binding post terminals are provided by a bakelite panel on the back. Any type of vacuum tube may be used.

From the great volume of orders the Magnavox Company is receiving from the trade for these new models it is obvious that the models described above meet a very important need in the radio world.

DON'T LOSE A SINGLE NUMBER

Send \$6.00 for Radio World and get 52 issues without a break.



Aetaco Condensers

Are made with just the one purpose in mind of giving you the most serviceable condensers obtainable. Fine adjustment. Accurate spacing.

43 Plate Condenser	.....\$1.75
23 Plate Condenser	.....\$1.35
17 Plate Condenser	.....\$1.25
11 Plate Condenser	.....\$1.00
3 Plate Condenser	.....60c.

AETACO

Back Mounting Inductance Switch...75c.

Complete line of Receiving and Transmitting Apparatus.

Attractive Discounts to Dealers and Jobbers

American Radio Stores

235 Fulton Street New York City

10c

Brings you our new catalogue and radio information booklet illustrating and describing the Super-Regenerative and other latest and popular circuits. Our technical staff is at the disposal of our customers. Make use of their knowledge. Merchandise shipped immediately on receipt of order. U. S. Bureau of Standards "Radio Book." Special 65c. FREMONT RADIO SALES CO. 227 FULTON STREET, NEW YORK CITY



SPECIAL PHONE SUNBEAM PRICES

Special—23 Plate Vernier Condenser, \$3.25

BRANDES PHONES, \$5.00

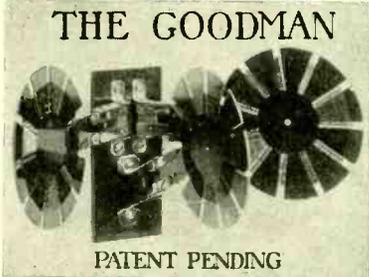
Send us your address—Get our Special Weekly Offerings.

SUNBEAM ELECTRIC CO.

71 THIRD AVE. 207 East 14th St. NEW YORK

DO YOU WANT PLANS FOR MAKING THE SLEEPER DUOTOL RECEIVER, USING THE SLEEPER TWINS. —Two Variometers and the fixed Coupler? SEND 10c for the June Issue of RADIO AND MODEL ENGINEERING.

SLEEPER RADIO CORPORATION
88 W. Park Place New York City



The Niftiest Short Wave Tuner on the Market Only \$6.00 & PP on 1 lb. Send for pamphlet.

L. W. GOODMAN
DREXEL HILL, PA.

Mr. C. H. Jenkins, Audubon, N. J., writes:—"On July 13th, tuned in WBAP, Fort Worth, Texas, (476 meters), with the GOODMAN, while WDAR (396 m.) and WOO (509 m.), powerful local stations, were broadcasting dance music."

"B" BATTERIES

Depleted "B" Batteries are usually the cause of your trouble in receiving. Eliminate it by buying your "B" Batteries freshly tested and passed by our laboratories—sold direct to the consumer at the following low prices—guaranteed in every respect!

	Large	Medium	Small
22½ Volt plain	.....\$1.25	\$1.00	\$0.70
22½ Volt variable	.....\$1.38	\$1.13	\$0.75
45 Volt plain	.....\$2.50	\$1.75	—
45 Volt variable	.....\$2.75	\$2.00	—

Any type of batteries made to order—send money order including postage—or order for C. O. D.

SPECIAL OFFER—We offer our customers a 0-50 standard Voltmeter listed at \$2.75 for \$1.87 with any order for batteries amounting to \$5.00 or over.

ROSENDAL & CO., Chemical Engineers, 2 Stone Street, New York

DX STATIONS ON A ONE TUBE SET

Easily Constructed by Anyone
Guaranteed to Operate or Money Refunded
COMPLETE PARTS

1 Genuine Mahogany Cabinet; 1 Drilled Hard Rubber Grade A Panel; 1 23-Plate Condenser; 1 Variometer; 1 Rheostat; 1 Tube Socket; 2 3-Inch Dials; 8 Initialed Binding Posts; 3 Lengths of Spaghetti; 3 Lengths of Bus Wire; 1 Grid Leak and Condenser; 1 Bezel; 1 Diagram Free.

Only \$8.50

Ask for free price list on all standard Radio merchandise. Orders promptly attended to.

GLOBE RADIO SHOP

115-117 West 3rd St. New York, N. Y.

Sleeper's Two Latest Radio Books

Two new and remarkably good radio books by M. B. Sleeper—one is entitled "Six Successful Radio Sets," with design data and instructions for receiving sets specially selected for exceptionally long distance reception. The other is "101 Receiving Circuits," being a most complete compilation of diagrams including circuits for a regenerative, superregenerative, Reinartz, Flivver, Flewelling, super-heterodyne, reflex and radio frequency sets. Each book mailed on receipt of fifty cents and ten cents extra for postage. Both books for \$1.00 and no extra charge for postage. The Columbia Print, 1493 Broadway, New York City.

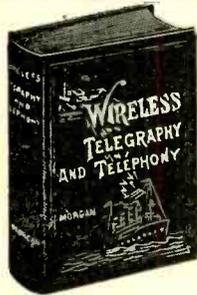
SPECIAL OFFER TO NEW RADIO WORLD SUBSCRIBERS:

Send \$6.00 for yearly subscription for Radio World (52 numbers) and these two Sleeper Radio Books will be sent you free, parcel post prepaid. This offer good only until September 20, 1923. If you are already a subscriber, send \$6.00 NOW for a renewal and books will be sent you.

IF YOU ARE INTERESTED IN RADIO YOU NEED THESE BOOKS

Radio Books for Your Vacation

Telling How to Operate a Radio Set—How to Build a Set—Principles of Vacuum Tubes and Other Radio Problems



Wireless Telegraphy and Telephony Simply Explained

By ALFRED P. MORGAN

One of the most complete and comprehensive treatises on the subject ever published. A study of its pages will enable one to master all the details of the wireless transmission of messages. The author explains in simple language the theory and practice of wireless telegraphy and telephony. 154 pages, 156 engravings.....PRICE \$1.50



The A B C of Vacuum Tubes Used in Radio Reception

By E. H. LEWIS

Assoc. I. R. E., and Radio Instructor

Written particularly for the person who "knows nothing about radio," but who would like to gain an understanding of the elementary principles of operation of vacuum tubes and various circuits in which they are used for the reception of radio-telegraph signals and radio-telephone music and speech. Illustrated.....PRICE \$1.00



Experimental Wireless Stations

By P. E. EDELMAN

Tells how to make apparatus to not only hear all telephoned and telegraphed radio messages, but also how to make simple equipment that works for transmission over reasonable long distances. Then there is a host of new information included. The first and only book to give you all the recent important radio improvements, some of which have never before been published, 392 pages, 167 illustrations.....PRICE \$2.00

☐ The 3 Books for \$5.00 to One or Different Addresses
Any of These Books Sent Prepaid on Receipt of Price

ADDRESS **THE COLUMBIA PRINT**
ROOM 326, NO. 1493 BROADWAY, NEW YORK

PADEREWSKI KNOWS QUALITY

From ALL OTHER Amplifying Devices

PADEREWSKI

Selected  For Its Purity of

Tone and Perfect Reproduction

*Thousands of Highly Satisfied Owners
Applaud His Choice*

4

Reasons Why



24" High
10" Bell
Crystalline
Finish

1. Large Heavy Base Eliminates top heaviness.
2. Combination Rattan Reed and fiber strengthens horn and gives beautiful quality without distortion.
3. No adjustment necessary; will work perfectly on any good two-stage set.
4. Guaranteed against mechanical defects of any kind for one year.

LIST

\$22.50

F. O. B. Factory

THESE ARE EXCLUSIVE BEL-CANTO FEATURES

Dealers and Jobbers

Write for Territory and Discounts

BEL-CANTO MANUFACTURING CO.

417 EAST 34th STREET, NEW YORK CITY

Phone: Vanderbilt 8959