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The limited space permits only a few additional extracts. "You bring out a man's resources."—California student. "I like your personal service."—Missouri student. "You take an interest in each student individually."—Connecticut student. "You remind me of a great teacher—always ready to lend a helping hand."—Another Connecticut student. "Too much cannot be said for Y. M. C. A. instruction service."—Illinois student. "Course instructs through training. Am able to use the instruction in my regular work."—Ohio student. "You seem to read every single word of my answers and even catch my pen-errors."—Massachusetts student. "Course did me more good than the course I took in college."—N. Carolina student. "If a man knows no so anything at all, your system will bring it out."—Texas student. "My course has not only brought more interesting work, but multiplied my earning power by three."—Nebraska student. "Have been doing practical advertising lately and received favorable comments on it from our manager."—N. Dakota student.

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### A Simple Radio- phone Receiver

By JAMES LEO McLAUGHLIN  
(Continued from page 1141)

number each fastener from right to left, 1 to 9. Alongside of hole No. 1 push two fasteners with a paper clip underneath—mark GND (ground). One half inch down from GND, punch a small hole; this is the starting point of the coil.

Take the wire and push the end thru the hole. Wrap the end around one of the fasteners GND (on the inside of the container). Be sure that where the wire touches the fastener, the enamel has been scraped off or else a poor connection will result.

Next pull the wire tight and commence winding the coil. The total number of turns is seventy, and a tap is taken off at each of the following turns: The 15th, 20th, 25th, 30th, 35th, 40th, 45th, 55th and the 70th.

Fig. 1 shows how to tap the coil. The important things to look out for are that the coil is wound as tight as possible, and that the enamel is scraped off the wire, where it makes connection with the fasteners. The 15th turn is contact No. 1, the 20th No. 2, etc.

The next job is the switch that moves over the contacts. Fig. 2 shows how this is made. Take one of the large fasteners, push the ends thru the side of the cover, close to the lid. Bend one end down flush with the side and push the other end thru the top and bend over.

Put the cover back on the container and bend the end of the fastener so that it rides over the contacts easily, when the cover is turned, but be sure that it touches each of them. Break off the surplus end.

The other large fastener is pushed thru the lid opposite the switch and is bent, as shown in Fig. 2, so that it can hold the small crystal. A short piece of bare wire (about No. 24 will do), acts as the cat-whisker, a pin is fastened to one end and the other end is wrapped around the end of the switch—the part that is bent over (see Fig. 2).

Fig. 3 shows the diagram of connections and needs little comment.

The telephone receiver is a single Murdock without head band, and can be purchased for about \$2.00. Of course any other kind may be substituted.

For the antenna one-half pound of No. 18 bare copper wire will do. This will give about 100 feet of wire. Two porcelain cleats will also be required and should not cost over 5 cents. The wire can be had for about 30 cents.

String the wire the greatest length possible, and attach outer end to a tree or other elevation, at least thirty feet high (see Fig. 4). The other end of the wire enters the house and is attached to the switch button marked ANT and a short piece of rubber tubing should be slipped over the wire where it passes through the wall of the building.

A good ground can be had by connecting a wire to the nearest gas or water pipe. Scrape the pipe for a length of about two inches, so that it shines, then wrap several turns of wire around it and twist tightly.

To operate the set, bend the cat-whisker wire so that the pin rests on the crystal. Move the pin over the surface until a signal is heard; at the same time move the switch over the contacts, and leave it on the one that brings in the station the loudest. With this set in New York City using only a single No. 24 wire, 25 feet long strung up in a room, WDY'S and WJZ'S concerts came in fine, and on several occasions, the phone could be held about six inches from the ear and still the music and voice could be distinguished.



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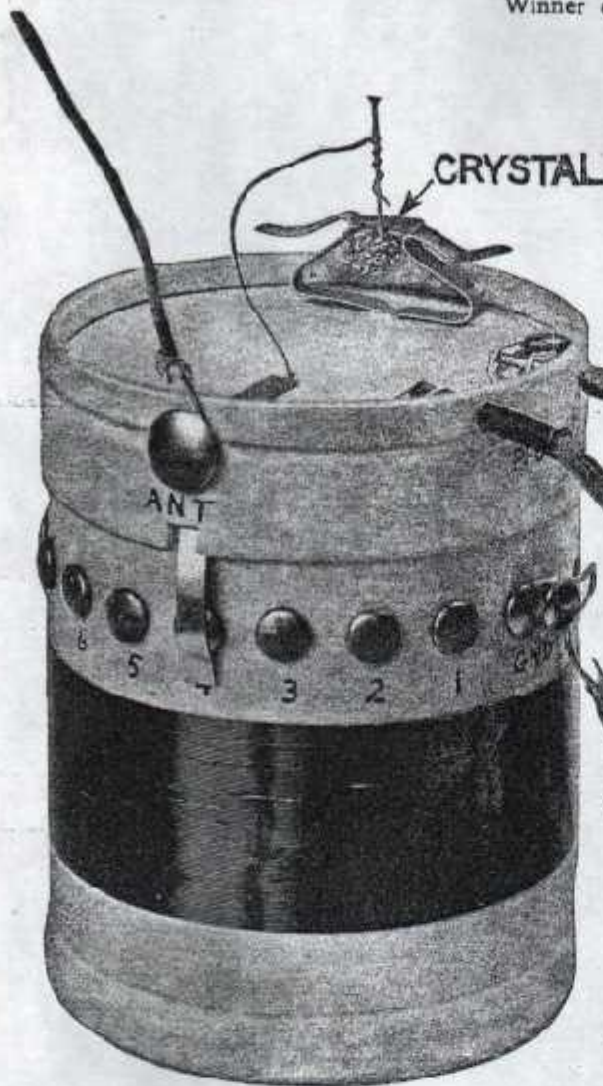
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# A Simple Radiophone Receiver

By JAMES LEO McLAUGHLIN

Winner of First Prize \$100.00



CRYSTAL

With Aerial Wire and Insulators Included, This Complete Radiophone Receiving Set Did Not Cost Over \$3.00 and This Covered the Cost of the Telephone Receiver.



**T**HE important points of this set are 1st: It is simple in construction and operation. A knife or razor blade and a small nail are the only tools required to make it. The complete set can easily be constructed in about one-half hour.

2d. It is inexpensive, the total cost, including the 'phone and antenna is less than \$3.00, the set itself costing only 21½ cents.

3d. It is as efficient as most of the crystal sets now being sold and in most cases superior to them.

## WHAT THIS OUTFIT WILL DO

**A**n outfit of this kind will bring in radiophone music and radiophone entertainment as sent out by the broadcasting stations providing the outfit is not more than 15 to 20 miles from the station.

The aerial in that case should be at least 60 feet long and composed of four wires.

An outfit of this kind cannot be used for any greater distance than 15 to 20 miles at the most. The further you are away from the broadcasting station the higher and longer your aerial must be.

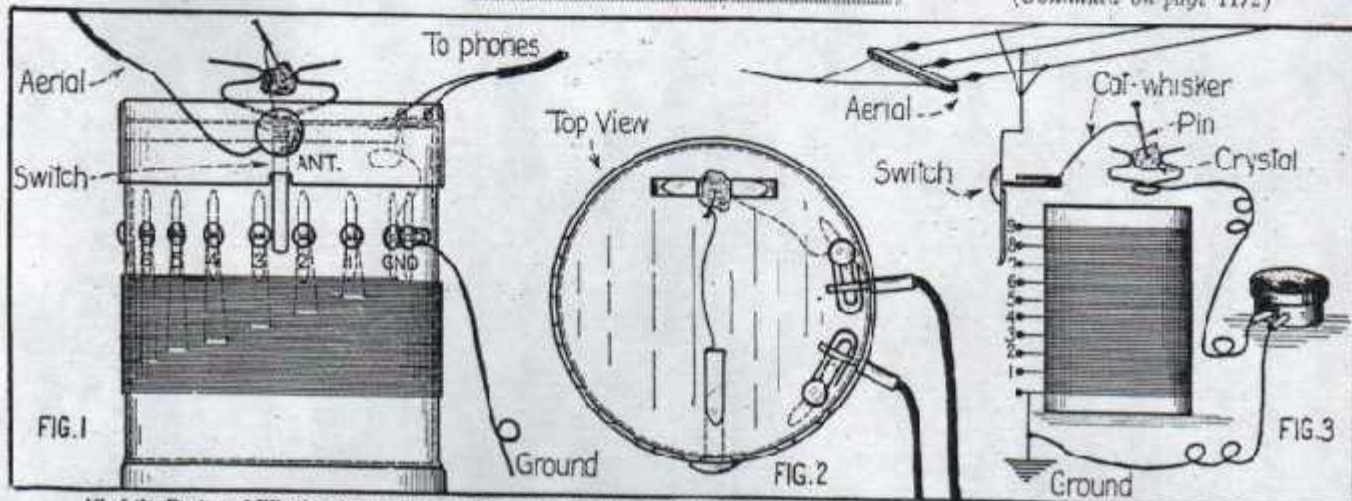
—EDITOR.

The material required is as follows:

- 1 Paper container (4" in diameter).
- 13 Paper fasteners (small size).
- 2 Paper fasteners (large size).
- 3 Paper clips
- 2 Oz. No. 26 enameled copper wire.
- 1 Small piece of silicon or galena.
- 1 Common pin.

Take the container and pinch nine holes one inch down from the top, with a small nail, one half inch apart. Into each hole push a paper fastener. With pen and ink

(Continued on page 1172)



All of the Parts and Winding Arrangement Followed in Building the \$100.00 Prize-Winning Radiophone Receiving Set Are Here Illustrated.