Loop Crystal Set

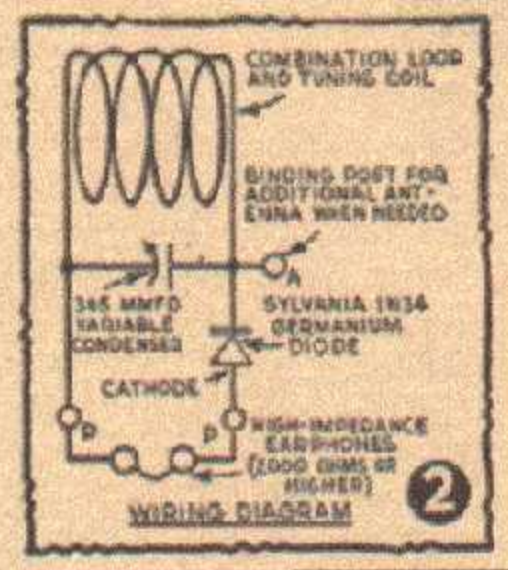
Just aim the loop at the station you want, and then enjoy yourself

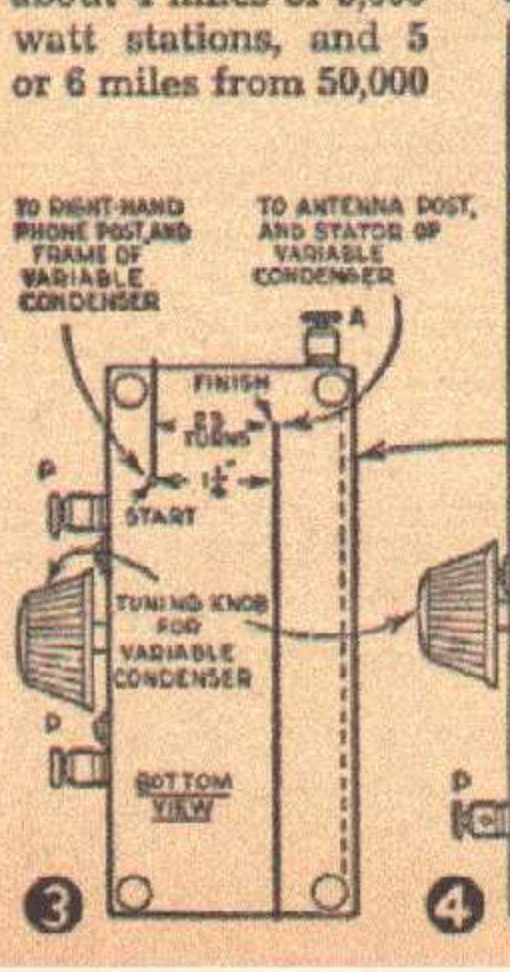
By ARTHUR TRAUFFER

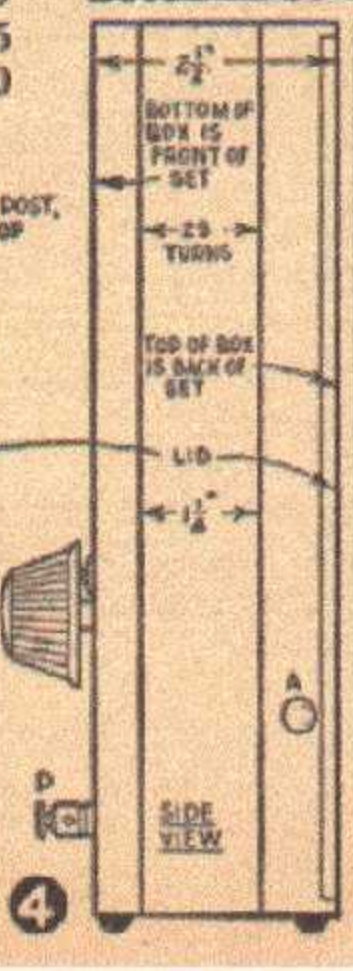
IN THESE days of powerful transmitters, sensitive germanium diodes, and sensitive earphones, a loop crystal set for local stations is practical and sometimes a distinct advantage. For example, for those living within about 4 miles of 5,000 watt stations, and 5 or 6 miles from 50,000 watt stations, no conventional antenna or ground is needed. The loop crystal set can be carried around playing, and used anywhere in the house; just aim the loop at the desired station.

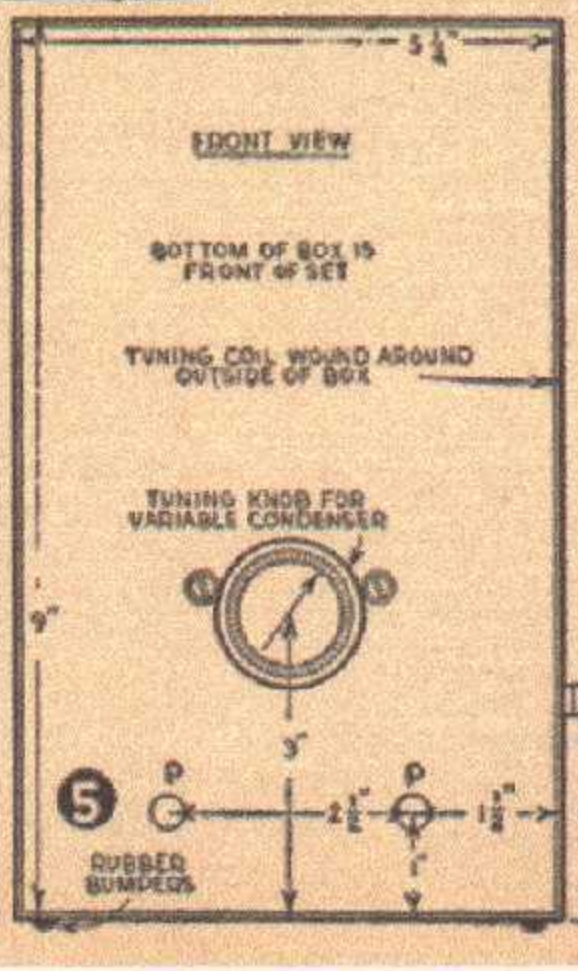
Interfering stations, which are at right-angles to the desired station, can be greatly reduced in volume simply by pointing the loop at the desired station with the loop broadside to the interfering station. In some cases, a loop crystal set will prove to be more selective than most crystal sets using a conventional antenna and ground, but don't expect the same sensitivity with a loop that you will get with a long outside antenna and a cold water pipe ground. A binding post on the side of the cabinet provides for an additional antenna for those living outside the range of the loop, and for those desiring to pick up more distant stations after the locals have signed off for the night.

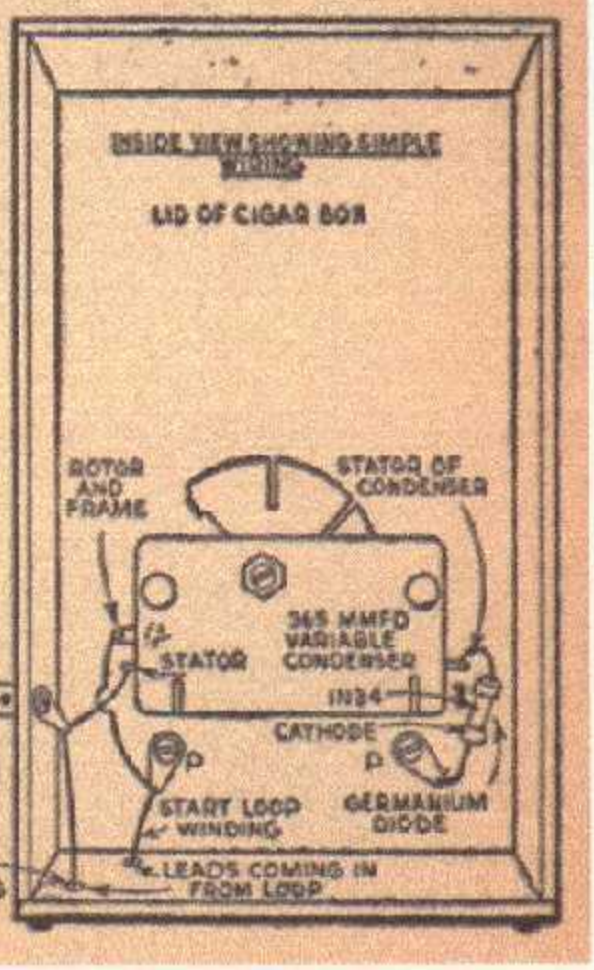
The extreme simplicity of this set is demon-

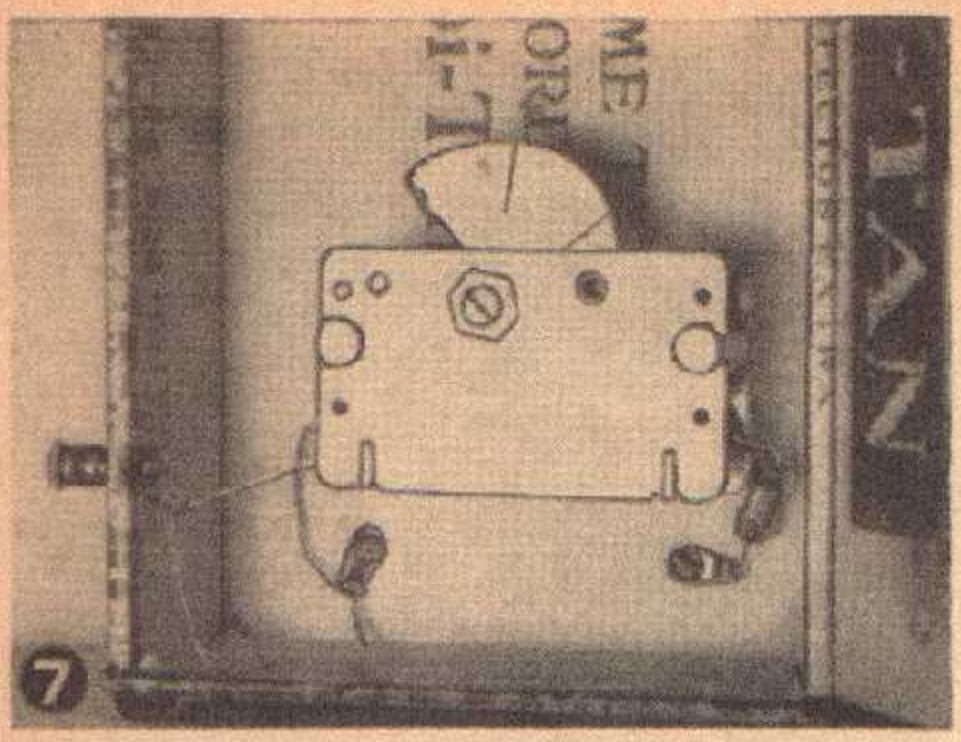




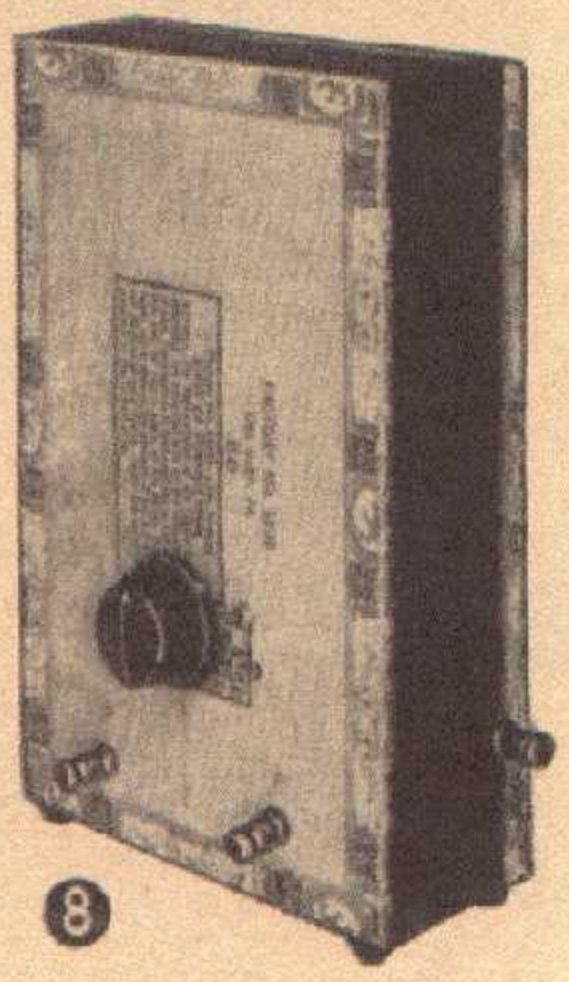








strated by the fact that the set shown (Fig. 1) was assembled and wired by a child under the supervision of the author.



This set differs from other crystal sets in that the tuning coil is wound around the outside of a cigar box to form a loop antenna (Fig. 2), instead of on a small Bakelite or cardboard tube inside the set. Figs. 5 and 6 show the simple layout for the 365 mmfd. variable condenser, the 3 post-type binding posts, or Fahnstock clips for the earphones, and the extra antenna connections. Fasten a soldering lug under the head of each binding post screw. Wind the loop, consisting of 23 turns of #24 gage enameled or double-cotton covered magnet wire, around the outside of the cigar box (Figs. 3 and 4). To start loop winding, connect to right-hand phone post (as seen from front view of set) and to variable condenser rotor and frame (Figs. 3 and 6). Then wind 23 turns clockwise around outside of box and connect the other end of loop to antenna post and stator of variable condenser. The width of loop winding will be about 1¼ in. with the turns spaced the diameter of the wire apart. Connect germanium diode cartridge from another variable condenser stator lug to left-hand phone binding post (Figs. 6 and 7). Mount a pointer knob or a graduated turning dial, on the variable condenser shaft, and tack or glue 4 small rubber bumpers onto the bottom of the cabinet. The set is now completed (Fig. 1).

Wind a few turns of Scotch tape over the loop wires to protect the wires (Fig. 8), or brush a couple of coats of shellac over the loop wires. The writer tried shunting a small by-pass capacitor across the phone terminals, but no improvement was noted. This loop crystal set will give you slightly more volume indoors than outdoors, due to RF energy picked up by induction from the house wiring circuit. There will be some variation in signal strength in different parts of the room and different rooms in the house, due also to the house wiring circuit.

Glue a disc of heavy white paper or thin white cardboard onto the panel under the pointer knob on the tuning condenser so you can log your stations. When an additional antenna is used, however, the log will shift somewhat due to the added capacity introduced into the tuning circuit by the antenna. A water pipe or gas pipe connected directly to the antenna post makes a very efficient antenna for picking up distant stations. To obtain better results on distant stations connect a water pipe to the antenna post and use a bed spring as a counterpoise. Connect the bed spring to the right-hand phone post, which is the other side of the loop.

If you use a variable condenser larger than the one specified, you may have to remove 1 or 2 turns from the loop in order to cover the entire broadcast band. If you use a smaller capacity condenser you may have to add 1 or 2 turns to the loop. It is best to use a condenser not smaller than 365 mmfd., which is a standard size for the broadcast band. A little experimenting will give the desired results.

MATERIALS LIST—LOOP CRYSTAL SET

1	5½" x 9" x 2½" cigar box
1	365 mmfd. variable condenser, single gang, any good make. The one used by the writer was made by Insuline
1	Sylvania 1N34 germanium diode, or any other sensitive crystal
50	ft. No. 24 or 26 enameled or double-cotton-covered magnet wire
3	post-type binding posts or Fahnstock clips
3	soldering lugs
4	small rubber bumpers
1	Bakelite knob or tuning dial for ¼" shaft