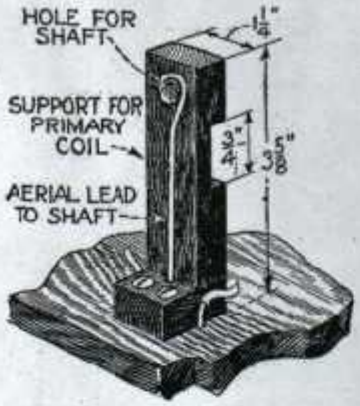
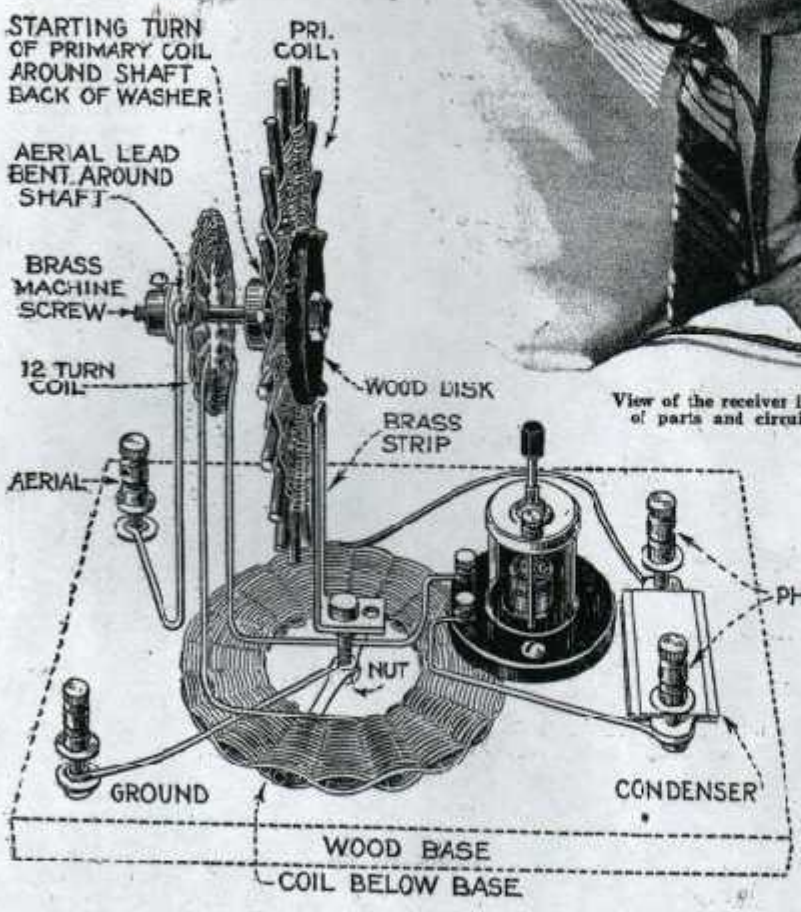
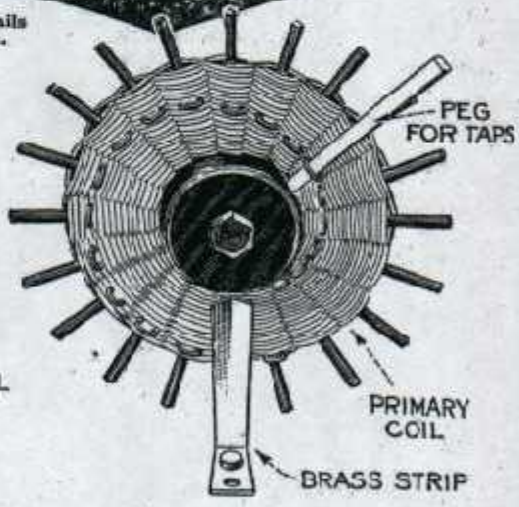
An Inexpensive Crystal Set

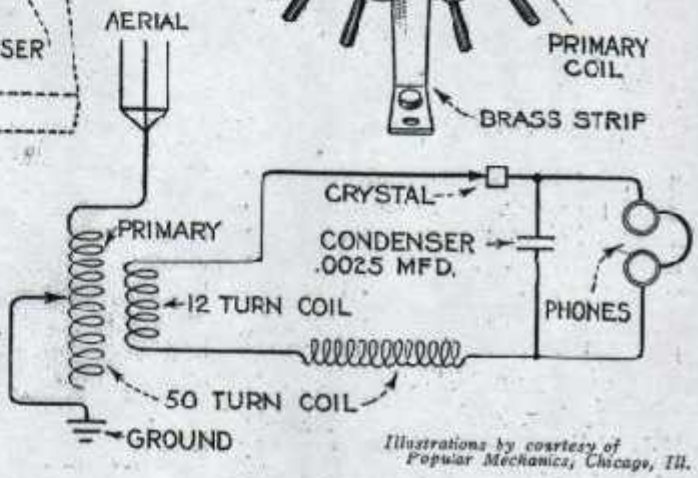
Local Broadcast Stations Can Be Received With Pure Tone Quality



View of the receiver in use, details of parts and circuit diagram.







Illustrations by courtesy of Popular Mechanics, Chicago, Ill.

THE crystal receiving set has much to recommend it when the purpose is to receive local broadcasting. This set is easy to construct and simple to operate. It costs little to build, does not require batteries and has a justly deserved reputation for producing clear, undistorted tone quality. The crystal set described below by *Will H. Bates* which appeared in *Popular Mechanics* magazine, has the additional advantage of being able to separate the "close together" stations, giving the sharp tuning usually obtainable only in vacuum tube sets.

This simple, selective crystal receiver will bring in the broadcast programs within a range of 35 or 40 miles, and can be built for less than $1, exclusive of the headphones and the aerial and ground supplies. No variable condenser is used, yet the set will separate the local stations. This is of particular advantage in the larger cities, where several stations are on the air at the same time, and the average crystal receiver will not tune sharply enough to give satisfaction.

For local stations, a few turns of bell wire around the room behind the molding will answer for the aerial, and a wire clamped to a water pipe makes an ideal ground. The revolving coil makes the set easy to tune. This primary coil is rotated with the finger as indicated in the illustration. It is mounted on the wooden support, detailed in the upper left-hand corner. The shaft is a 1½-in. brass machine screw, and if an old discarded rheostat

(*Continued on page* 152)

An Inexpensive Crystal Set

(*Continued from page* 150)

is available, its shaft, or that of a switch, will serve.

As the coil is turned, the taps are brought in contact with a thin spring-brass strip on the baseboard. The details of the primary coil are clearly shown and the winding is very simple. The form for the coil is the sawed-off end of a large spool, 1¼ in. in diameter. Holes are drilled in the edge for 20 burned-off matches, equally spaced. For the coil No. 22 d.c.c. magnet wire is used. Leave 1 in. or more at the beginning and wind over one spoke, under two spokes, and so on, for two complete turns. At the start of the third run insert a wood wedge to form a flat loop in the wire, as shown. When the turn is completed remove the peg. Every second turn on the coil will now bring the over-one turn on the adjoining spoke, and the peg is again inserted in the same way, thus advancing the taps in a spiral to the outer edge of the coil and forming 20 in all. The winding is then continued a part of the way around the coil, clipped and secured around one of the spokes. This end of the wire is not connected in the circuit; the loops are then scraped free of insulation and the spokes withdrawn from the coil. Heavy thread or light string is used to bind the coil, threading it in and out of the openings left by the spokes and tying the ends. The spokes are then re-

(*Continued on page* 154)

MATERIAL LIST

1 baseboard, ¼ by 7 by 7 in.
2 wood strips, ¼ by ½ by 7 in.
2 wood strips, ¼ by ½ by 6 in.
1 wood block, ½ by 1¼ by 1¼ in.
1 piece of wood, ½ by 1¼ by 3 in.
1 crystal detector.
1 .0025-mfd. condenser.
4 binding posts.
1 piece of thin spring brass, ⅜ in. wide and 2½ in. long.
1 brass machine screw, 1½ in. long, with nut to fit.
3 small washers.
1 small bearing with set screw.
1 large spool, 1¼ in. in diameter at ends.
1 small spool No. 22 magnet wire.

An Inexpensive Crystal Set

(*Continued from page* 152)

placed and the unit is complete and ready for mounting.

The starting wire of this coil is bared and looped around the shaft back of the wood disk, a large nut and washer holding it in place. The aerial wire is brought up through the base and looped around the shaft at the rear of the support, and held in place with a lock bearing and washer. The wooden baseboard is ¼ by 7 by 7 in. and rests on four ½-in. strips tacked around the outer edge, so as to allow the larger secondary coil clearance underneath it.

The secondary coil, in two sections, is wound on a form made from the remainder of the spool, the rim of which is drilled to take 19 nails, as shown. The smaller section has 12 turns and is mounted directly back of the primary, and supported by its lead wire but not touching the shaft, spaghetti tubing being used to strengthen the supporting leads. The inside lead of the small coil is taken through the baseboard to the inside turn of the larger coil, and the outside end of the small coil to one side of the crystal detector. Both sections of the secondary are wound with No. 22 d.c.c. wire, the method of winding being over two spokes, and under two. Leave a start and finishing end about 8 in. long, remove from the form and sew together as before. The second section of the secondary has 50 turns, and is made in the same way. It is supported below the baseboard by a thin strip of wood; the author used a paper soda straw. The brass machine screw that supports the spring-brass strip also holds the supporting strip for the large secondary and forms the grounding terminal from the primary through the metal strip. The brass contact strip is bent to form a ½-in. mounting piece drilled for the machine screw, and mounted on the baseboard so that it will make good contact with the primary taps when the coil is rotated.

The .0025-mfd. condenser is mounted across the phone posts, under the baseboard. The outside end of the large secondary coil is connected to one phone post, and the other phone post is connected to the other side of the crystal detector, completing the instrument.