

THE HOME RADIO

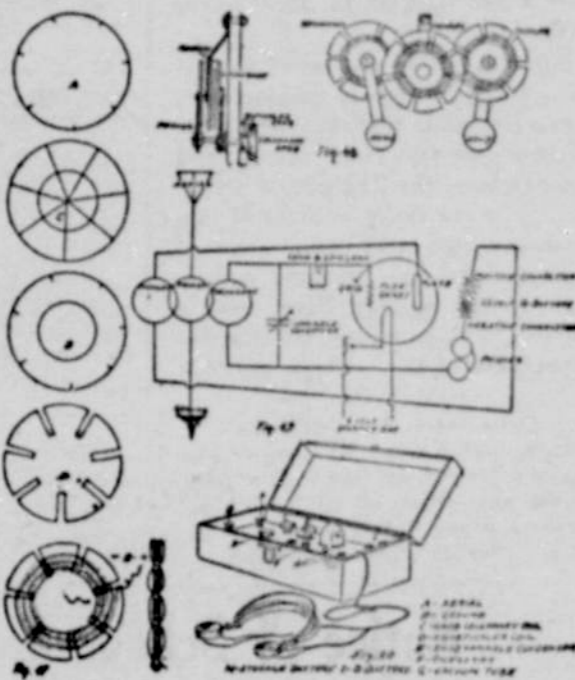
How to Make and Use It By A. HYATT VERRILL

XVII. LOOSE-COUPLED COILS

Coils, or, as they are more often called, tuning coils, are very essential parts of radio telegraphy and telephony. The old style tuning coil, as used in wireless telegraphy, has been largely superseded by the type known as loose-coupled coils or adjustable coils which may be altered or adjusted to tune much finer or more closely than by the old type coil. Although it is not difficult to make a loose-coupled coil yet, as is the case with many of the parts of radio sets, it is as cheap and far more satisfactory to purchase them ready made. The conventional type of loose-coupled coil consists of two distinct coils, one within the other, as shown in Fig. 46. One of these is the primary coil, the other the secondary or induction coil. The two are so arranged that the inner or secondary coil slips back and forth within the larger or primary coil, thus varying the coupling or induction, for the electricity—or oscillations—in the secondary coil is merely induced by the primary circuit in the outer coil, so that if a portion of the secondary coil is withdrawn from the primary coil, as shown in the figure, there will be less induced current and in this way tuning is accomplished. To allow of still finer adjustment, the primary coil is provided with an adjustable slider A, and the secondary coil has a multi-pointed switch B.

Another type of loose-coupled coil is arranged so that one coil revolves within the other; while another type, which is the simplest of all for the amateur to construct and gives the best results, is composed of three discs or coils "stagger-wound" which may be adjusted back and forth. To make one of these inductors you will require some stiff, smooth cardboard, heavy Bristol board, thin fibreboard or similar composition and about half a pound of No. 24 D. C. G. wire. Also, in setting up and arranging the coils, you will require binding posts, knobs, a little sheet brass and a few other odds and ends. With a pair of dividers or compasses draw three circles on the cardboard or fibre, each about four to five inches in diameter, having all exactly the same size. Then, using the dividers, scribe off an unequal number (five, seven, or nine) marks around the circumference of each circle. Fig. 47, A. Next, still using the dividers, draw a smaller circle, say one and one-half inches to two and one-half inches in diameter within each circle (B). If the circles are four inches in diameter use the smaller circle inside, if five inches the larger one, and with a rule draw radiating lines one-fourth of an inch apart from each of the marks on the outer circumference to the center of the circle (C). With a pair of scissors or a sharp knife (if cardboard is used) or a fine saw (if fibre), cut out the discs and cut slots in each disc according to the marks, as shown at (D). Next, if you have used cardboard, give each slotted disc a thorough covering with shellac, using at least three coats, and when thoroughly dry proceed to wind the discs or coils. In doing this, start the wire—being sure to leave enough for connections—at a point at the inner end of one slot and wind over one segment and under the next, and as the number is uneven you will find that the wires will thus cross, as shown at (E). The number of times the wire should be passed can only be decided upon by

experimenting after the coil is in use, but, as a starter, about twenty-five or thirty turns on one, about one and one-half times as many, or say thirty-eight to forty-five on the second, and twice as many on the third as on the first, or from fifty to sixty, will be somewhere near right. Then, by removing or adding a few turns, as you adjust your receivers you can finally secure the very best results. To mount this coil so it may be used, the coil or disc with the least turns, or, in other words, the primary coil, should be mounted rigidly and immovably and should be connected by means of binding posts to the aerial and ground wires. The secondary coil and the tickler coil should then be fastened to brass or metal strips about two or two and one-half inches long, one-sixteenth inch thick and half an inch wide. One end of each strip should be attached by small bolts or screws to the coils and the other end



attached to a movable peg or bolt with a fibre or bakelite knob at the opposite end. Fig. 48 shows clearly how this is done. In this way, the secondary and tickler may be swung back and forth to cover more or less of the primary; but great care should be used that the tickler does not touch the primary coil. When the coil is thus mounted on a proper panel or stand, it should be wired as shown in Fig. 49, and when the whole set is in good working order and final adjustments made, it should all be enclosed in a neat wooden case with a hinged top or cover, Fig. 50, although, of course, this is merely a protective measure and does not affect the working efficiency of the set. It must be clearly understood, however, that this type of coil can only be used in connection with a vacuum-tube outfit as shown. When all wiring is complete and adjustments are ready to be made, connect the storage battery, as shown; place the lamp or tube in its socket and gradually turn on the rheostat, to see if the tube glows properly. Never turn on the current to the bulb quickly or to full power, or the filament will be needlessly burnt out and wasted long before its time. Next, connect the B, (or dry) battery, the ground and aerial and, finally, the phones.

In using this outfit, turn on the bulb slowly, adjust the knobs carrying the coils so that all three are in line and then adjust or tune the variable condenser until the signals you wish to hear are clear. Then, by gradually adjusting the movable coils, you can cut out interference and also make the signals, music or other sounds louder. When the two movable coils are entirely away from the primary-coil you will have your shortest wave length, while when all three are together, you will have the longest wave length.

Original Estimate and Accounting Sheet

School District No. 95

This original estimate is made in compliance with section 231-A of the school laws of 1921 and shows in parallel columns the unit costs of the several services, material and supplies for the three fiscal years next preceding the current year, the detail expenditures for the last one of said three preceding fiscal years and the budget allowances and expenditures for six months of the current year. ("Six months of the current year" means six months of the last school year.)

EXPENDITURES

ITEM	Estimated expenditure for the ending school year	Expenditures and budget allowance for six months of last school year		Expenditures for three fiscal years next preceding the last school year		
		Expenditures in detail	Budget allowance in detail	Detail'd expenditures for the last year of the three-year period	Second year's yearly totals	First year's yearly totals
PERSONAL SERVICE						
2. Principals	\$ 2000 00	\$ 1000 00	\$ 1000 00	\$ 1833 26		
3. Teachers	1215 00	810 00	810 00	6374 97		
	1155 00	769 98	769 98			
	1080 00	720 00	720 00			
	990 00	660 00	660 00			
	990 00	660 00	660 00			
	1980 00	720 00	720 00			
4. Janitor	450 00	300 00	300 00	450 00		
5. Clerk	50 00	25 00	25 00	50 00		
7. Other services		53 30		9 25		
Total—Personal Services	\$ 9010 00	\$ 5718 28	\$ 5664 98	\$ 8717 48	\$ 8875 00	\$ 6933 12
MATERIAL AND SUPPLIES						
1. Furniture (desk, etc.)	\$ 275 00					
2. Supplies (chalk, etc.)	65 00	55 82	43 00	65 50		
3. Library books	80 00			296 65		
4. Laboratory supplies	50 00			11 35		
6. Janitor's supplies	25 00			252 50		
7. Fuel	150 00	25 00	100 00	40 95		
8. Light	28 00	53 90	24 00	5 00		
9. Water	12 00					
10. Postage and stationery	20 00	1 00	2 50	634 35		362 85
Total—Material & supplies	\$ 705 00	\$ 135 72	\$ 169 50	\$ 641 95	\$ 634 35	\$ 362 85
MAINTENANCE AND REPAIRS						
Heating plant	\$ 675 00	\$ 84 87	\$ 166 66	83 11		
Buildings and grounds	560 00					
Total—Maintenance & Rep.	\$ 1235 00	\$ 84 87	\$ 166 66	\$ 83 11	\$ 104 96	\$ 788 81
INDEBTEDNESS						
Interest on warrants	\$ 350 00	\$ 259 54	\$ 266 66	\$ 324 97		
Total—indebtedness	\$ 350 00	\$ 259 54	\$ 266 66	\$ 324 97	\$ 324 97	\$ 186 16
INSURANCE						
Total—Insurance	\$ 50 00		\$ 45 50	\$ 75 00		
	\$ 50 00		\$ 45 50	\$ 75 00	\$ 75 00	
MISCELLANEOUS						
Printing and advertising	\$ 5 00	\$ 13 45		\$ 4 85		
Supplies for D. Science	100 00	67 52		100 24		
Freight and hauling	20 00			18 38		
Total—Miscellaneous	\$ 125 00	\$ 80 97	\$ 87 00	\$ 123 47	\$ 118 47	\$ 164 62
EMERGENCY						
Total—Emergency	\$ 517 42					
	\$ 517 42					
GRAND TOTAL	\$11992 42	\$ 6279 38	\$ 7066 96	\$ 9965 98	\$10132 75	\$ 8405 56

I, Annie D. Bartu, do hereby certify that the above estimate of expenditures for the year 1922-1923 was prepared by me and that the expenditures and budget allowance for six months of the current year and the expenditures for the three fiscal years next preceding the current year as shown above have been compiled from the records in my charge and are true and correct copies thereof.

ANNIE D. BARTU, District Clerk.

A Lake on Shipboard.

When one contemplates that so much energy is exerted to the end of keeping the water out of a ship, it comes up as an astonishing fact that there is of necessity a great deal of water within the hull of the vessel. A modern liner has enough water in her hull to make a good-sized lake. About 1,740 tons of water is carried by a big passenger vessel. The drinking water for the use of passengers amounts to 500, and there are about 800 tons of sea water being used for ballast. The six boilers contain 360 tons. The tanks are situated between the double-bulls of the vessel.

Raisin Lacto.

Beat the yolks and whites of two eggs separately and add them to three cupfuls of sugar, mixed with two quarts of skimmed milk and 1 1/4 cupfuls of plumped and chopped raisins. When partly frozen add the juice of a lemon.

Strange Thing.

One of the strangest things in this world is why a woman will tell the neighbors her daughter can sing when their ears are perfectly obvious.—Dallas News.

We Do Dyeing:::

Hub Cleaning Works, Inc.

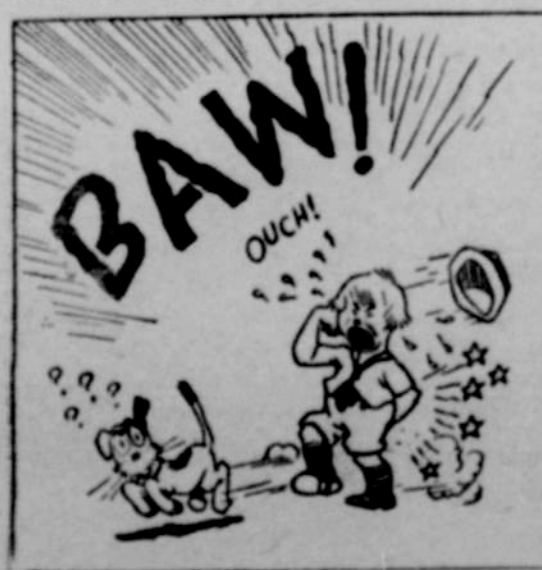
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RADIO RALF AND HIS FRIENDS---



By JACK WILSON

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