

**VALETTA SERIES**

**HOW TO MAKE**  
**A**  
**WIRELESS SET**  
**AT SMALL COST**

**Simple and Instructive**

**ILLUSTRATED**

**PRICE ONE SHILLING**

**Published for the Trade**

## CONTENTS

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	PAGE
INTRODUCTION ... ..	3
WHAT TO OBTAIN ... ..	4
APPROXIMATE COST ... ..	4
THE AERIAL ... ..	6
THE RECEIVING SET ... ..	8
THE COILS ... ..	8
THE TERMINALS AND CONNECTIONS ... ..	10
THE EARTH WIRE ... ..	12
LISTENING-IN ... ..	13
HEAD-PHONES ... ..	15

# HOME-MADE WIRELESS.

Simple and Instructive.

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## INTRODUCTION.

**I**N writing this booklet on how to construct a really effective crystal receiving wireless set, my chief aim is to describe every detail in the most simple language, so that you will not have the slightest difficulty to overcome. Further, you will be fully rewarded for the little expense, time, and energy you bestow upon your own made apparatus. Another feature is the low cost, for the set will not mean an outlay of more than, roughly, 10s., including the aerial, or outside wire.

You will be well repaid many times over. Is it not far more interesting to yourself to listen in upon your own made set and to proudly demonstrate to your friends the highly successful results of one's own labours?

Many people who would much like to attempt to make their own machine hesitate to do so, feeling that heavy outlay, no knowledge of the technicalities of wireless, and eventually failure confront them. If, however, readers will both carefully follow the directions and study the simple diagrams then they are quite assured of success and many hours of pleasure.

In writing this booklet, I wish it to be thoroughly understood that no technical and tedious words will be used. This is the purpose of this little work. The set herein described has been made by me within two hours with such perfect result that often six pairs of head-phones have been used at



the same time upon it, each person hearing distinctly and perfectly. It is so easy to construct that my son, aged 11 years, made one and manipulates it as easily as I do.

With this set I get the concerts of the London Broadcasting Station (2 L.O.); frequently pick up Morse signals from the North Foreland; also conversations and music of local experimenters, so that an evening's amusement is always assured. It must, of course, be understood, that this set will not carry more than 15 miles for telephony from a broadcasting station.

### WHAT TO OBTAIN.

Many of the following articles one can make, but as they can be purchased so cheaply from any wireless shop, I recommend the reader not to go to the trouble of making any of them. The chief advantage of this set is its cheapness, together with efficiency.

### APPROXIMATE COST.

Expensive parts are not necessary, as the annexed list will show. The approximate cost is also stated. The results will be just as loud and clear as from a £5 5s. set.

	s.	d.
100 feet of aerial wire, cost about ... ..	3	0
(Ask for seven strand)		
4 china insulator cups, cost about ... ..	0	2 each.
2 galvanised pulley wheels, cost about ... ..	0	4½ „
1 length of medium-size rope, say 24 yds., cost about	1	0
1 cardboard cylinder, 2½-in. diameter, cost about ...	0	2½
1 cardboard cylinder, 3-in. diameter, cost about ...	0	2½
2 ounces of 26-gauge cotton insulated copper wire, cost about ... ..	0	6
1 crystal detector, cost about ... ..	2	0
1 piece of crystal, preferably "Hertzite," cost about	1	0
2 brass round terminals, cost about ... ..	0	2 each.
2 brass round phone terminals, cost about ... ..	0	2 „

The total cost of the above, including the aerial wire, is, therefore, not more than 10s. approximately.

FIG. 1.

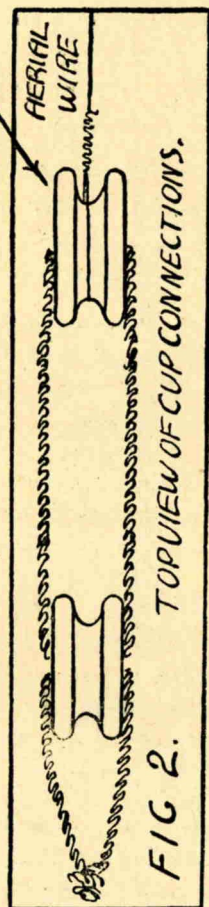
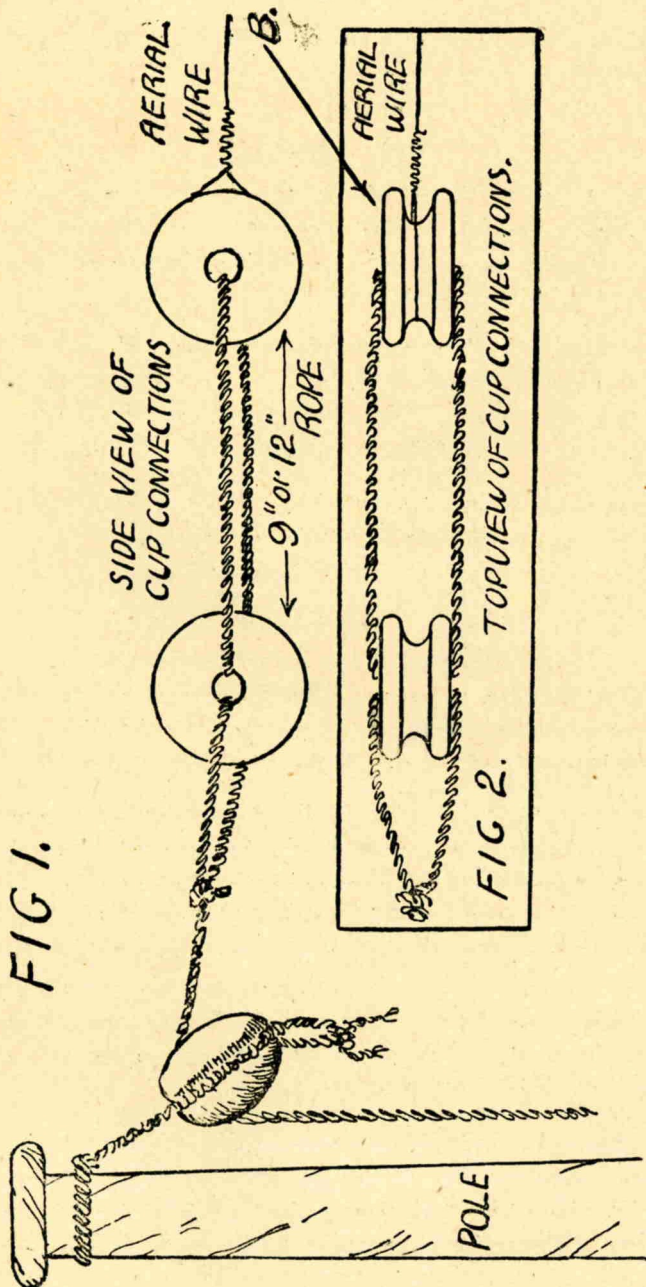


FIG. 2. TOP VIEW OF CUP CONNECTIONS.

You are now ready with all your materials to proceed with the making of your set, etc.

### THE AERIAL.

The first thing to deal with is the erection of your outside wire, called "aerial." For the purpose of making this easily I will describe my own aerial, which is a single one of about 70 feet long with a lead-in of 10 feet.

First attach firmly to an upright pole (height about 30 feet) one galvanised pulley wheel, upon which you pass through one end of the rope. Then make fast to one insulator reel by inserting the rope through and binding tightly as in Fig. 1.

Then from this insulator reel attach another short piece of rope (or galvanised wire if preferred), about 9 to 12 inches long, doubling it, making ends fast, as in Fig. 2.

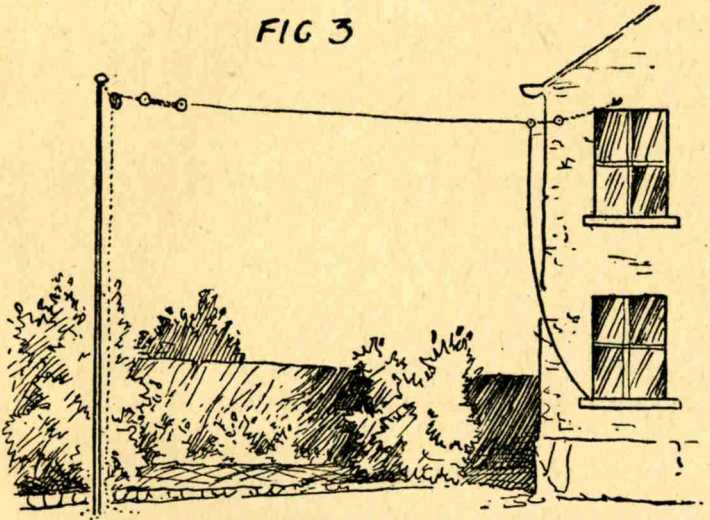
When this is done, proceed to wind one end of the aerial wire to the *grooved* part of the second insulator reel marked "B." You must be especially careful to see that the aerial wire does not touch any part of the rope or galvanised wire, otherwise no signals or sounds will be heard. Follow Fig. 2.

At this stage it is well to advise the reader not to uncoil more of the aerial wire than he can conveniently deal with. Wire is awkward material and quickly cockles and knots. If you can get a friend to help you all the better. Get him to hold the one end on the insulators while you slowly unravel the roll. The easiest way is to walk backwards from the pole gradually allowing the wire to unwind. Measure the distance your aerial will be, and on no account cut any part of the wire until advised later in these pages.

A good plan is to fix the second pulley wheel with rope already attached to the house just above the bedroom window, if this is convenient. (See Fig. 3.) But this time only twist the aerial wire once round the grooved part of the

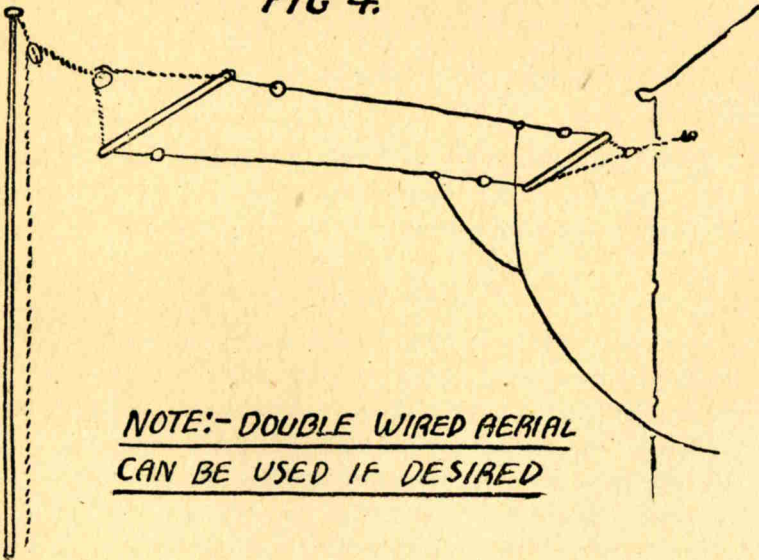


FIG 3



ASSEMBLY OF AERIAL (GENERAL APPEARANCE)

FIG 4.



NOTE:- DOUBLE WIRED AERIAL  
CAN BE USED IF DESIRED

cup. Then measure the distance you will require for your lead-in (that is the drop-in wire) and, having ascertained this, give another twist over to ensure it being firmly held close to the insulator reel.

Probably the reader cannot spare the length of aerial just described, in which case it will be necessary to have a double (called "twin") aerial. This must be built as Fig. 4.

Sometimes it is not possible for the aerial to be exactly horizontal, but it does not matter a great deal if the aerial slopes slightly *towards* the house. Always make your aerial as long and as high as possible. Another point to remember is, the quicker the lead-in wire the better the results.

### THE RECEIVING SET.

Having finished this part of your work, you are now ready to construct your receiving set.

Proceed as follows: First take your  $2\frac{1}{2}$ -in. cylinder and measure off 6 inches. Cut through the cardboard neatly and evenly, using a sharp knife. (See Fig. 5.)

Now cut off, *only* 3 inches from the 3-in. diameter cylinder. (See Fig. 5A.)

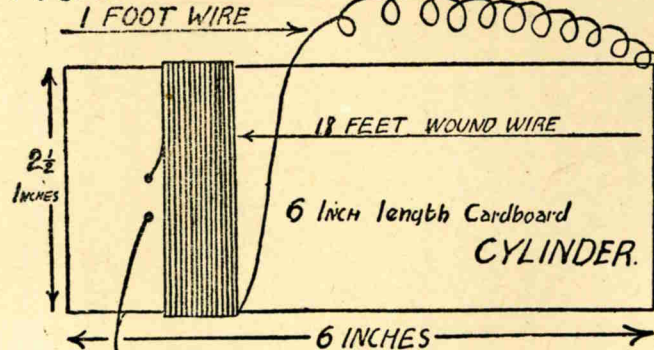
Both these cylinders are all the better if treated with a coat of insulating varnish. This is not essential, but advisable to prevent leakage of current.

### THE COILS.

Your next step is to carefully measure off 40 feet of the 26-inch gauge cotton-covered thin wire. The best plan is to measure exactly 20 feet, mark this spot with ink, and double the wire. The marked portion will be of great assistance to you presently. Be most careful not to allow the wire to twist or cockle, otherwise it may break, and, therefore, be quite useless. Now pierce two small holes about half-an-inch apart



FIG. 5



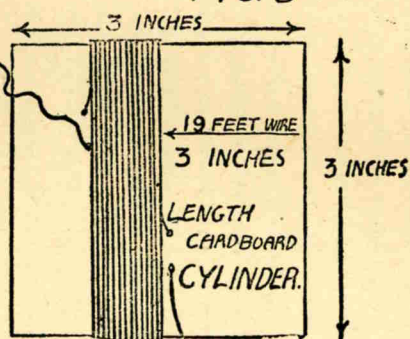
AERIAL TERMINAL



AERIAL CONNECTION



FIG. 5<sup>A</sup>



EARTH TERMINAL.



EARTH CONNECTION.



SHOWING WIRE CONNECTIONS

and 1 inch from edge commencing at the left-hand side of the  $2\frac{1}{2}$ -inch cylinder. Push one end of the wire down and then up through the second hole, pulling it slowly to the extent of 1 foot of the wire only. Now put your thumb over the holes to prevent this foot of wire slipping, and proceed to wind most carefully 18 feet of the wire round the cylinder. Be particularly careful to see that each coil is quite close to each other, also that in no place does the wire overlap, and no cockles in the wire. This is very important. Keep winding the wire until you have used 18 feet, then make two small holes close to where this coil finishes and push the *other* end of the wire down and up through. Gradually pull the rest of the wire (21 feet) through until the 18 feet are neatly and firmly fixed on the cylinder. Your cylinder should now look like Figs. 5 and 5A.

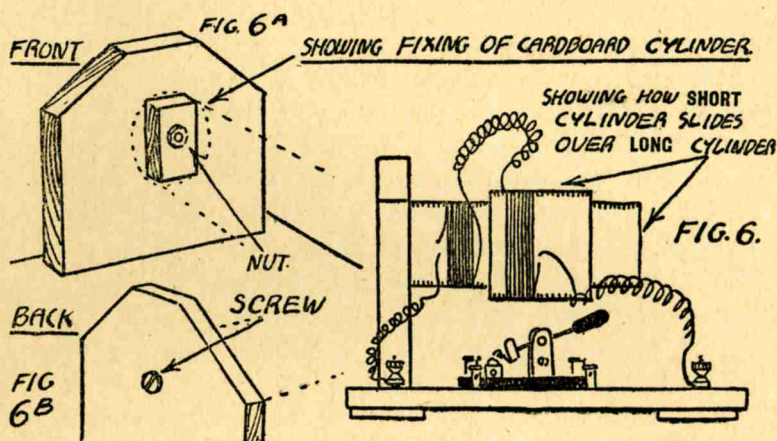
You now proceed to make two small holes in the 3-inch cylinder about  $\frac{3}{4}$  inch from edge, but first leave over 1 foot of wire clear—that is, commence from the spot marked by the ink and then wind 19 feet of wire on this cylinder. When you have used the 19 feet make two small holes, push wire down and up through as before. You now have 1 foot over, which will be for the “earth” wire. Its use will be explained later. Put the 3-inch cylinder over the  $2\frac{1}{2}$ -inch cylinder, and your coils will now be like Fig. 6.

All the wire should now be painted with an insulating varnish and left to dry, after which mount them on a 4-inch block of wood. To do this first fit in closely a small piece of  $\frac{1}{2}$ -inch wood just *inside* the  $2\frac{1}{2}$ -inch cylinder. Put two small screws, top and bottom, through the cardboard to make this cylinder a fixture. ~~Screw~~ the 3-inch block on to a platform or base. (See Figs. 6A and 6B.)

### THE TERMINALS AND CONNECTIONS.

Your next job is to fix in firmly the two brass round terminals. Place one of these on the extreme left-hand side

and the other on the right-hand side of the platform and in the front, say, 1 inch from sides, as marked "A" in Fig. 8. You also fix two phone terminals in the centre, marked "B." Now screw down your crystal detector in middle of the board. Get some of the 26-inch gauge wire, or ordinary covered bell wire, single strand, and cut three short lengths about 6 inches long. Connect the wires as follows (having first bared *all* the ends of the wire about 1 inch) by twisting round the base of the terminals. First take end of the 1 foot of projecting wire from the 2½-inch cylinder (left-hand side) and connect it to



left-hand terminal. This is the aerial or lead-in terminal. From this same terminal run one of the 6-inch lengths of wire and connect it to the terminal close to the cup containing the crystal. Before mounting the crystal detector take notice that underneath the brass cup which holds the crystal there is already a short wire showing. This is called the "crystal terminal." The other terminal of this contrivance is called the "detector terminal," and from this terminal you connect the second short length of wire to the left-hand phone terminal. The third length of wire you connect from the right-hand phone terminal to the extreme



right-hand terminal on the platform called the "earth terminal." Your set is now finished, and by studying the full-page diagram on page 14 you will have no difficulty in making your connections, etc., perfect.

### THE EARTH WIRE.

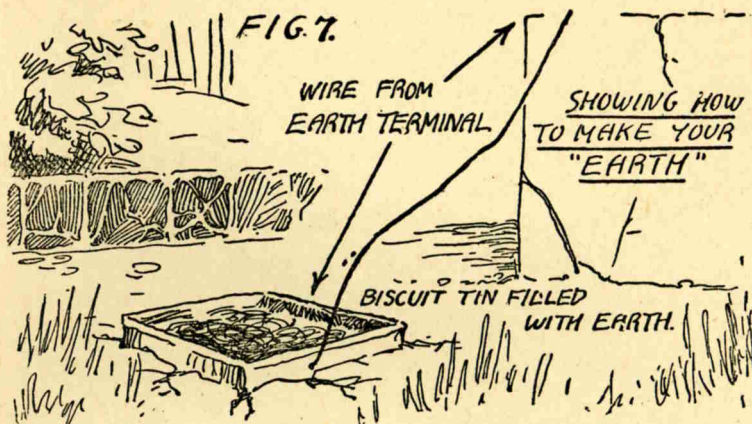
Now I will explain the earth wire. This is an essential part of the set, and too much care cannot be bestowed upon it. It is just as important to have a proper "earth" wire as the aerial, otherwise the signals will be distorted and faint. If you have a length of aerial wire over I advise you to use this, but if not buy a small length of copper wire, single-insulated if possible. Get an old biscuit-tin from a grocer and clean thoroughly a small portion of the tin and solder one end of the aerial or copper wire to it. If you are not able to use solder then make two holes in the tin, say 1 inch apart, thread one end through, passing it outside again, and twist the wire very firmly close to the tin so that it cannot move. Dig a hole  $2\frac{1}{2}$  feet deep in the ground close to the window where your earth wire will be taken, but keep as far apart from the aerial lead-in wire as possible. Do not have a longer earth wire than is necessary.

It is a good plan to fill the biscuit tin with sifted ashes and saturate them with water. Occasionally pour a bucket of water over the spot where the tin is buried, as it naturally helps to give clearer signals. (See Fig. 7.)

It is here advisable to give you a word of caution. Under no circumstances whatsoever attach your "earth wire" to a gas pipe or electric cables.

Connect this earth wire to terminal on the right-hand side of your platform. The window can be closed down on this wire, so long as it does not cut through it. From the other left-hand terminal you attach the aerial lead-in wire. You must be particularly careful to see that this lead-in wire does

not touch anything except the terminal. To avoid this it is better to purchase a lead-in tube, cost of which is not more than 1s. 6d., and made specially for the purpose. The outlay is small, and I strongly recommend it as it saves a great deal of trouble and is easily fixed to any window. Should you decide to use one it will be necessary to have a short piece of insulated wire running from the inside terminal of the lead-in tube straight on to the left-hand terminal of the machine.



The tin must be buried  $2\frac{1}{2}$  feet deep and completely covered with earth. Diagram is shown exposed, to make method of fixing perfectly clear.

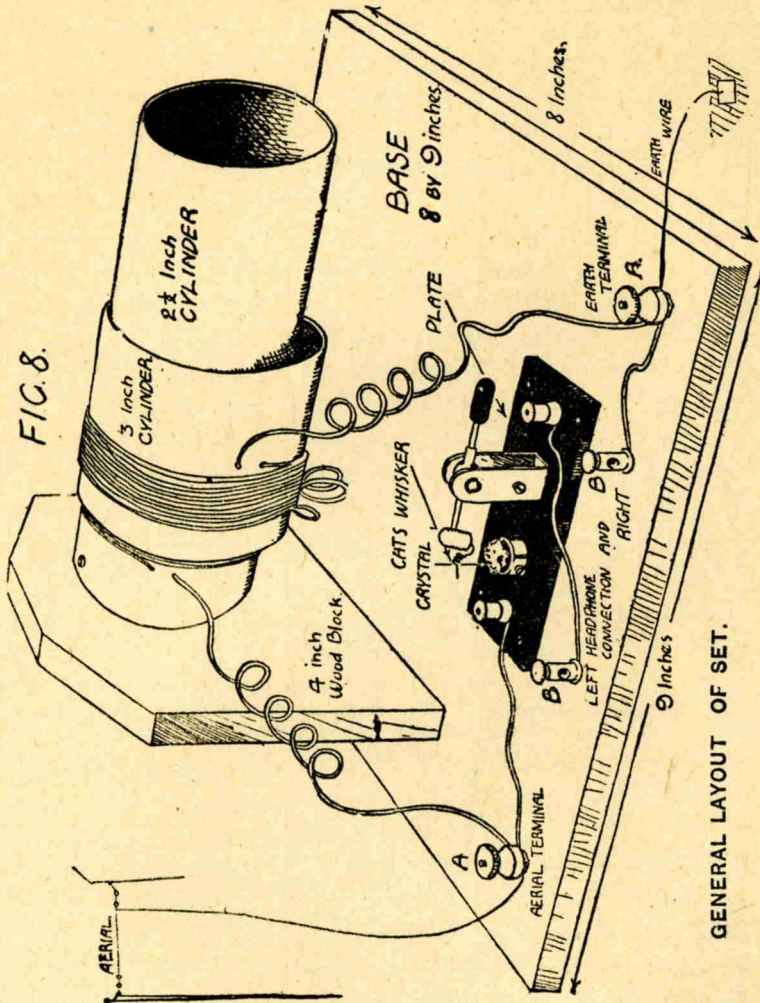
### LISTENING-IN.

To listen-in you will find a small spring wire attached to the handle or lever of the crystal detector. This is commonly called a "cat's whisker." You press this gently on to the crystal, and with the left hand move the 3-inch cylinder slowly towards the left, and you will begin to hear faint signals. By continuing to move it you will find the sounds becoming stronger. When they are quite clear leave it in this position and return to your "cat's whisker," trying various parts of the crystal. Every crystal has a most



sensitive spot, and by a little searching and patience you will find this easily. The crystal must be kept firmly in the cup.

In conclusion, just one word of advice : always disconnect



your aerial lead-in and "earth" wires when the set is not in use and place these two wires together in case of a thunderstorm, otherwise your machine is liable to be destroyed.



## YOUR HEAD-PHONES.

The question of the head-phones must be left entirely to the wishes of the reader. I, however, advise you not to purchase a cheap pair, as by doing so you will undoubtedly lose the volume of signals necessary to an evening's enjoyment. I advocate buying them at not less than 25s., and if possible on approval. Phones vary a great deal in their manufacture.

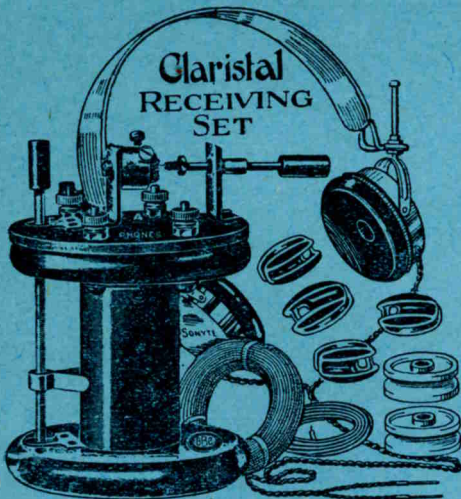
The large picture (Fig. 8) shows you all the details, how to wire one connection to the other; follow them carefully and you cannot possibly make a mistake. When the reader has become accustomed to the set, you can then make it look nice and neat by putting the connecting wires underneath the base. By staining the wood it will also give it a better appearance.

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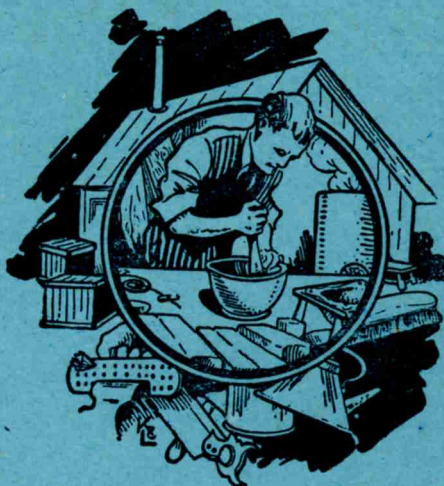
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It is hoped that the numerous illustrations will aid largely the descriptive text and render the method of making the large number of marketable commodities readily apparent. These embrace such varied crafts, that amongst them should be found subjects suitable for every class of Worker, in whatever direction he should be naturally equipped.

## CONTENTS.

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