Simple Polarity Indicators

Some Easily-applied Tests

WITH the present-day fairly general use of battery chargers and mains units a simple method of determining the correct polarity of mains becomes a necessity. An accumulator incorrectly connected to a charger and left in this way for a few hours may be permanently ruined. In the case of B battery eliminators operating from A.C. mains the output terminals are, in most cases, marked in some way. With certain commercial chargers the practice is to bring out flexible leads and stamp the connecting spade tags. Sooner or later these tags become corroded, and it is difficult to determine the positive and negative leads.

Some form of polarity indicator would therefore appear to be a necessity for every power-from-the-mains wireless user. It is extremely difficult to determine from inspection of twisted flex the relative polarity of the two leads. The easily-applied tests include (1) voltmeter; (2) water test; (3) potato test; (4) chemical test.

In the first type a voltmeter of the moving-coil type may be used, for with this class of meter a reading is only obtained when the positive of the supply is joined to the positive terminal on the meter. If the meter is incorrectly connected the needle will tend to move in the wrong direction.

The water test is quite simple, but it is apt to be misleading. The output leads of unknown polarity are placed in a slightly acidulated solution about one inch apart. Bubbles of gas will be given off from the ends of both wires, but at one end the gas is produced in much greater quantities. This lead is joined to the negative terminal of the supply. In practice the faults to be found with this test are: it is messy, and it is sometimes difficult to determine the lead from which the gas is liberated in the greatest quantity.

Should it be necessary to test polarity across two points between which a high voltage exists, a resistance, such as a lamp, must be inserted in series with one of the leads to prevent a possible short.

A freshly-cut potato with the two leads stuck a small distance apart is the third type of polarity indicator. The current passing through the potato between the two ends of the wire causes a green stain to be left on the wire connected to the positive of the supply. But as a certain amount of mark is also often left on the negative lead, this test does not give as definite an indication of the polarity as could be desired.

The last and most effective polarity indicator is the purely "chemical" type. Indicators of this type are extremely easy to construct, they are practically indestructible, and give a definite indication as to polarity. Obtain from a chemist some sodium sulphate and some phenolphthalein (about three-penny-worth of each). Half-fill an old tumbler or cup with warm water, and into this place as much of the former substance as will cover two pennies and sufficient phenolphthalein to cover a sixpence (not six pennies), and stir.

It will be found that these two chemicals will not dissolve, but merely form a suspension. Test the solution by placing two leads from a 2, 4, or 6-volt accumulator into it (about 1in. apart), and it will be seen that the negative lead turns the surrounding liquid a reddish colour. A slight shake causes the colour to disappear. By carefully adding very small quantities of each chemical in turn a point will be arrived at where the liquid is sensitive to 2 volts.

A suitable container for the liquid is the next consideration, and for this a length of glass tubing 2in. long with a ¼in. bore, two small corks, and two terminals are required. To increase the surface contact, small pieces of sheet nickel, brass, or copper are soldered to the ends of the terminals.

After filling the tube with the solution, leaving a space so that the liquid can be shaken to disperse the colour, carefully seal the corks with paraffin wax or Chatterton's compound. The excess liquid should not be thrown away, for with this pole-finding paper can be made.

Obtain some good quality white blotting paper and cut into thin strips, immerse in the liquid until thoroughly impregnated, and then hang up to dry. Do not attempt to dry in front of a fire. To use, moisten the paper slightly and then place the wires about ½in. apart on the wet portion, when the negative lead will leave a red mark.

Radio in 1909

Then in Infancy

IT is nearly thirty years since a small band of enthusiasts made a transportable receiver, writes a correspondent to "World Radio." It was wheeled round the streets on a barrow—there were no motor-cars to help.

It was like this. Marquis (then Senatore) Marconi had a mysterious house with a pole on the West Cliff at Bournemouth and was trying to call the Isle of Wight.

If a big man like that could communicate for miles, why should we not try a few yards?

So we started. First efforts—to get a throw of a galvo when a Rumkorff coil sparked; we had not much material and no great possessions.

The experiment worked across a table—good luck. Emboldened we constructed a Branly coherer; spent hours filing steel, nickel and silver; sifting the filings and mixing them in various proportions. Then brass rods had to be cut and filed to fit a glass tube—patience. Patience and bad words when sealing the glass!

But the coherer worked, and this made us arrange our transportable as we were getting beyond our neighbour's gardens. Components: A barrow, bamboo rods, some yards of aerial and earth wire and a spike to stick in the earth; two receivers. Receiver No. 1.—A tapping coherer of the Branly type, and No. 2, a Popoff automatic carbon coherer. The first worked like this. Morse signals worked at home by a six-inch spark coil, the sparks fattened by Leyden jars and bed-post brass knobs, were received on our improvised aerial; the oscillations passed to earth through the tube of filings which partially stuck together and conducted a current better. Across the coherer was a relay circuit, as delicate as our crude methods would allow. A few milliamps worked the oracle. The relay operated an electric bell and the back stroke of the hammer whacked the tube and decohered the filings—shook them up.

This was a poor arrangement for the spark at the bell contact itself cohered the filings and a mechanical spring tapper had to be arranged. The relay did heaps of things besides ringing a bell—exploded gunpowder, started a motor or anything else that could be started by an electric current. And many a practical joke did we play "at a distance" with this receiver. The other receiver was a Popoff carbon and steel arrangement and this required no tapping, but would do no tricks except receive Morse signals. It was connected just as the more recent crystal and carried a small current from a couple of dry cells. Buzzing signals were heard in 'phones placed across it. We had no variable condensers or tuning coils. Even in high places in those days, tuning consisted of tapping a coil of wire on a wood frame.

So we trundled along, erecting the pole in some dark or deserted corner; we were not escaping a Post Office license, but avoided as far as possible the interference of youngsters. We progressed a little farther from home each trip and reached about a mile with our portable, and became of such importance that we were allowed to visit and photograph an early Marconi station—and spoke in Morse twenty miles across the ocean!

The lone operator was glad to receive visitors, but equally glad to come and have refreshment at the nearest country "house." Messages were scarce. When asked about lightning—"atmospherics" were not invented then—he said that when the sparks on the aerial reached more than an inch long he just cleared out. We took all this information in—in those days.

Hanging an aerial out of the window and listening to faint Morse was a slow job in 1900.

Cave-man Husband (sternly, to wife who has been shopping): "What do you want with a new frock?"

His Wife (happily): "How thoughtful of you, darling! Of course I'd like a new hat with it."