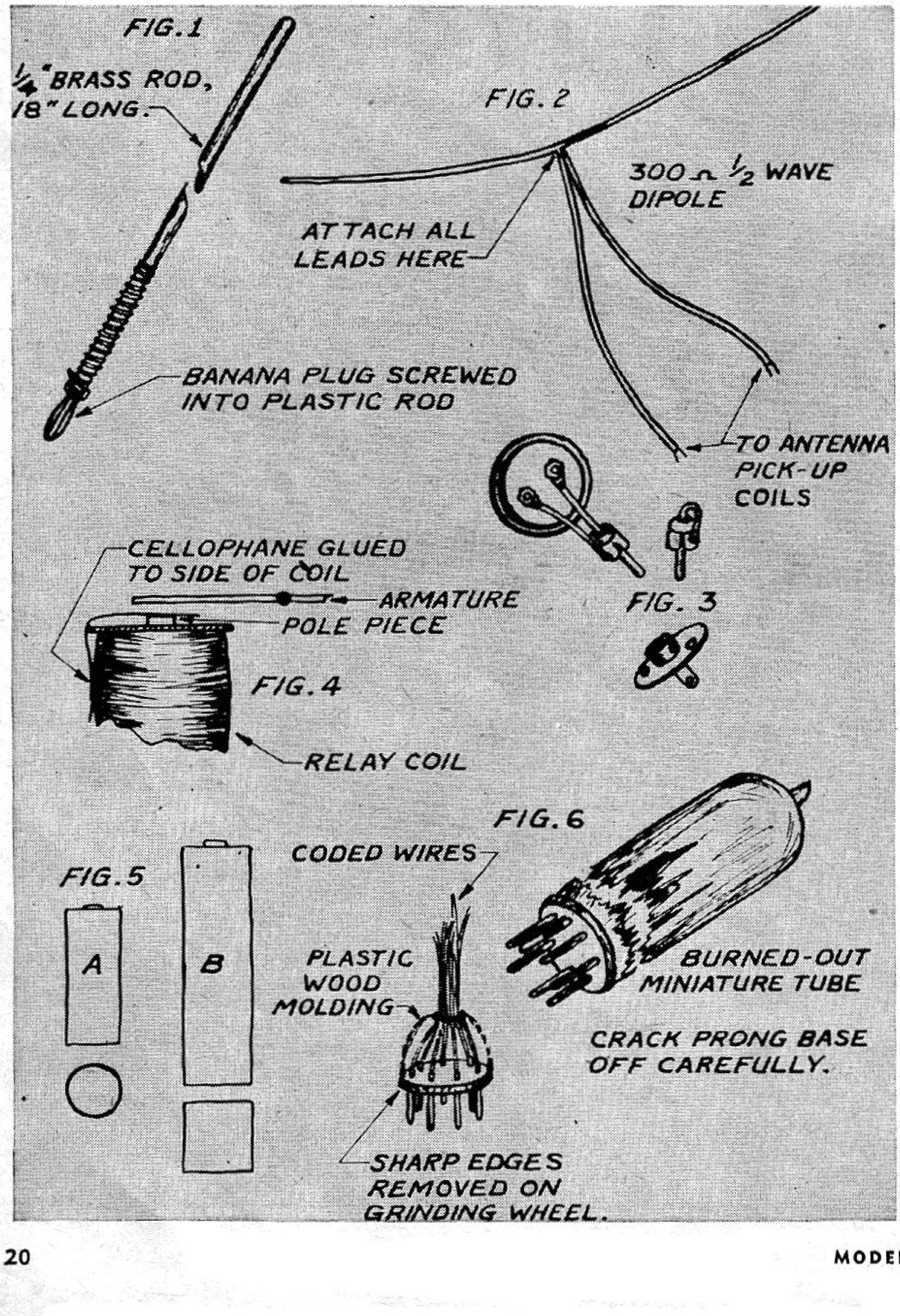
Radio Control Kinks

Hints to help your radio control work

by E. J. LORENZ

THERE have been numerous inquiries as to various hints and kinks concerning the latest phase of model building, radio control. We'll try to iron out a few of those kinks for you and supply some hints, too, so that you can get on with your warm weather building.

The first item in Fig. 1, is for a strictly portable antenna for radio control transmitters. This antenna will fit any transmitter operating between 50 and 54 megacycles, which covers just about all the commercial units on the market today. The materials needed are: one banana plug; a 4-1/2″ length of polystyrene or lucite rod (fibre or hard rubber could also be used) 1/4″ in diameter; one 18″ length of 1/4″ thin walled brass tubing, and about 3 ft. of No. 18 bare or enameled copper wire. One end of the plastic rod is drilled so that the banana plug can be screwed into it. The other end has a shoulder cut or filed on it, 1/2″ long, so that the brass tubing will fit over it. Solder one end of the length of wire to the banana plug, taking care that the heat is not applied too long or it will melt the plastic rod. Next, wind 25 turns of the No. 18 wire around the rod, spacing the turns about 1/8″ apart. This should cover the length of rod up to the metal rod. Make several turns around the brass tubing and solder.



The theory of this antenna is that of a 1/4 wave vertical radiator. Alterations should be made on the transmitter to make the antenna circuit suitable for this antenna. Instead of two leads going into the transmitter, as is the case with 300-ohm antenna feeders, one end of the antenna pick-up coil is grounded to the case and the antenna is connected to the other end. This antenna will give good results over water for distances of from 600 to 800 feet, over ground for more than 1200 feet, and in the air for about 1/2 mile, which is more than is usually needed for the control of a model.

Fig. 2 shows how two or more transmitters may be used on the same 300-ohm dipole antenna, such as is normally used with the Beacon and Aero-Trol transmitters. Attach the second or third lead at the junction as shown in the sketch. This will give good results with no interaction; however, only one transmitter can be used at one time.

Fig. 3 shows a lightweight meter jack for plane installations. One phono jack and two plugs are needed. The phono jack is fastened in the plane and connections properly made (the jack is inserted in series in the 45-volt "B" plus lead). One plug is shorted out, between the prong and the outer metal piece, by a piece of wire soldered in place. The other plug is connected to the meter with convenient lengths of wire (keep them as short as possible), making sure the polarity on the meter is correct. In use, the meter plug is inserted in the jack and the receiver adjusted. When the plug is removed and the shorted plug inserted, the circuit is closed and the receiver operates normally. This makes a very lightweight means of inserting the meter without removing wires to take a reading.

Fig. 4 gives the remedy for sticking relays. Sticking happens occasionally when the relay armature is pulled down directly onto the pole piece. By closing the magnetic circuit in this way, a slight residual magnetism is created. When the relay is set for very sensitive action, this residual magnetism is sometimes enough to prevent the armature from being pulled away from the pole by the spring. A thin piece of cellophane, such as from a cigarette package, about the width of the armature, is slipped between the armature and the pole piece. This prevents the two pieces from making direct contact and thereby assures proper operation of the relay.

Two new batteries that have come on the market recently are shown in Fig. 5. Cell A is a subminiature pencell type manufactured by the Brownie Mfg. Co. of New York City. These cells can be obtained from the company at a cost of 15c for two. The B cell is the new Sonotone hearing aid 1-1/2-volt "A" cell. The length is the same as a regular pencell, but instead of being round in form it is square. By adding the extra volume of the corners much longer life is obtained. Of these two new cells, the author has had a chance to test only the Brownie. The results were amazing for such a compact source of 1-1/2 volts. By using an RK-61 tube as the load, this cell went from a starting voltage of 1.56 volts (no load voltage was 1.7 volts) down to 1.12 volts in 1 hr. 10 min. This is much better than was obtained in other tests using the regular larger sized pencells.

A very compact and lightweight plug and jack unit for receiver or booster connections is shown in Fig. 6. The jack

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section of this unit is a regular 7-prong miniature tube socket of either the molded or wafer type. Since these sockets are made for miniature tubes and there are no regular plugs made to fit the sockets, why not use a miniature tube base for the plug? Take any burned out miniature tube and *carefully* crack the glass away for about 1/8" from the bottom. The ragged edges can be smoothed down on a grinding wheel. After the glass base with the prongs is free of the internal connections, solder thin insulated wire to each short prong, color-coded wire preferred. Then mold plastic wood around the wires and on the base to form a neat looking plug, with perhaps a small finger grip to facilitate handling. This makes an ideal booster plug and jack arrangement, where 5 or more separate voltages may be needed at the same time. It can be used in the plane also as a quick-disconnect feature on the receiver. Make proper battery connections to the socket and then wire the receiver and relay connections to the plug. In this way the entire receiver can be connected and disconnected with absolutely no trouble and with no loose wires dangling around.

In closing, we would like to stress again the importance of neat and "uncomplicated" wiring. At a recent meet a contestant lost control of his radio job just as he was doing an excellent job of maneuvering. Fortunately the plane was recovered and no damage incurred. The trouble was caused by a wire that had come loose from its connection. Use Fahnstock clips or the plug arrangement just described, and make sure all connections are properly soldered. Be sure the batteries you use are fresh and check them from time to time, preferably under load, to make sure they do not fall less than 10% under their rated voltage. 10% under the rated voltage of a battery is a good conservative figure for efficient operation.

Keep plane batteries firmly anchored, since they will do quite a bit of damage if knocked loose in a hard landing or crash. All in all, radio control is doing quite well considering restrictions imposed on this fascinating phase of model building. Some day, and we hope it will be soon, we'll have regular "National Air Races" with radio controlled models making ground pickups and cutting pylons. At present the model builder can help himself and model aviation in general if he concentrates on developing new methods of mounting receivers, making battery boxes (it's not as simple as buying a readymade battery box) and working out new mechanical control devices.