lugs or to wire leads. If you purchase a new transformer, you'll find that lead connection instructions are printed on the box, on a label on the transformer, or on a separate sheet. But if you have a transformer salvaged from another project or taken from a piece of used equipment, these connections probably will have to be determined anew.

If the unit is of recent manufacture, and equipped with color-coded leads, you can identify the leads by referring to the standard power transformer color code given in Fig. 2. Filament center taps are not included in all transformers.

If the transformer is not equipped with color-coded leads, a simple technique will indicate which is which. With the transformer disconnected, use an ohmmeter to determine pairs of leads and center-tap connections. Check the resistance of each winding. The winding having the highest resistance is usually the high-voltage secondary and may read from 25 to several hundred ohms. The winding having a medium resistance—generally from 5 to 25 ohms—is the primary. Finally, the lowest resistance windings, usually less than 1 ohm, are the filament windings.

Having made a tentative identification, connect a standard 100-watt lamp in series with the leads chosen as the primary leads and a source of line voltage as in Fig. 3. The lamp should light, but not at normal brilliance. If it lights to normal brightness, either the transformer is shorted (and should be discarded) or you've made an error in choosing the primary leads.

Next, using an a.c. voltmeter, check the voltage across each winding, *including the primary*. The ratios of these voltages will help you to identify the windings.

As a final step, remove the series lamp, applying full line voltage to the transformer primary. Use your a.c. voltmeter to check the unit's output voltages and to identify each winding positively. Remember that the voltage will read slightly higher than normal because of the absence of a load.

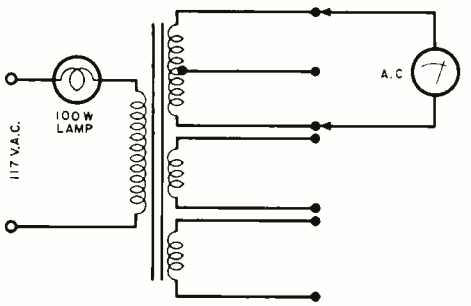

Fig. 3. Basic test which you can make to identify power transformer windings using an a.c. voltmeter.

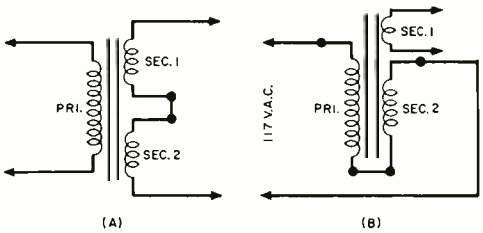

Fig. 4. Two tricks to use in making emergency substitutions: (A) two filament windings can be connected in series to supply higher voltages; (B) a filament winding can be connected in series with the primary to lower all secondary voltages.

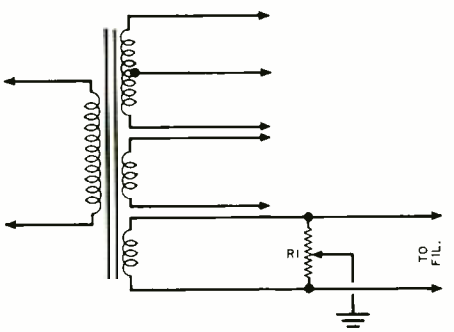

Fig. 5. How to obtain an "artificial" center tap on a filament winding.

Making Substitutions. A substitute power transformer should be used *only* if the specified component is unobtainable.

(*Continued on page* 145)