

# Home-Made Coils for the Browning-Drake and Similar Circuits

Concluding A Description of Easily-Constructed Coils and Their Forms

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## PART II

The keen experimenter and the "Doubting Thomas" cannot do better than begin with a modest two-tube set, consisting of R.F. stage and detector. When this is working properly, the fan has mastered the most tricky part of the set and the final set will give no trouble. The addition of an audio-frequency amplifier should not be a difficult matter.

Whether you will use home-made or commercial coils, for the "final" set, depends entirely upon your skill and the time you are prepared to sacrifice to experiments. With commercial coils you can be sure of good results with least effort.

The patient and skillful worker will be able to turn out splendid home-made coils for the finished set; particularly if he has gained experience by constructing a small two-tuber to begin with. This personal ex-

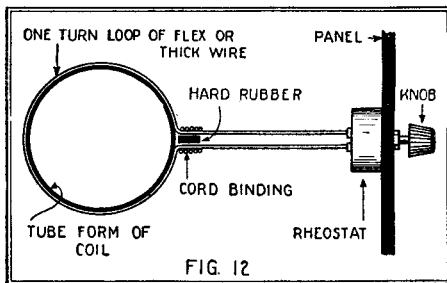


FIG. 12

This illustrates the method of rheostat-re-generation-control, described in Part I (December, 1926, RADIO NEWS).

perience will stand him in good stead when building other sets, of whatever type they may be. Best of all, he has the feeling that he is working on his own and getting away from the beaten track; and there are many of us who prefer to do some pioneering in our own little way.

During the past six months, the writer has built many experimental Browning-Drake sets, and he has come across some possible improvements—as yet not fully developed—which may be of interest to brother fans.

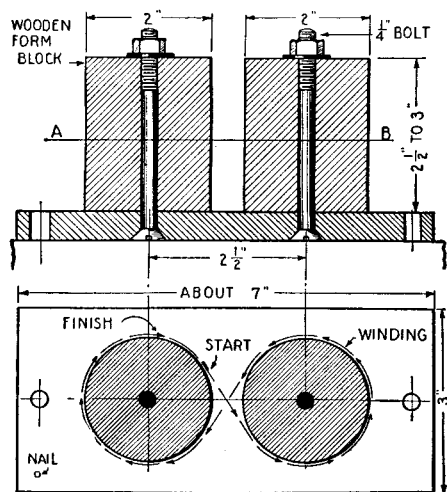


FIG. 16

Above is illustrated a form for winding "figure-8" coils, which is easily constructed and handy to use.

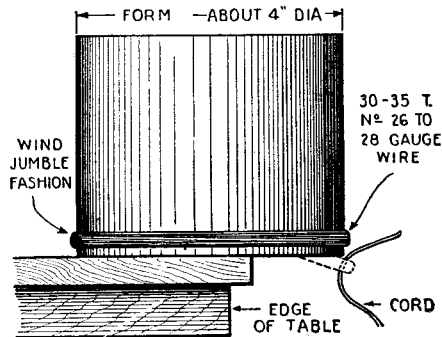


FIG. 13

Illustrating the initial step in the preparation of the "figure-8" coils; the "jumble" winding on a 4-inch cylinder.

### FIELDLESS (FIGURE-8) COILS

To eliminate the necessity for lining up the coils, and to make the set more compact, various types of fieldless coils were tried as antenna coils. Some of them proved remarkably successful.

If we wish to retain the high efficiency of the Browning-Drake R.F. transformer coil, with its solenoid winding and the slot-wound primary, we must leave it as it stands at present. But the antenna coil can advantageously be a fieldless coil.

Such coils can be made very small, and it becomes possible to mount them underneath the sub-panel, leaving the top free for tubes and other parts. Toroid coils are "big fellows," consequently unsuitable for our purpose. But the simple "figure-8" coil fills the bill.

Figs 13 to 15 show the gradual steps when constructing a "figure-8" coil which is perhaps the easiest to make. First of all, we need a winding form about 4 inches diameter; the writer used a tobacco jar that happens to be of the right size. It has a wide opening and a very good grip can be obtained on it when winding the coil; a point of some importance when working single-handed.

The experimental coils are wound with D.C.C. wire of No. 26 gauge and enameled wire of No. 28 gauge; other sizes may prove as good or even better. Leave sufficient wire for the connections, and hold the beginning of the winding against the outside of the form with your thumb. Now wind on about thirty to thirty-five turns of the wire; this is the secondary.

Without cutting the wire, make a long loop and continue winding for another ten or twelve turns, and we have the primary. The latter is of course needed only if we decide to use a semi-aperiodic primary.

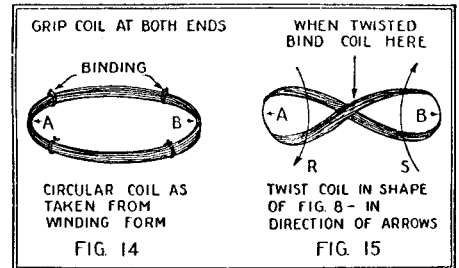
### FINISHING THE COIL

Twist beginning and end of winding together to hold the wire in position and place the form with the coil on it on the table, the front edge of the form projecting about two inches. (See Fig. 13). Gently work down the winding till it is clear of the form, and pass a short piece of cord through the gap. Replace the wire on the form and secure the ends of the cord with a knot. Repeat this in three other places; the coil can then be slipped off the form and we have a ring-shaped self-supporting coil.

It is not exactly a low-loss coil, as the turns are close together, but still it proved very efficient on test. When winding, two points should be watched; the wire must not be wound on too tightly, and an effort should be made to produce a "jumble" winding by varying the angles of its windings. Then the wires cross and re-cross at a slight angle, and the self-capacity will be kept reasonably low.

To form the "figure-8" coil, twist the coil into this shape while holding it at opposite ends. (Fig. 14). The completed coil will resemble that shown in Fig. 15. Where the winding crosses over the coil should be bound with thin cord or tape to prevent it springing back again.

The result is a self-supporting coil of the fieldless type. Such coils could be fixed to the under-side of the sub-panel by placing a narrow strip of hard rubber or thin wood across it; two wood screws passing through



When the wire has been taken from the form (Fig. 13) it is twisted, as shown here, to form the fieldless coil.

clearance holes in the ends of the strip will hold a coil securely in position. If a hard-rubber strip is used, small terminals can be fitted to it to facilitate connections.

### "DOUBLE PICKLE-BOTTLE" COILS

Another excellent fieldless coil that can be readily made is the "double pickle bottle" coil. It is wound over a double form of either circular or hexagonal cross-section. Fig. 16 shows the double form in detail; the form blocks have here a circular cross-section.

Two short round pieces of wood are bolted to a small baseboard, and long bolts pass through clearance holes in the forms and hold them firmly. The winding direction is indicated by the arrows in the plan view. Winding can be carried out with more com-

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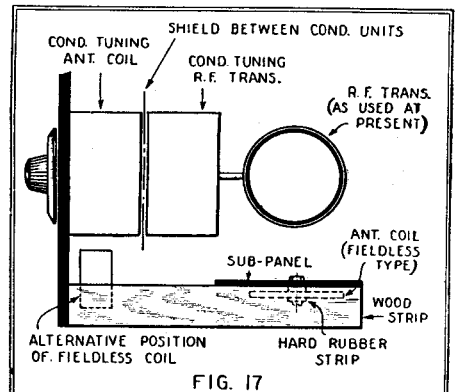


FIG. 17

Arrangement of apparatus for a Browning-Drake receiver employing tandem condensers.

## Home-Made Coils for the Browning-Drake

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fort if the form is screwed to the work table or bench; for this purpose two clearance holes for wood screws are provided at the ends of the wooden base. If the constructor has a large vise, he may clamp the base supporting the form in it while carrying out the winding.

Before starting the winding, two or three strips of surgical plaster, or paper strips coated with common glue, are placed, evenly spaced, over each form, just as in the case of a "pickle-bottle" coil. These strips may be held in position by rubber bands slipped over their ends, or still better by push-pins pressed into the form. The latter method is preferable, since the pins locate the strips definitely, and no slipping is possible.

To hold one end of the wire while the winding proceeds, a short nail or small wood screw is driven into the wooden base. A few turns of wire are taken around this, and when the winding is completed, the other end of the wire is fastened in a similar manner.

The strips of tape are bent over the finished layer of wire, after the drawing pins or rubber bands have been removed. The strips should be long enough to overlap about  $\frac{1}{2}$ -inch. Finally, the plaster strips are pressed down upon the wire, to bind well.

The nuts are now taken off the bolts, and the coil, with the form blocks still in position, can be withdrawn from the base, which is clamped to the work-bench. The forms are freed and taken out by twisting them gently; if the wire has been wound with the right tension, and not too tightly, they will come out quite easily. The center of the coil, where the wires cross over, is bound with a few turns of thin cord, or tape, as before.

The number of turns required for a given variable condenser must be determined by experiment; for a start, thirty to forty turns of No. 26 D.C.C. wire may be tried. Care must be taken when winding these coils to space the wires slightly on their forms, else the coil will bulge out at the center.

This brings us to the final development the writer has in mind; a Browning-Drake equipped with tandem condensers. At the end of the rear condenser a R.F. transformer of the present-day type is carried (Fig. 17). Under the sub-panel, or anywhere else out of the way, lies the fieldless antenna coil.

With one stroke, we have single-control, no more interference between coils, and a far more compact set: in short—the ideal Browning-Drake! It may yet prove the four-tuber of the future!

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