tifiers are comparatively critical, and manufacturer's specifications should be followed closely to avoid overloading or applying excessive input voltage when the unit is operating without a load.

Not too much data is available on the various types of commercial dry rectifiers although they are now in great demand for use in high-current supplies. The unit shown is a Mallory 1S16B7. Equivalents will work equally well. Just be sure that the rectifier selected is capable of delivering the required current. Do not permit the a.c. no-load voltage input to exceed manufacturer's specifications. Maximum no-load voltage for the 1S16B7 is 14.4 a.c. Do not use the 15-volt tap on the transformer unless line voltage is lower than normal.

T1 is a filament transformer with three 2.5-volt center-tapped, 8-ampere windings. T2 is a 7.5-volt, 8-ampere transformer. A heavy-duty 7-point switch is used to control the input voltage. This combination permits use of standard parts, though a specially wound transformer would be more convenient.

The filter choke is made by replacing the winding of a 200-ma choke with 100 turns of No. 14 enamel wire or No. 12 wire if space permits. Reassemble the choke and adjust the air gap for best operation.

Induction heater

Judging from the number of requests received, r.f. heating has become very popular with experimenters. A 1-kw dielectric heater was described in the February, 1948, issue of RADIO-CRAFT.

Fig. 4 is the circuit of a 1-kw induction heater. A unit of this type can be constructed from tubes and parts readily available on the surplus market. If a 304TH is unavailable at surplus prices, you may use a 304TL by changing the fixed portion of the grid leak to 4,000 ohms and adjusting the 1,500-ohm control for best operation.

Power input is adjusted with a Variac or similar control. A time-delay relay in the power line prevents application of plate voltage until rectifier and oscillator tubes have reached operating temperature.

L1 is 30 turns of 3/16-inch copper tubing wound with an inside diameter of 7 5/16 inches and spaced to occupy 12 inches. L2 is a 1-turn winding around L1. It is 13 inches long and has an inside diameter of 8¼ inches. It is formed in a cylindrical shape from 1/32-inch sheet copper. A ½-inch gap lengthwise through the coil prevents shorting. The coils are constructed as shown in Fig. 5. Heavy leads to L3 are connected to both sides of the gap. The size and shape of the work coil L3 depends on the application. Experiment with the size of tubing and number of turns to obtain best results.

Crystal-Controlled Diathermy

The FCC ruled recently that users of diathermy and r.f. heating equipment must either reduce radiation from their apparatus to a negligible degree by shielding or *operate within narrow specified bands.* In most cases, adequate shielding is impractical—making operation on the *diathermy bands* the only alternative.

The crystal-controlled diathermy circuit shown in Fig. 5 operates on 27.32 mc. It was designed and constructed by members of the Application Engineering Department of Eitel-McCullough, Inc., and described in the October, 1946, issue of *Electronics.*

The circuit uses a 6AG7 oscillator doubling in its plate circuit from a 6.83-mc crystal, followed by a 6L6 doubler driving the 4-250A final amplifier on 27.32-mc. Coils are wound as follows:

L1—12 turns No. 16 on 1-inch form, spaced to 1½ inches.

L2—10 turns No. 16 on 1-inch form, spaced to 1¼ inches.

L3—5 turns ¼-inch tubing on 2½-inch form, spaced to 4 inches.

L4—1 turn No. 8 around ground end of L3.

L5 and L6—6 turns No. 8 on 1-inch form, spaced to 2 inches.

L7 and L8—4 turns No. 8 on 1-inch form, spaced to 1½ inches.

L9—1 turn No. 8 mounted between output jacks.

Applicator pads for diathermy machines can be obtained from most electro-medical supply dealers.

Editor's note

(We have enough material on hand to run another article of this type covering receivers, transmitters and oscilloscopes if readers desire it.

There seems to be considerable interest in electronic controls such as photoelectric and capacity relays and timing, pulsing and counting circuits. Two or more of these circuits can be combined to produce some novel and interesting results. We may have just the circuit you are looking for. Let's hear from you.)

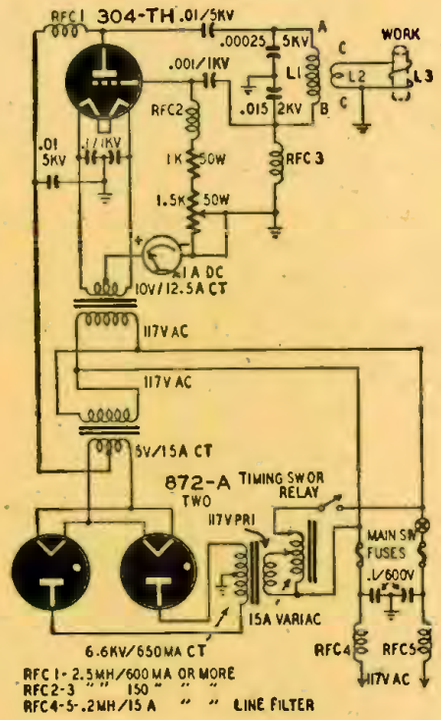

Fig. 4—A 1-kw r.f. induction heater.

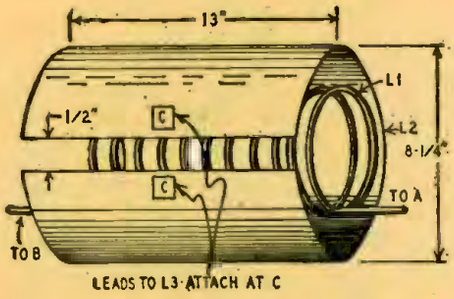

Fig. 5—The output coil is sheet copper.

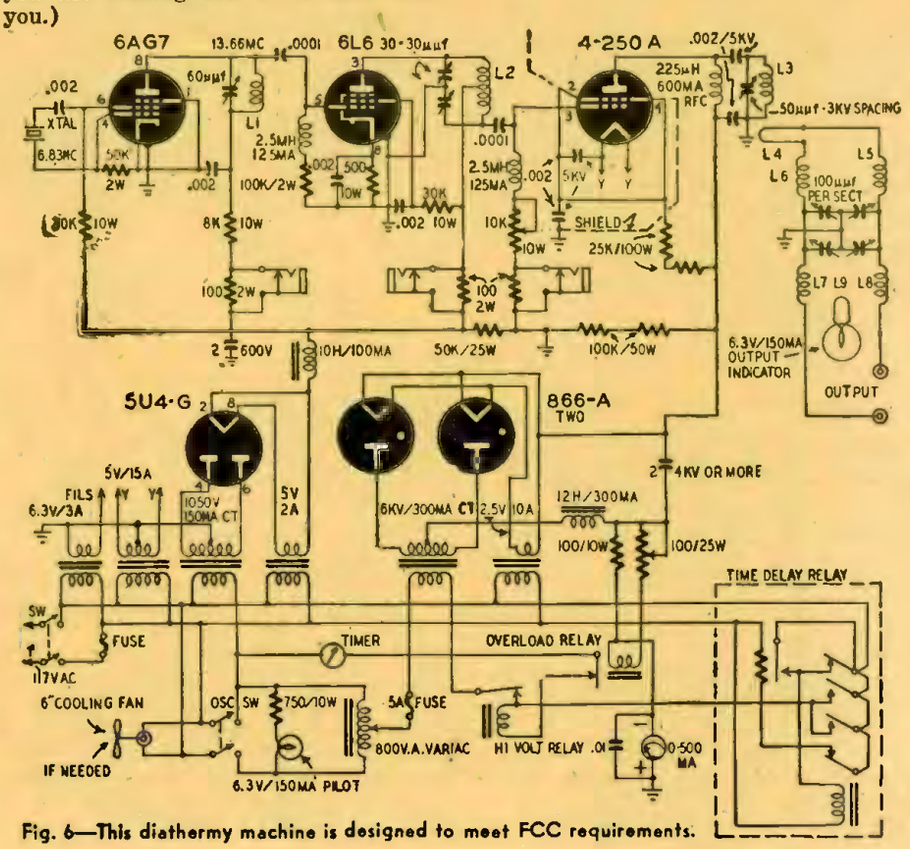

Fig. 6—This diathermy machine is designed to meet FCC requirements.