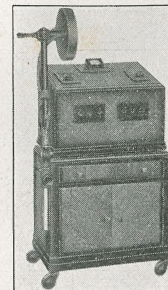


COUNCIL ON PHYSICAL THERAPY

LIEBEL-FLARSHEIM IMPROVED SW2-C STANDARD MODEL SHORT WAVE GENERATOR ACCEPTABLE

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati.

This unit is similar to the Liebel-Flarsheim SW2-C Model Short Wave Generator previously accepted by the Council (*THE JOURNAL*, Nov. 23, 1935, p. 1682) except that it has been improved to allow for an increase in power output. It is recommended for medical and minor surgical purposes. Applications may be made by inductance cable, treatment drum, cuffs, pads and orificial electrodes, and the unit may be employed to induce fever for hyperpyrexia treatments.



Liebel-Flarsheim Improved SW2-C Standard Model Short Wave Generator.

The unit is supplied in a portable wooden cabinet with separate subcabinet and in this form the net weight is about 76 pounds and the shipping weight is about 110 pounds. It is also supplied optionally in a one-piece all metal cabinet and in this form the net weight is 163 pounds and the shipping weight is 265 pounds.

Two oscillator tubes are utilized in a tuned plate, tuned grid, circuit generating a wavelength of about 22.6 meters. The patient, cable and drum circuits are inductively coupled to the oscillator. A filter is employed in the supply line for the purpose of minimizing line feed-back for possible radio interference. The circuit also incorporates a device which protects the oscillator tubes from overload and gives an audible signal when the unit needs readjustment. An electric fan provides forced-draft ventilation.

The firm submitted engineering data to support its claim for the power output of the machine. This is as follows:

Calorimetric Method.—The temperature rise induced in a given amount of water in a given time indicates an average output of 465 watts on the pad circuit and 470 watts on the cable circuit, with an input of 1,160 watts and 1,175 watts respectively.

Photoelectric Cell Method.—Two 300 watt bulbs were arranged in parallel. Measurement of light indicated an average on the cable circuit of 540 watts output with 1,185 watts input, and on the pad circuit 495 watts output with 1,180 watts input.

Tests were carried out for the Council to substantiate these claims. Three separate calorimetric tests were carried out with the apparatus, and the results showed that the claimed output of 470 watts at an input of 1,160 watts could be obtained readily.

The unit was operated at full load for two hours. The transformer temperature rise was found to be low enough to meet the requirements of the Council.

To provide evidence as to the functioning of the machine in heating the human body, the firm submitted a series of tests performed in a reliable clinic.

Average Temperatures of Six Observations

	Deep Muscle, Degrees F.		Oral, Degrees F.	
	Initial	Final	Initial	Final
Coil technic	98.6	106.3	98.6	98.9
Treatment drum technic	98.4	105.8	98.5	98.8
Cuff technic	98.0	105.3	98.4	98.8

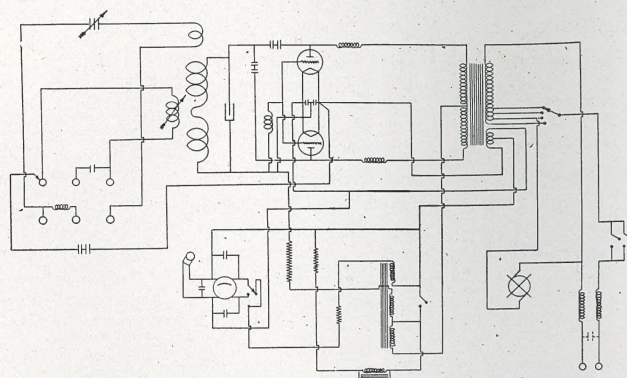


Diagram of circuit.

Treatments were given for twenty minutes each in accordance with the patient's tolerance. For the coil technic, four turns of the cable were wrapped around the thigh with approximately 1 inch spacing of turkish toweling. Two turns were taken high up on the thigh, then about 4 inches of spacing was allowed for inserting the thermocouples, and two more turns were taken below the incision. When the treatment drum was used it was applied over the thigh, as close to the skin and as nearly over the point where the temperatures were read as the thermocouples would permit. For the cuff technic, two cuff electrodes with approximately one half inch of felt spacer under

each were wrapped around the thigh with about 4 inches spacing between the proximal edges.

A Chapman orificial electrode also was used. This electrode was drilled out so that a thermometer could be passed through and be in actual contact with the cervical tissue, giving temperature readings from the cervix and not the interior portion of the electrode. A large short wave pad was used as the dispersive electrode and was spaced 2 to 3 inches from the lower part of the abdomen by means of a folded turkish towel.

Average of Six Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
101.5 normal	110.2

The thermometer was left in position throughout the treatment. The duration of each treatment was thirty minutes.

Nine other tests were made at another hospital, giving the results shown in the table.

Average of Nine Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
98.6	109.6

In addition, eight fever treatment charts were submitted as evidence of the efficacy of the unit in supplying heat for hyperpyrexia. The Liebel-Flarsheim Fever Cabinet was used.

Average of Eight Observations

Initial, Degrees F.	Time Required to Reach 106 F.
97.9	1 hour 41 minutes

The unit was tried in a clinic acceptable to the Council. It was found to give satisfactory service and to perform in accordance to the claims submitted by the manufacturer.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Liebel-Flarsheim SW2-C Improved Standard Model Short Wave Generator for inclusion in its list of accepted devices.