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WAR DEPARTMENT TECHNICAL MANUAL

U.S. Dept of Army

TECHNIQUE OF MEDICAL DIATHERMY

UNIVERSITY OF CALIFORNIA
JAN 26 1945
DOCUMENTS DIVISION

WAR DEPARTMENT • 15 NOVEMBER 1944

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For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

United States Government Printing Office

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WAR DEPARTMENT,
WASHINGTON 25, D. C., 15 NOVEMBER 1944.

TM 8–350, Technique of Medical Diathermy, is published for the information and guidance of all concerned.

[A.G. 300.7 (12 Jul 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
J. A. ULIO,
Major General,
The Adjutant General.

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For explanation of symbols, see FM 21–6.

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SECTION I

GENERAL

1. PURPOSE AND SCOPE. The purpose of this manual is to provide a handy text illustrating the more frequent uses of medical diathermy as applied by coil and disc technique. Pathological indications relating to medical diathermy are not presented in this manual. For such information the reader is referred to standard texts on physical therapy.

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SECTION II

PRINCIPLES IN THE USE OF HEAT

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2. GENERAL. Heat, administered by various methods, is accepted as a valuable therapeutic agent in many conditions. Medical diathermy applies heat usually by means of the coil or disc technique. Generally mild heat, or heat of moderate intensity over a longer period is as effective and is better tolerated than intense heat for shorter periods.

3. PHYSIOLOGIC EFFECTS. a. Heat will accomplish two physiological effects:

(1) An increase in blood supply to the part.

(2) Relaxation of muscle spasm, which will frequently relieve pain.

b. Caution. Heat should never be used where an increase in blood would be detrimental as in acute trauma during the first 48 hours when there may be a chance of further local hemorrhage, or where there is bleeding into the tissues. Diathermy can generally be safely started after 48 hours in traumatic cases, thus hastening resolution of hemorrhage and giving an earlier and more complete recovery with less fibrous organization of the exudate. It should not be used in any case where there is organic or functional inability on the part of the circulation to increase in response to heat. Great caution should also be exercised in treating anesthetic regions, or injuries which may be complicated by vascular or neurovascular changes. The occurrence of increased pain, or the appearance of pain in non-painful areas is to be regarded as an absolute indication for the immediate reduction in intensity of the application. If pain persists after the reduction of intensity it is well to consider the discontinuance of treatment with diathermy.

4. SPHERE OF APPLICATION. Medical diathermy may be used with benefit wherever there is deep seated inflammation or tissue repair in progress so long as caution, particularly those noted in paragraph 3b, is exercised. It is well to bear in mind that inflamed tissues, due to the presence of edema, are more readily overheated than normal tissues. It is essential, therefore, that only moderate heat be induced in inflamed tissues. A practical way of accomplishing this is to start the treatment with an intensity sufficiently great that the patient states that he feels considerable heat, then IMMEDIATELY turn down the intensity to two-thirds or even to one-half the original setting.

5. FREQUENCY AND LENGTH OF TREATMENT. The frequency and the length of the treatments must be determined in each case with due regard to the pathologic process involved. It may be stated in general that where there is acute inflammation the treatments should be mild and frequently repeated, whereas, in the treatment of simple muscle sprains they may be of greater intensity and at less frequent intervals.

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SECTION III

DIATHERMY SERVICE

6. GENERAL. a. Modern diathermy machines have treatment cables (coil) and treatment drums (disc) which make use of the principle of inducing heat in tissue due to the presence of an electromagnetic field. It may be stated that in the average machine a current of about 7000 to 8000 volts changing direction of flow at the rate of 12 to 24 million times a second is generated. It is this current running through the treatment coil or disc which sets up the electromagnetic field (figs. 1, 2, 3, 4, and 5).

b. Electromagnetic field. Eddy currents, set up in the tissue by the presence of the electromagnetic field, heat the tissues in direct proportions to the conductivity of the tissues, providing there is adequate spacing of the coil or disc from the skin.

7. FUNDAMENTALS OF DIATHERMY APPLICATION. a. General. It is not the purpose of this manual to set forth the specific technique of setting the intensity controls for any given piece of apparatus. Specific instructions on the operation of the machine are furnished by the manufacturer. However, when moderate heat is called for, this is approximately one-half the maximum intensity. Mild heat is approximately one-third the maximum intensity setting.

b. Metallic objects will heat up quickly in the electromagnetic field, therefore, metal bracelets or wrist watches should be removed. Fillings in the teeth and other buried metals may not cause difficulties, if low intensity treatments or "indirect exposures" are administered in such cases. However, in the presence of metal bone-plates, this practice is not approved because of possible tissue damage which may result.

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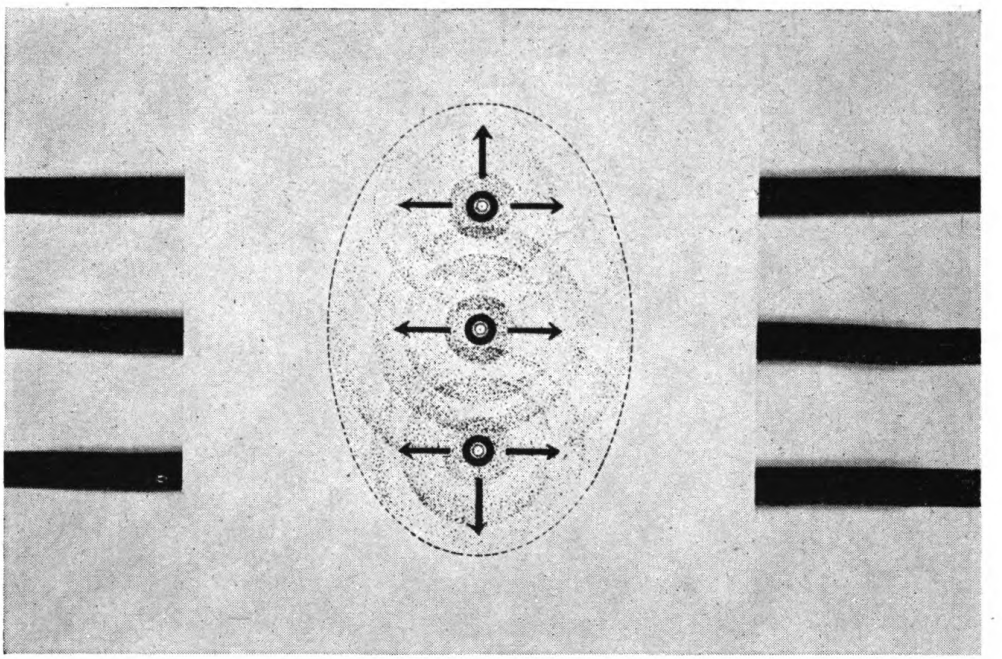


FIGURE 3. SCHEMATIC REPRESENTATION OF ELECTRO-MAGNETIC FIELD IN VICINITY OF COIL (3 turns).
(Heavy black circles represent coil).

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FIGURE 4. TREATMENT DISC (DRUM).

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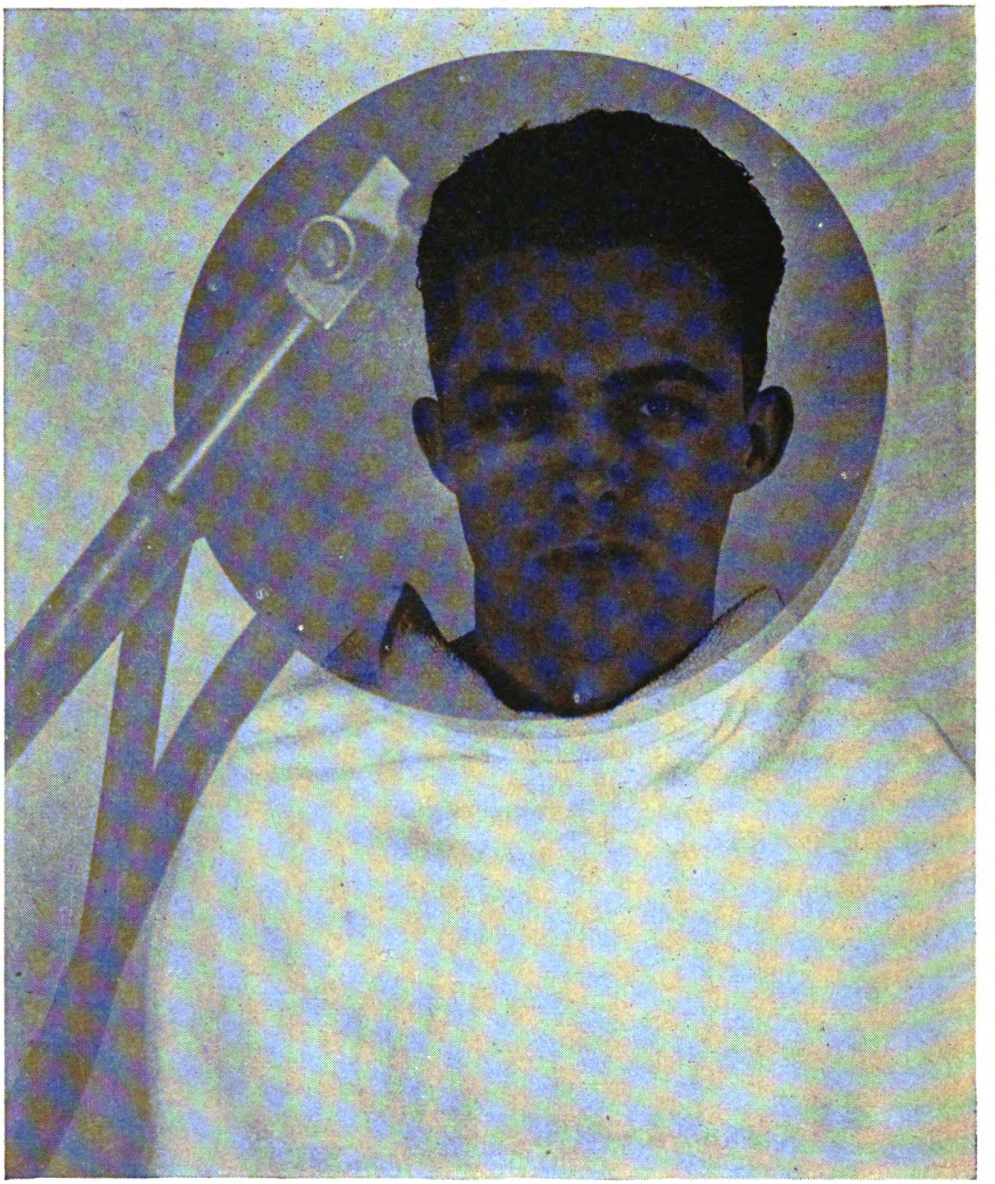
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SECTION IV

PRACTICAL APPLICATION

HEAD AND PARANASAL SINUSES



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FIGURE 6. RELATION OF DISC TO PART.

Caution. Remove metallic objects (hair-pins, metal clasps, glasses and metal neck chains). Insure adequate nasal drainage.

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FIGURE 6. RELATION OF DISC TO PART—LATERAL VIEW—continued.

Insulation: None.
Intensity: Mild.
Danger: Dizziness or headache, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Sitting when possible.

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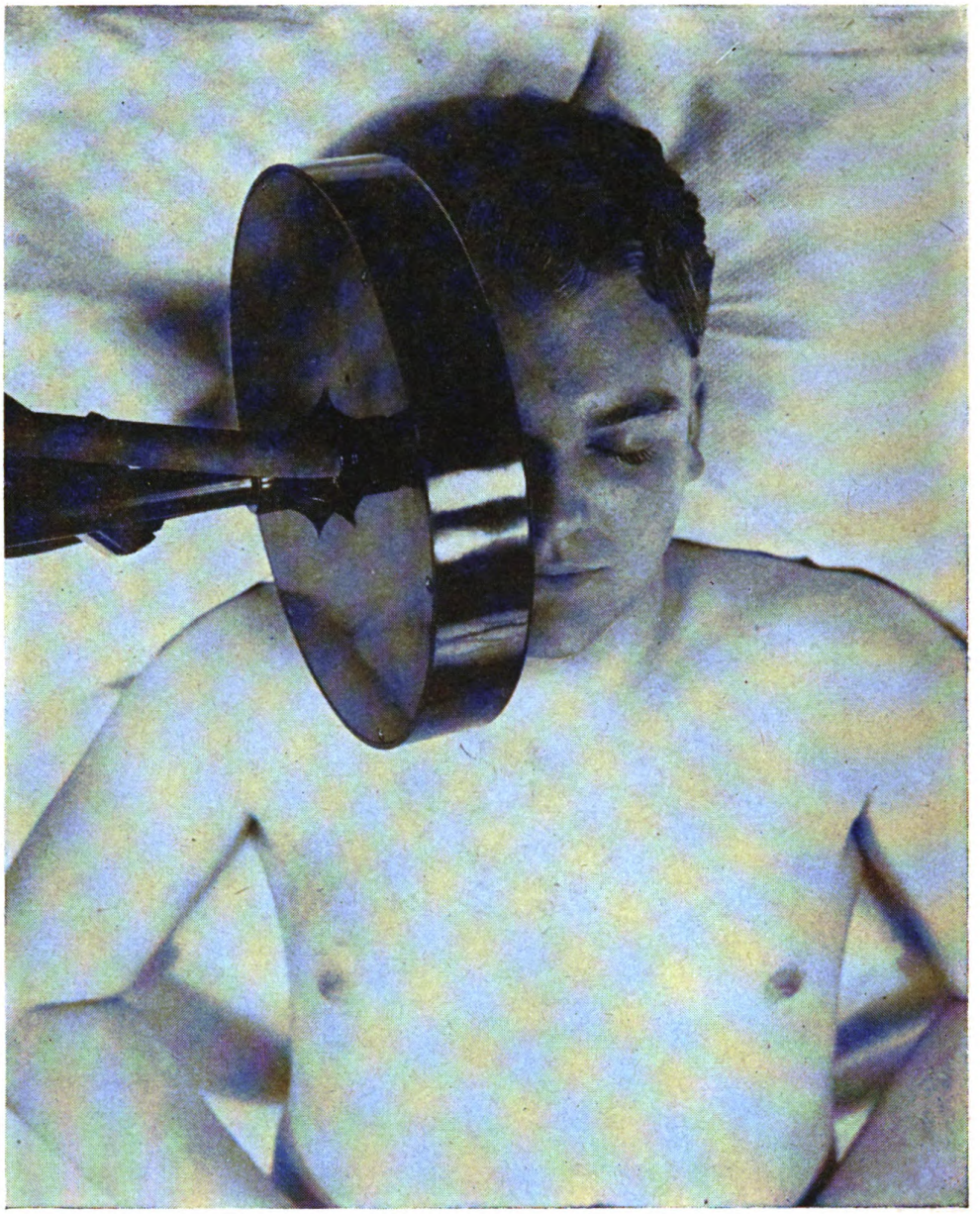


FIGURE 8. RELATION OF DISC TO PART.

Caution. Remove metallic objects (hair-pins, metal clasps, glasses and metal neck chains). Insure adequate nasal drainage.

Insulation: None.
Intensity: None.
Danger: Dizziness or pain, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Sitting if possible.

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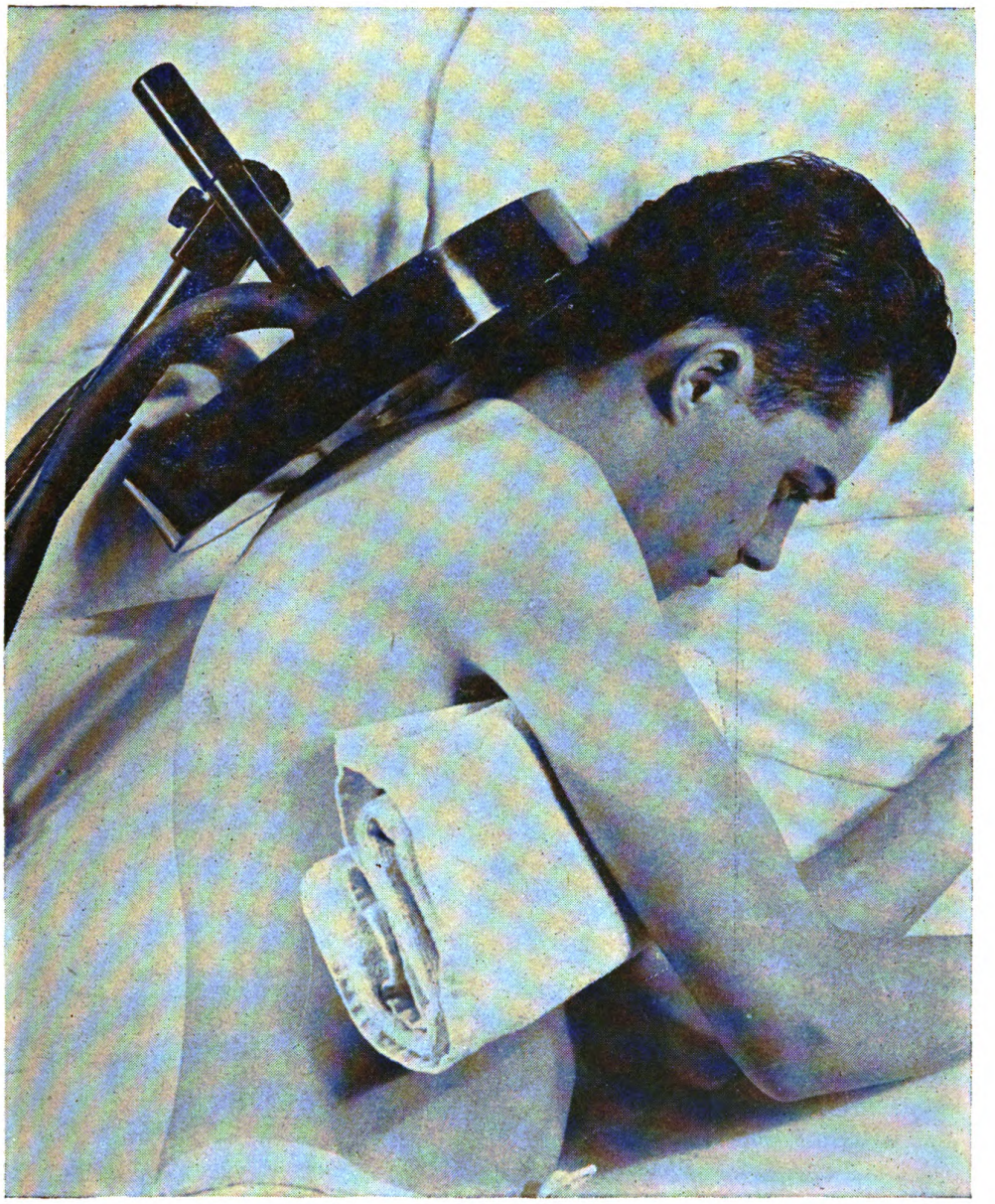
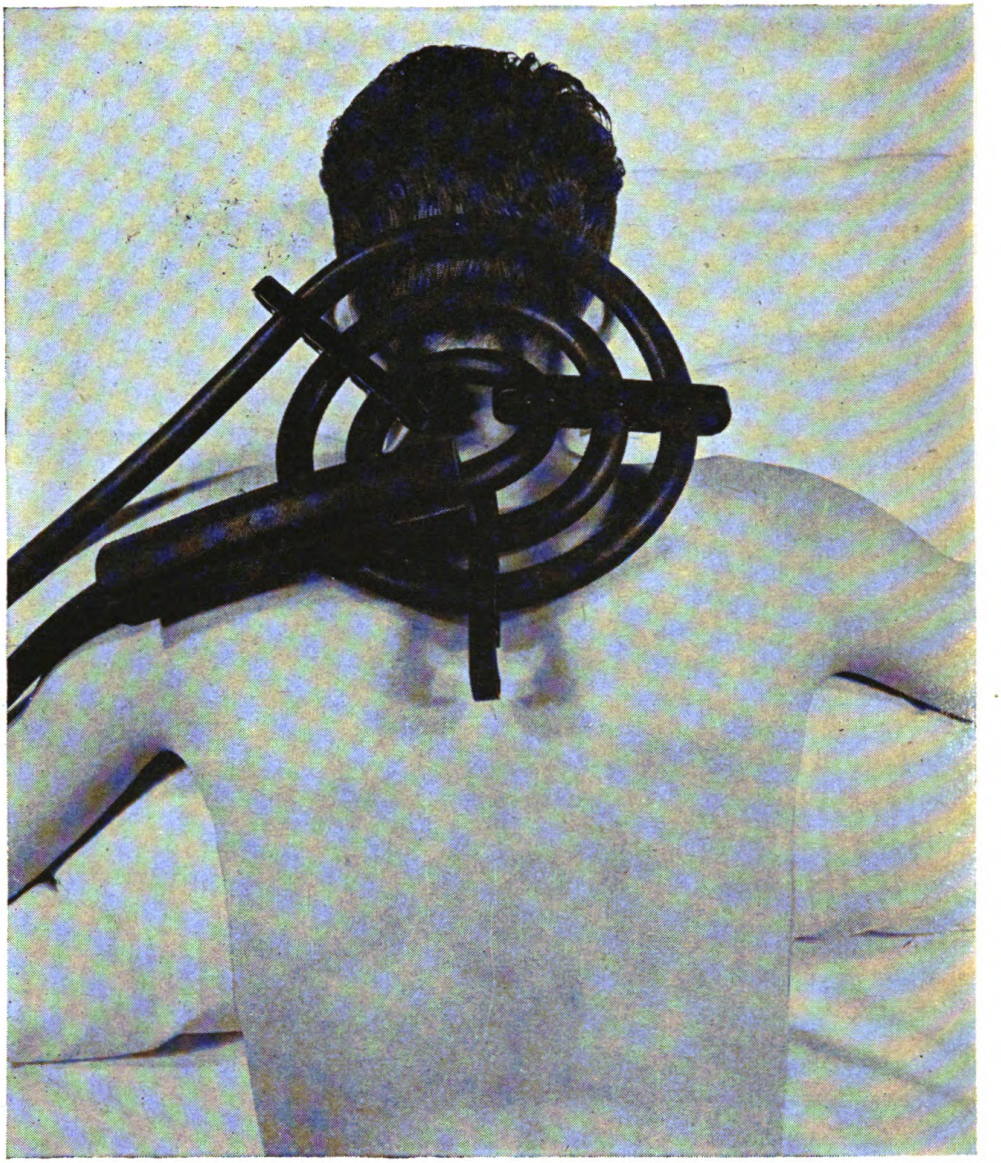


FIGURE 9. RELATION OF DISC TO PART.

Caution. Remove metallic objects (hair-pins, metal clasps, glasses, metal neck chains).

Insulation: None.
Intensity: Moderate to mild.
Danger: Dizziness or pain, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Sitting if possible.

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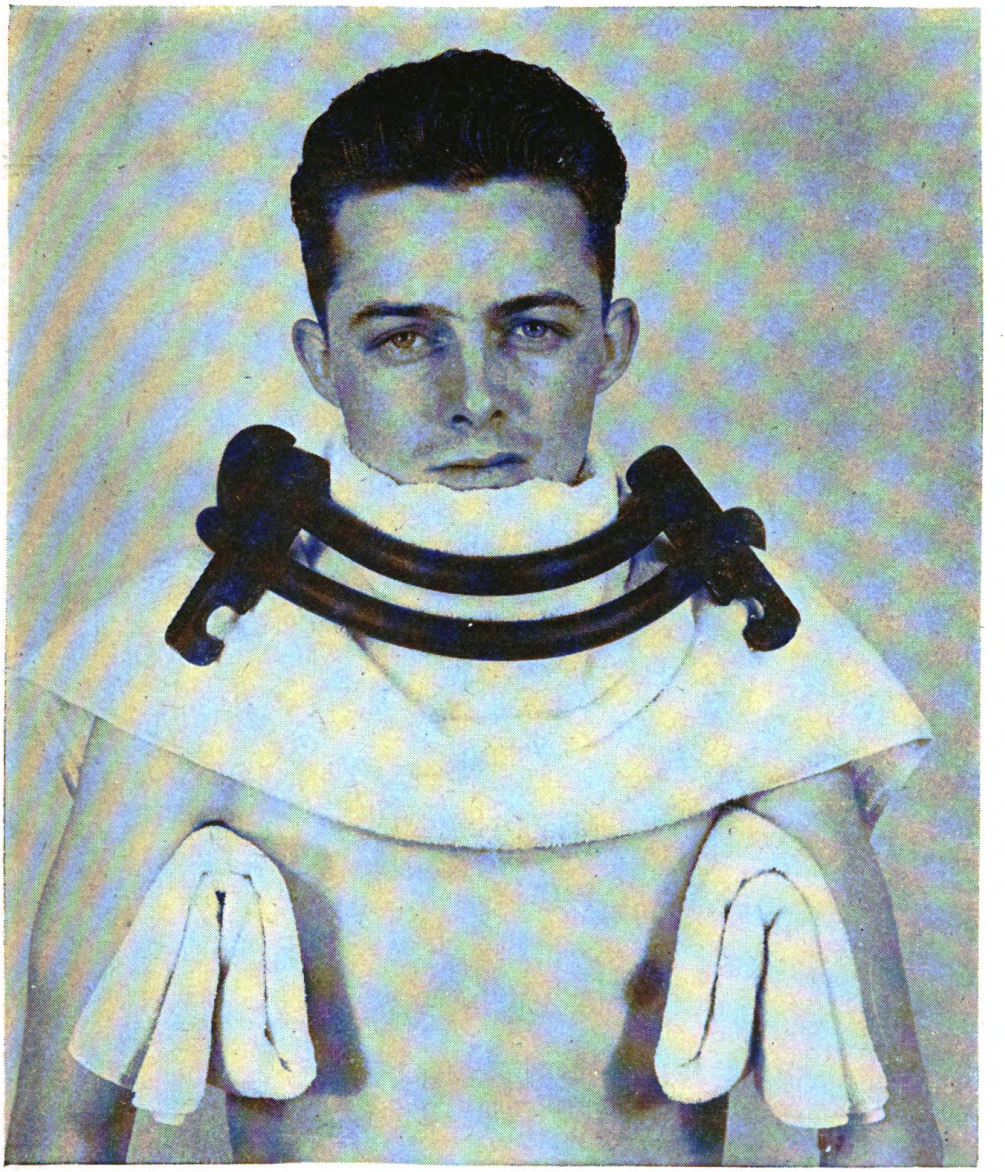
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FIGURE 10. RELATION OF COIL TO PART.

Caution. Remove metallic objects (hair-pins, metal clasps, glasses, metal neck chains). Folded heavy towels in each axilla, or arms well separated from body.

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FIGURE 11. RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of dry heavy toweling.
Intensity: Moderate to mild.
Danger: Dizziness or pain, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Sitting if possible, or supine.

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FIGURE 12. RELATION OF COIL TO PART.

Caution. Remove metal neck chains. Folded heavy towels in each axilla, or arms well separated from body.

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FIGURE 12. RELATION OF COIL TO PART—continued.
Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate to mild.
Danger: Pain or deep muscle aching, reduce intensity, or stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Supine.

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FIGURE 13. RELATION OF DISC TO PART.

Caution. Remove metal neck chain. Folded heavy towel in each axilla, or arms well separated from body.

Insulation: None.
Intensity: Moderate to mild.
Danger: Pain or deep muscle aching, reduce intensity, or stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Supine, or sitting.

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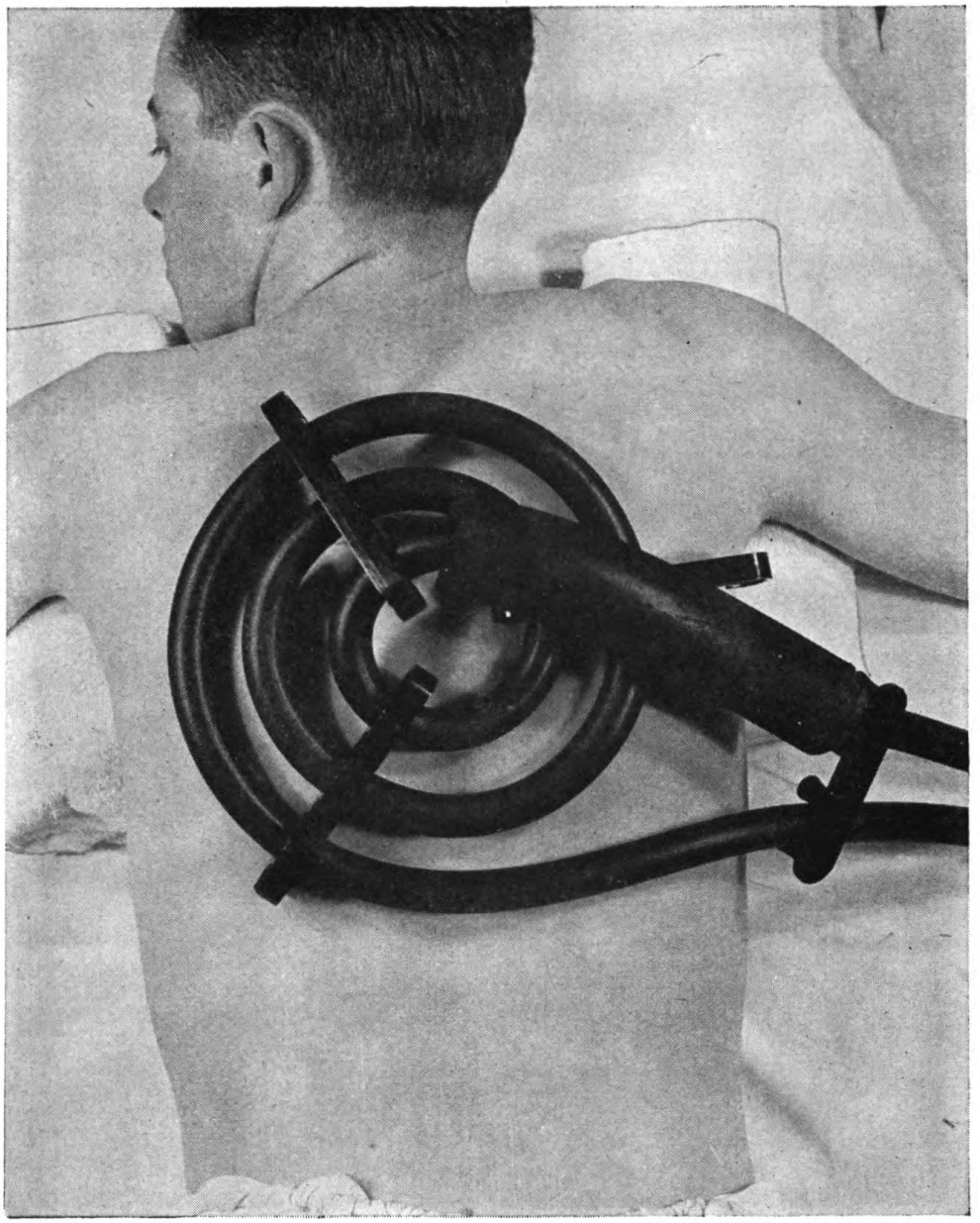


FIGURE 14. RELATION OF DISC TO PART.

Caution. Remove metal neck chain. Folded heavy towel in each axilla, or arms well separated from body.

Insulation: None.
Intensity: Moderate.
Danger: Palpitation or dyspnea, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Supine.

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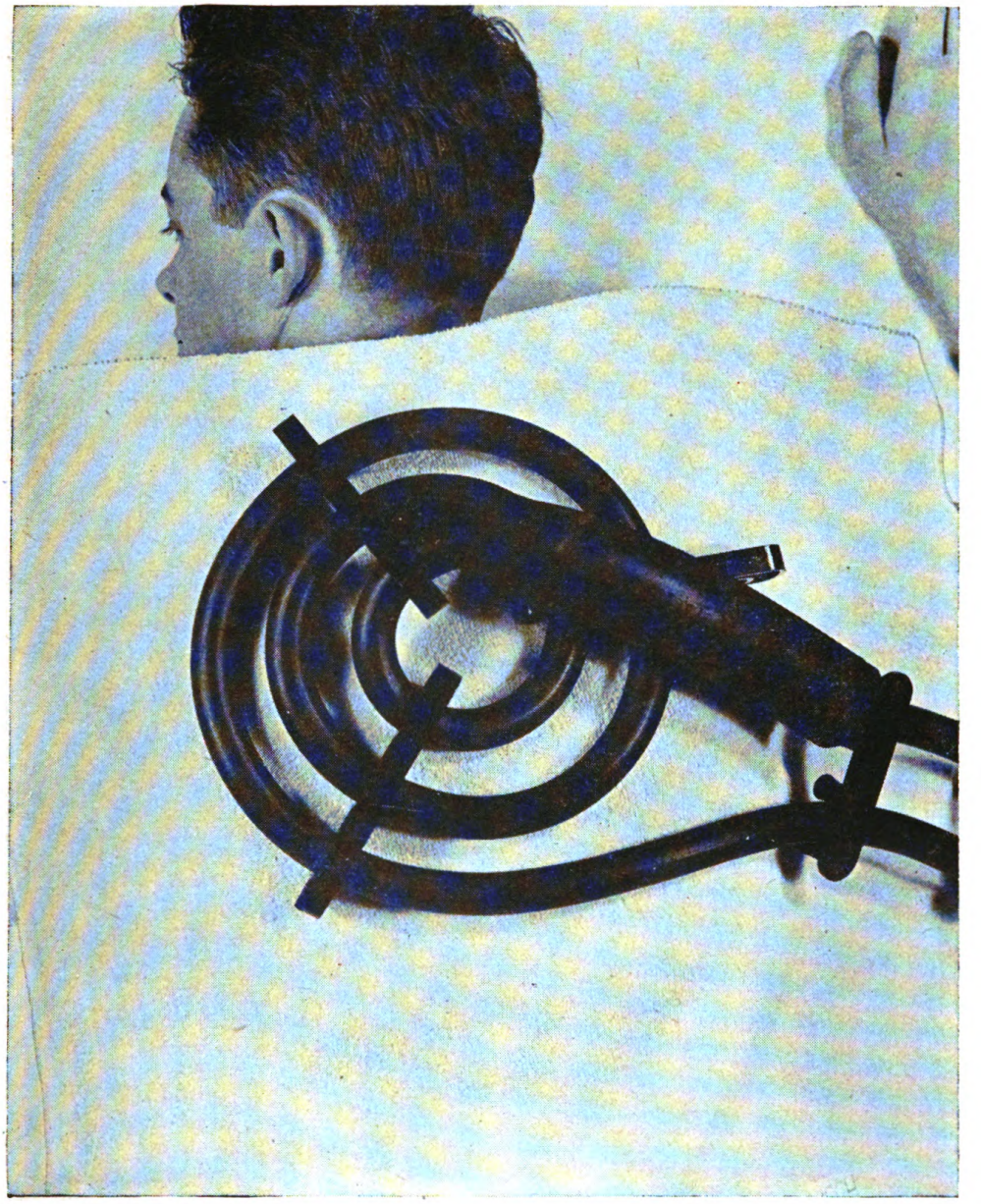


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FIGURE 18. RELATION OF COIL TO PART.

Caution. Remove metal neck chain. Folded heavy towel in each axilla, or arms well separated from body.

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FIGURE 18. RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: Palpitation or dyspnea, stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Prone.

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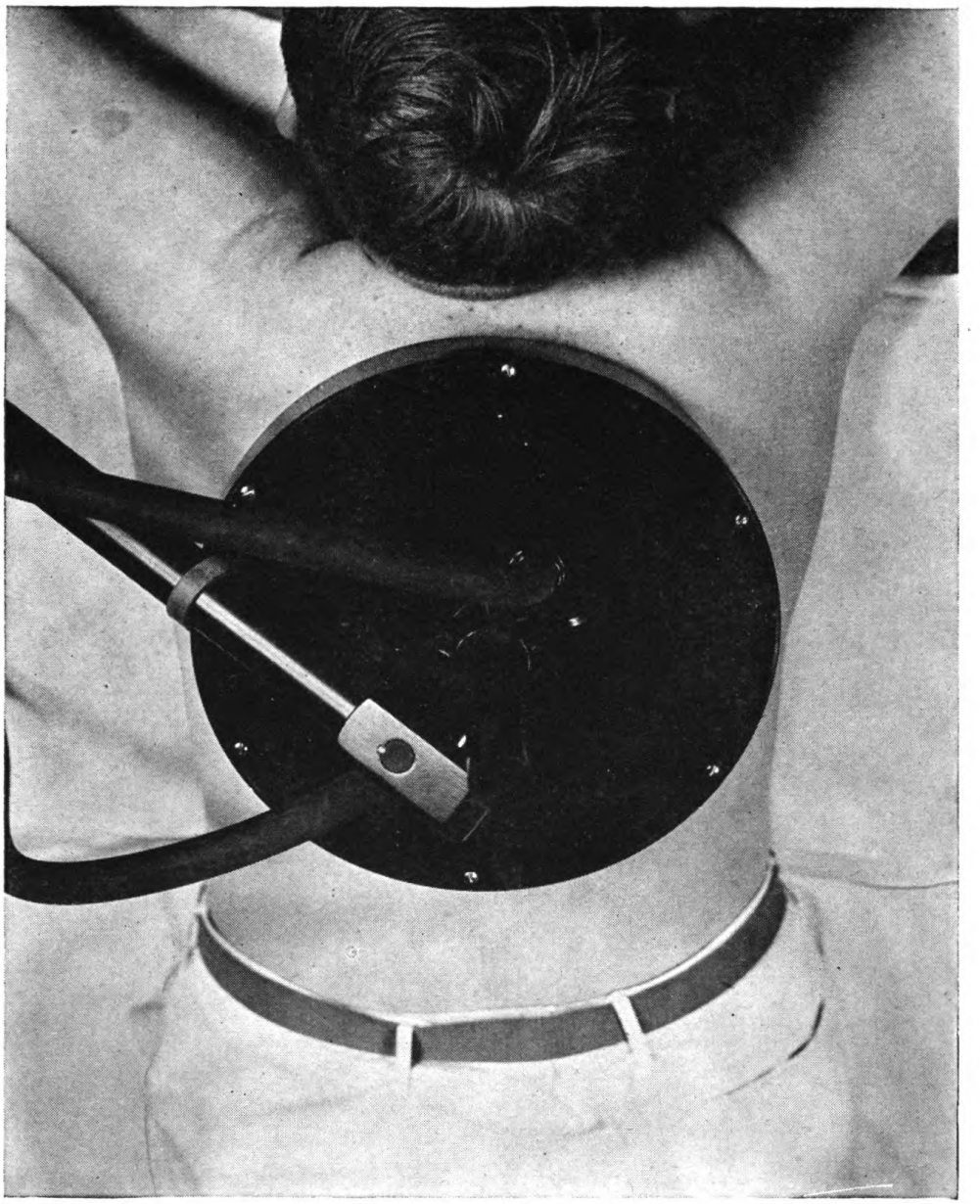


FIGURE 19. RELATION OF DISC TO PART.

Caution. Remove metal neck chain. Folded heavy towel in each axilla, or arms well separated from body. A pillow under chest may add to the comfort of patient.

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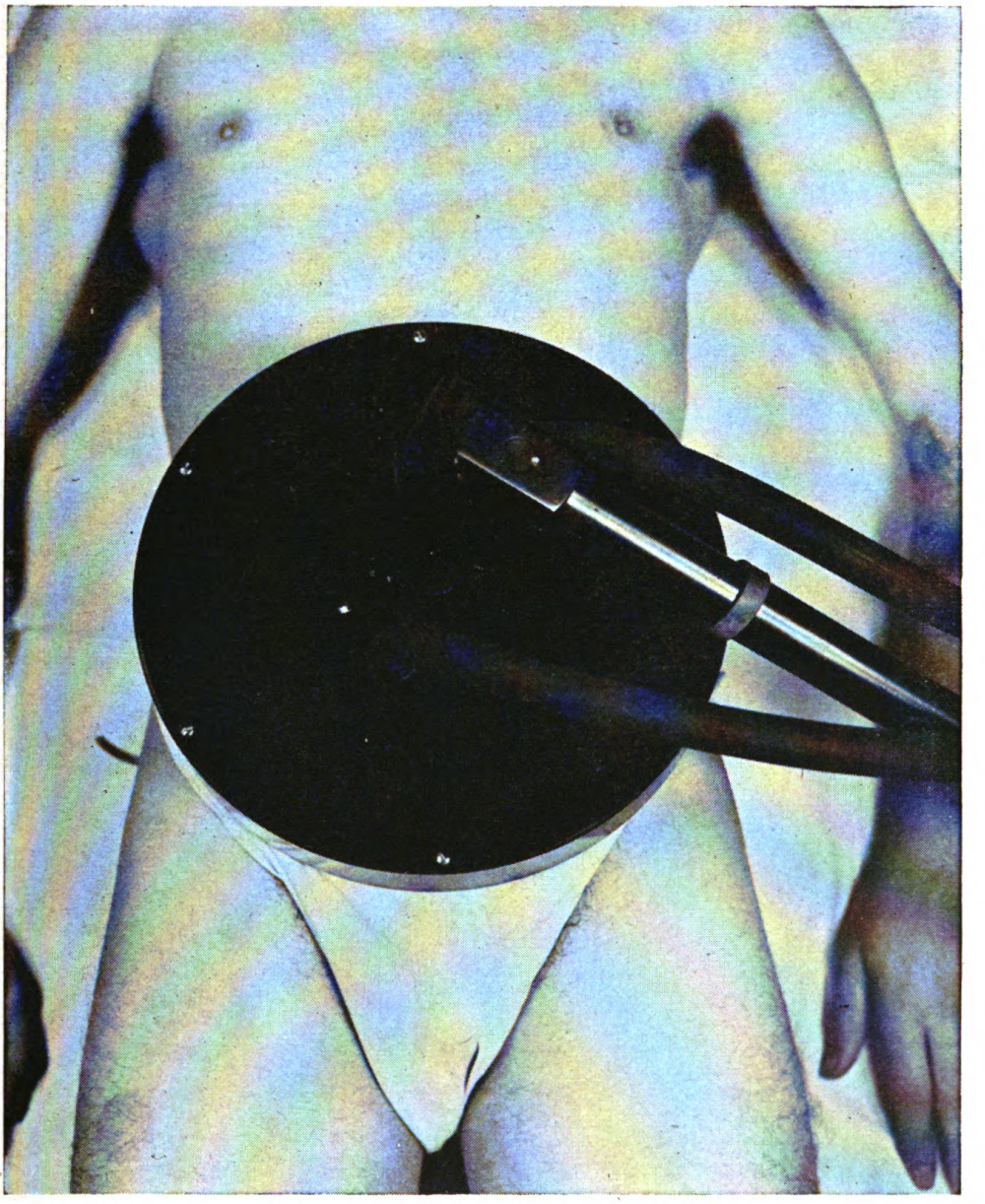
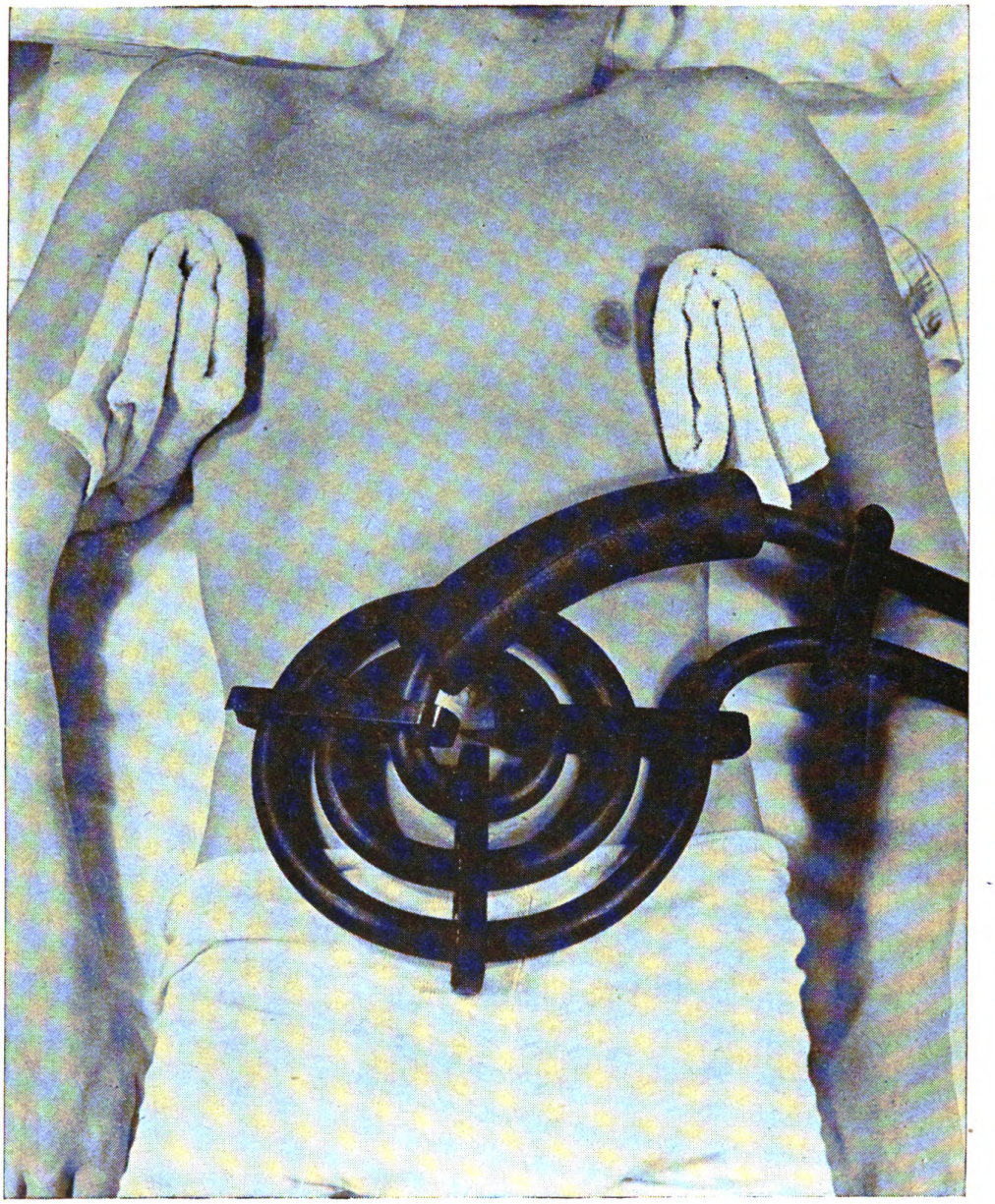


FIGURE 20. RELATION OF DISC TO PART.

Caution. Folded heavy towel in each axilla, or arms well separated from body. Folded heavy towel in crotch or legs well separated. Folded towel over arm where cable crosses it.

Insulation: None.
Intensity: Moderate.
Danger: Pain or cramps, reduce intensity or stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Supine.

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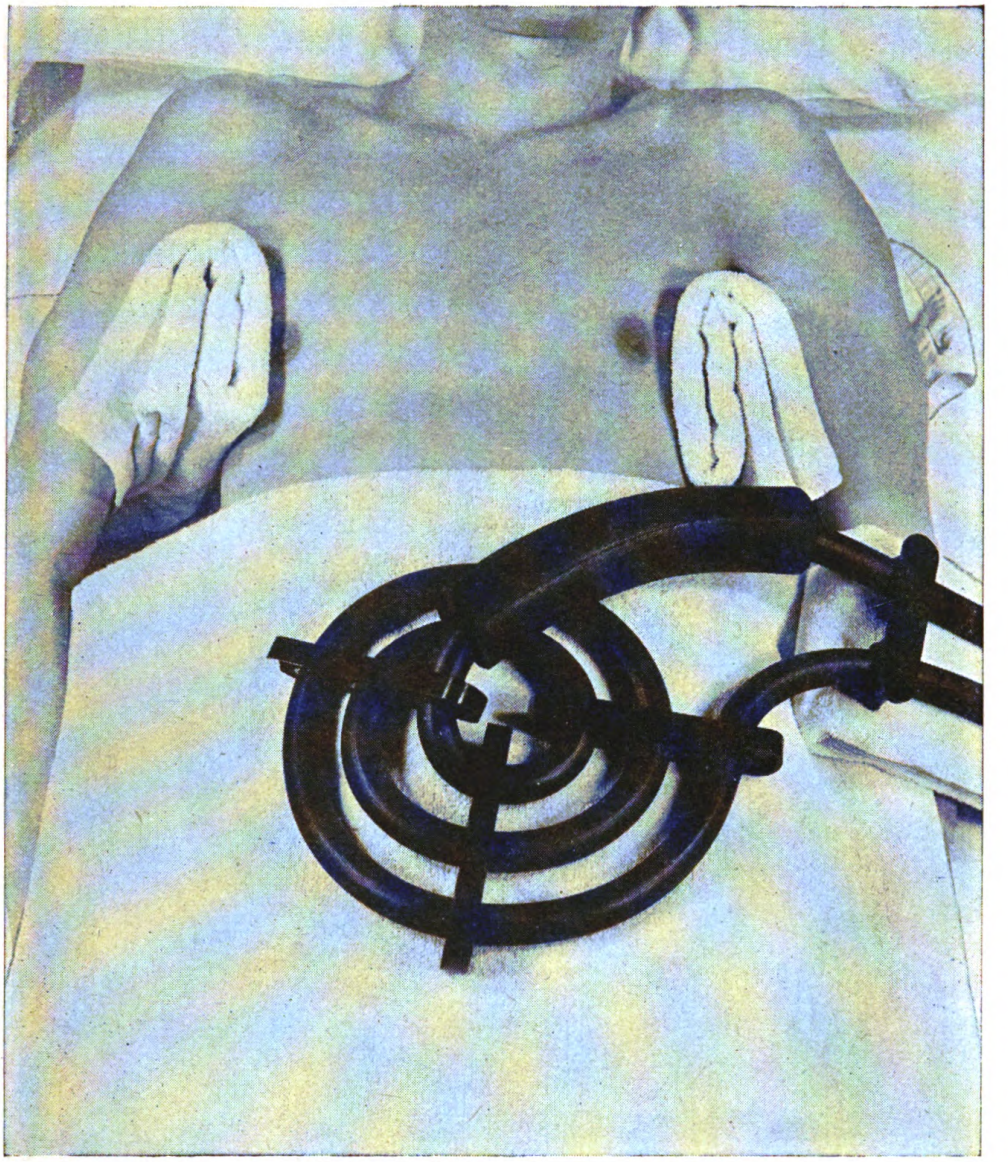
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FIGURE 21. RELATION OF COIL TO PART.

Caution. Remove metal belt buckle. Folded heavy towel in each axilla, or arms well separated from body. Folded towel over arm where coil crosses it.

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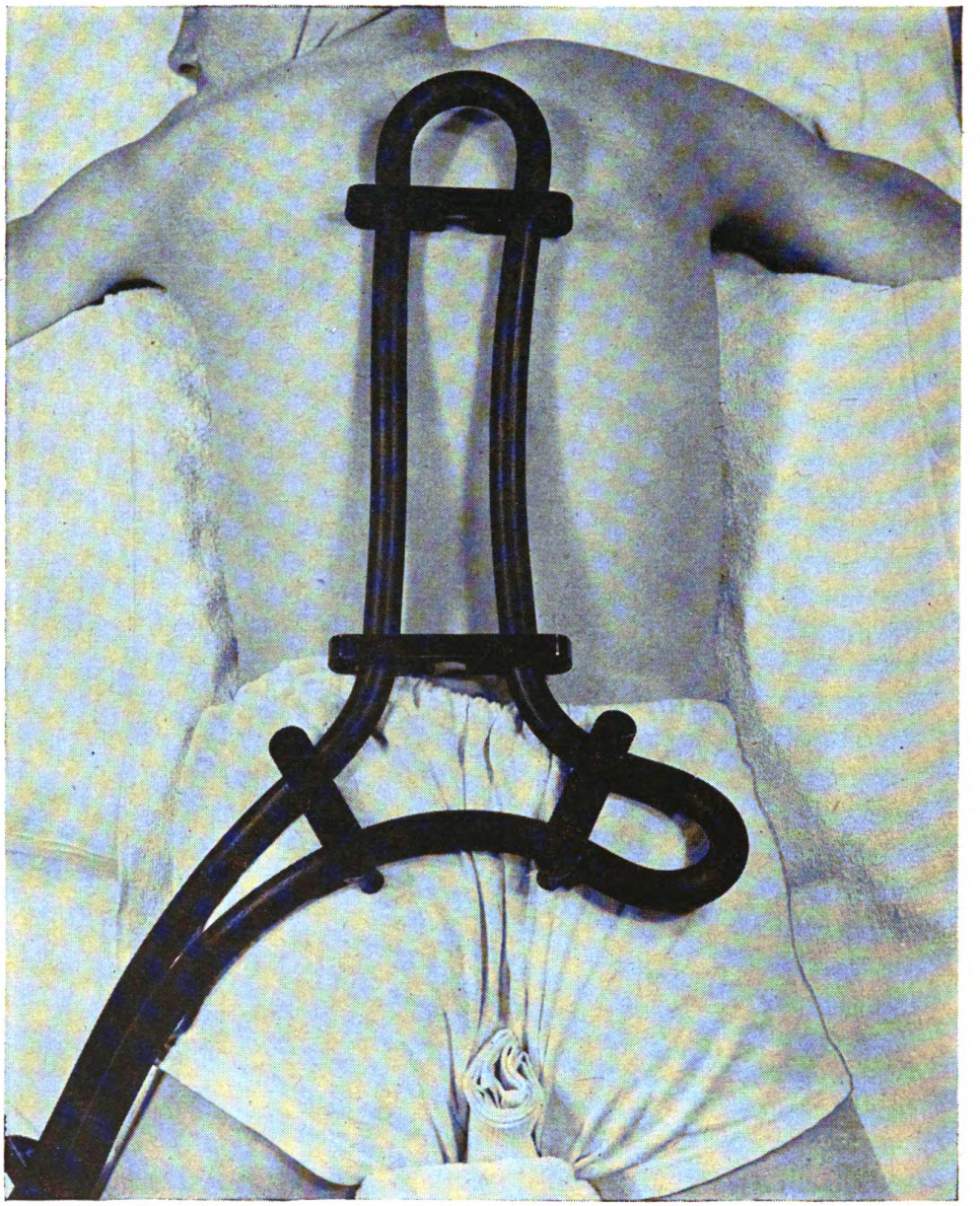


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FIGURE 21. RELATION OF COIL TO PART—continued

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: Pain or cramps, reduce intensity or stop treatment.
Duration: 30 to 60 minutes.
Patient's position: Supine.

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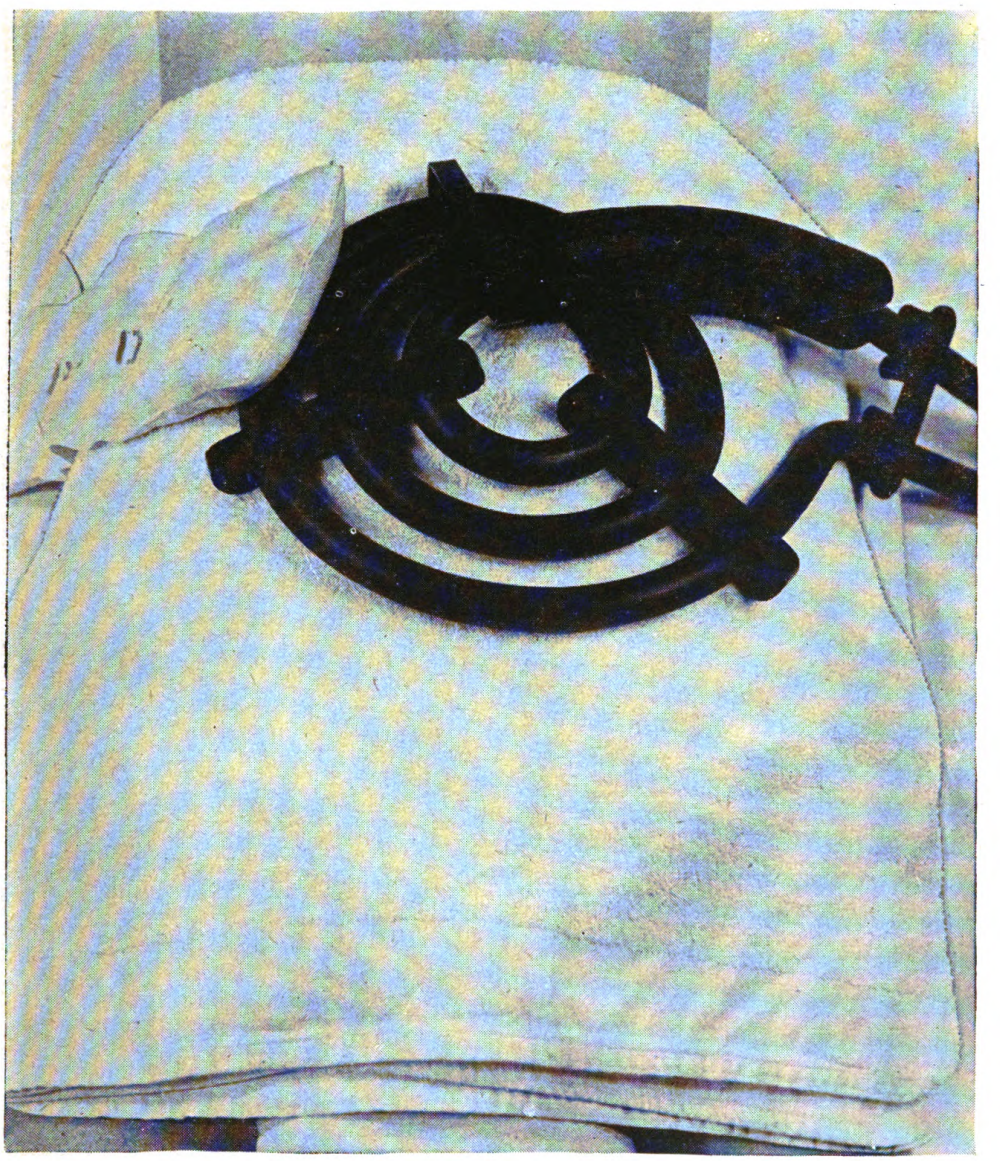
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FIGURE 22. RELATION OF COIL TO PART.

Caution. Remove metal buckle. Folded heavy towel in each axilla, or arms well separated from body. Folded heavy towel between legs. Pillow beneath chest and pelvis.

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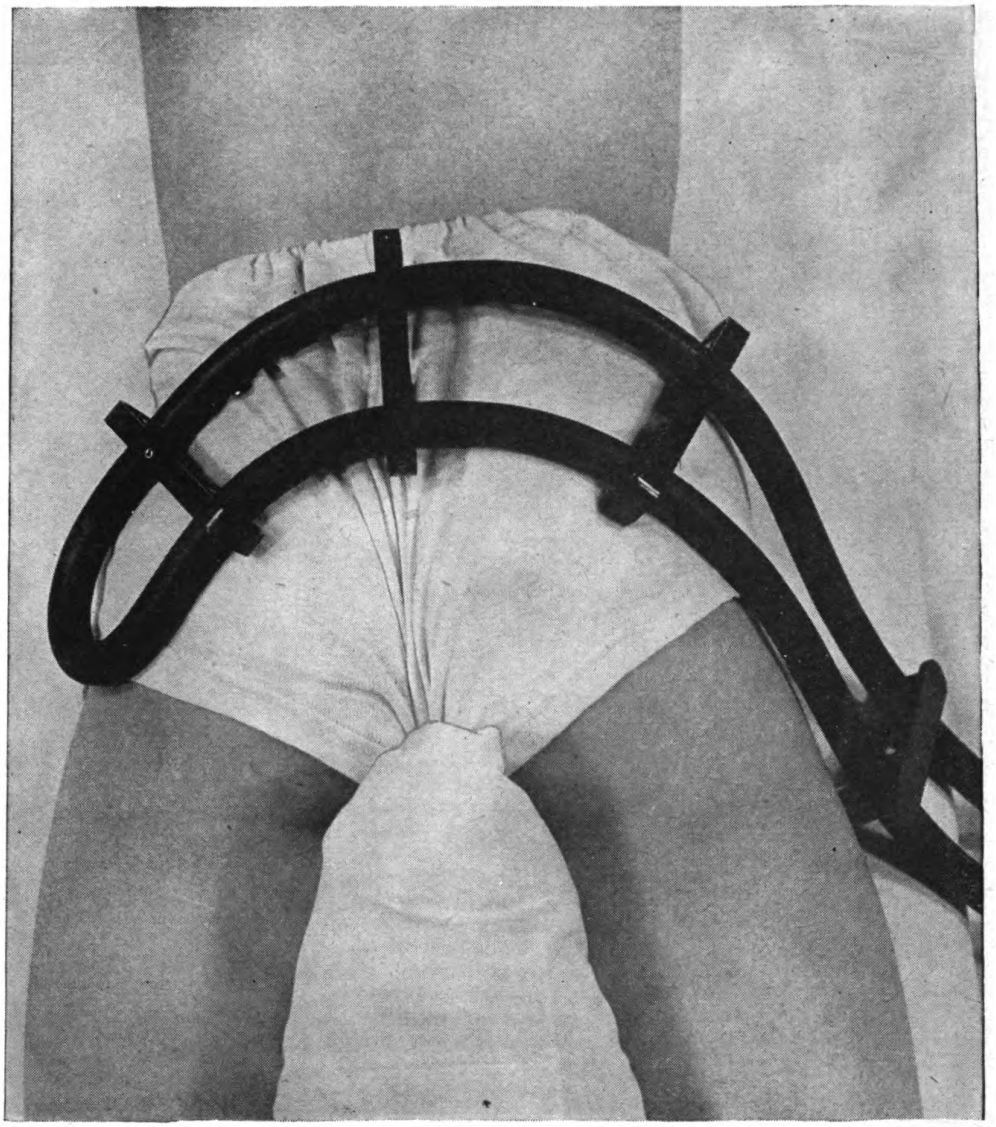


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FIGURE 23. RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: None.
Duration: 30 to 60 minutes.
Patient's position: Prone.

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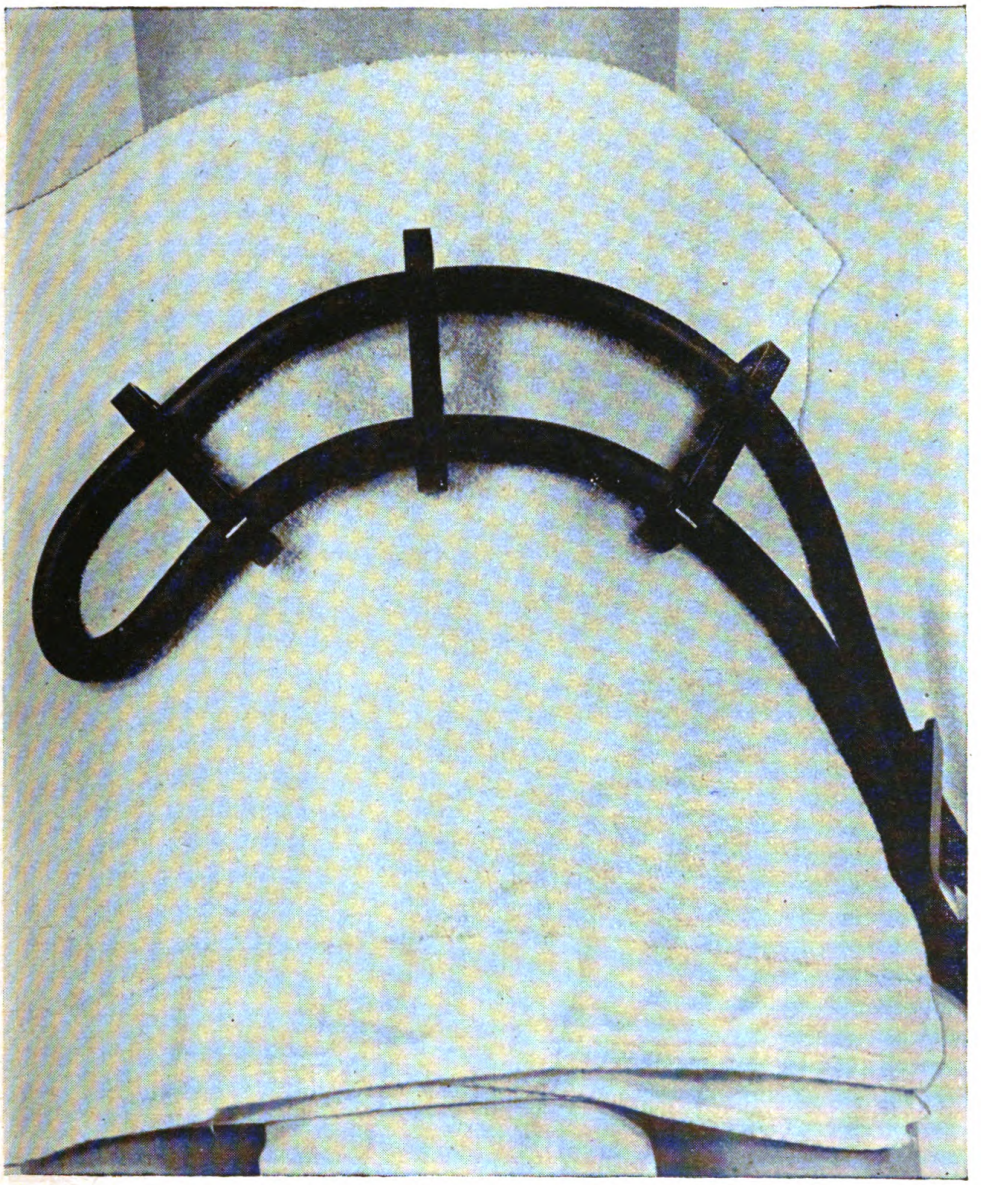
FIGURE 24. RELATION OF COIL TO PART.

Caution. Remove metal buckle. Folded heavy towel in each axilla, or arms well separated from body. Folded heavy towel between thighs. Hips and abdomen on pillow.

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BOTH HIPS AND LOWER SPINE AREA

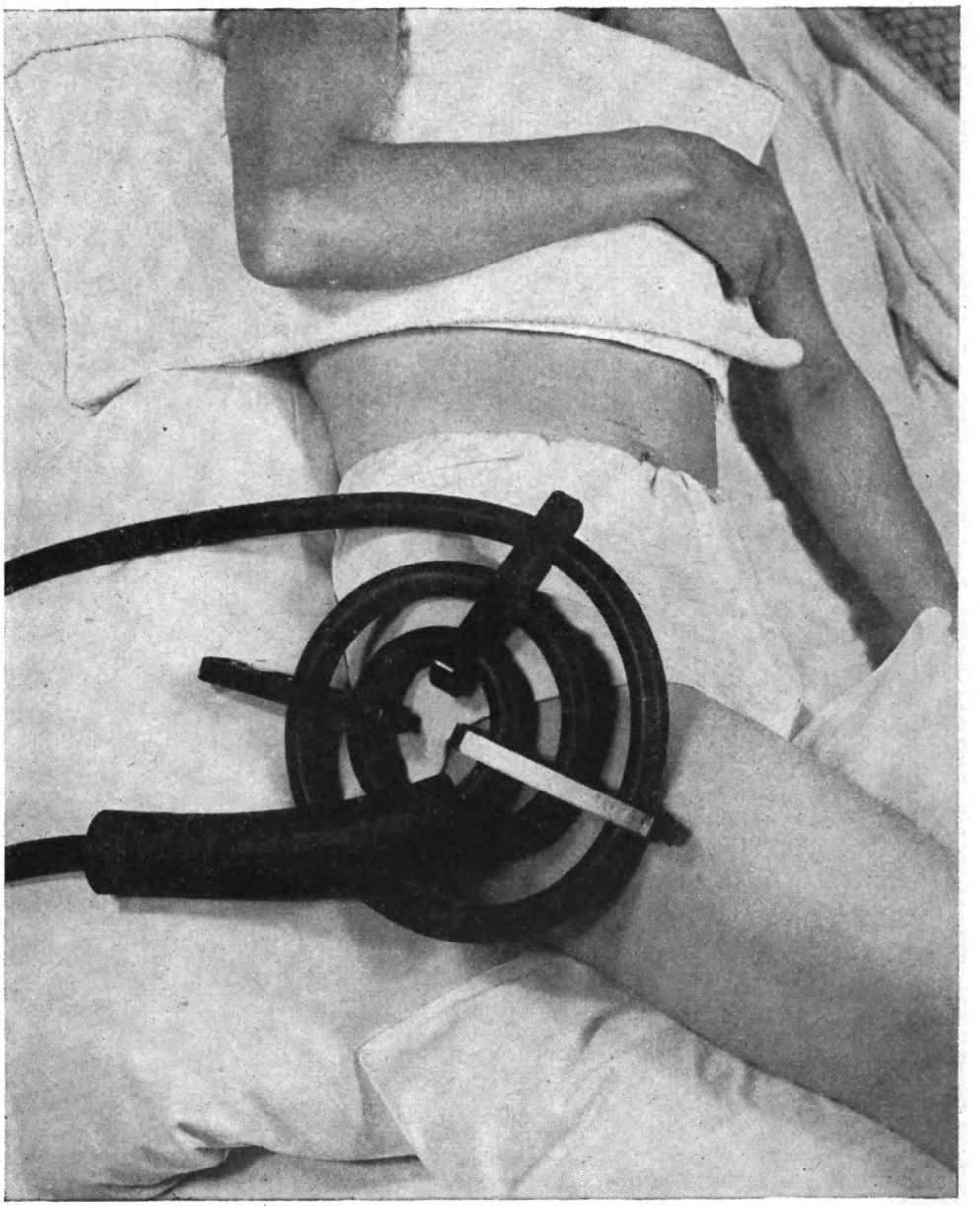


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FIGURE 24. RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: None.
Duration: 30 to 60 minutes.
Position: Prone.

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FIGURE 25. RELATION OF COIL TO PART.

Caution. Remove metal buckle. Folded heavy towel in each axilla, or arms well separated from body. Folded heavy towel or pillow between thighs. Hip elevated on pillow.

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FIGURE 25—RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: None.
Duration: 45 to 60 minutes.
Patient's position: Semi-lateral, or lying on side.

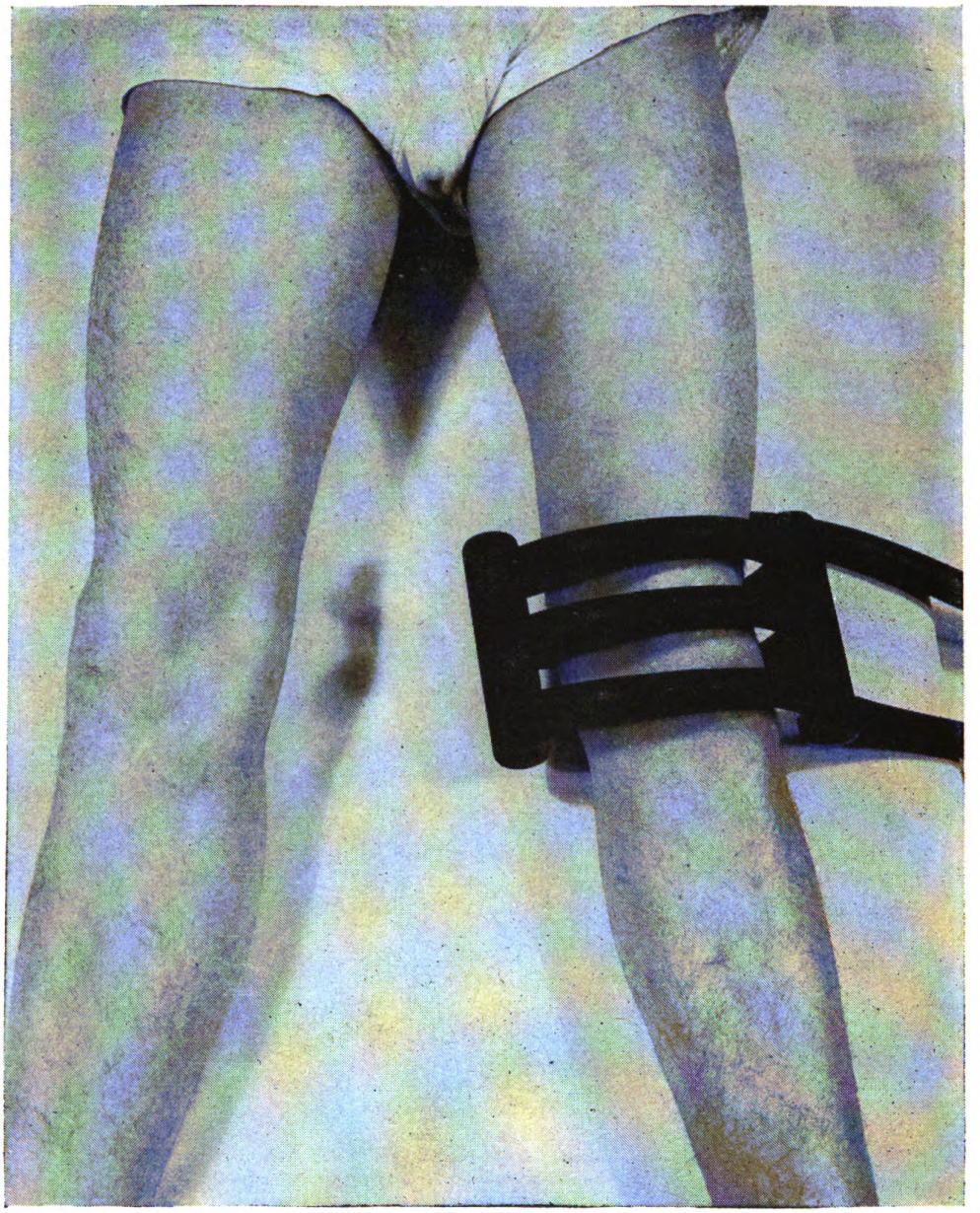
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FIGURE 27. RELATION OF COIL TO PART.

Caution. Remove metal sock holder. Folded heavy towel between thighs, or legs well separated. Knee elevated on pillow.

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FIGURE 27. RELATION OF COIL TO PART—continued.

Insulation: Six thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: None.
Duration: 30 to 60 minutes.
Patient's position: Supine or sitting.

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FIGURE 29. RELATION OF COIL TO CHAIR.

Caution. Twelve thicknesses of heavy dry toweling between chair and coil. Remove any metal connections to chair.

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FIGURE 30. RELATION OF COIL TO TOWELS AND CHAIR.

Insulation: Six thicknesses of heavy dry toweling over coil. Use more if there is wasting of buttock muscles.

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FIGURE 31. RELATION OF COIL AND INSULATION TO PART.

Insulation: Six or more thicknesses of heavy dry toweling.
Intensity: Moderate.
Danger: Abdominal cramps or desire to urinate, stop treatment.
Duration: 60 minutes.
Patient's position: Sitting.

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FIGURE 32. RELATION OF DISC TO PART FOR REFLEX VASODILITATION.

Caution. Remove all metal parts. Wrap both lower extremities with single towels. Comforter beneath legs as shown. Folded towel between thighs. Folded towel on arm where cable crosses it.

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FIGURE 32. RELATION OF DISC TO PART—continued.

Insulation: None under disc.
Intensity: Moderate.
Danger: Abdominal cramps, reduce intensity or stop treatment.
Duration: 60 minutes.
Patient's position: Supine.

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