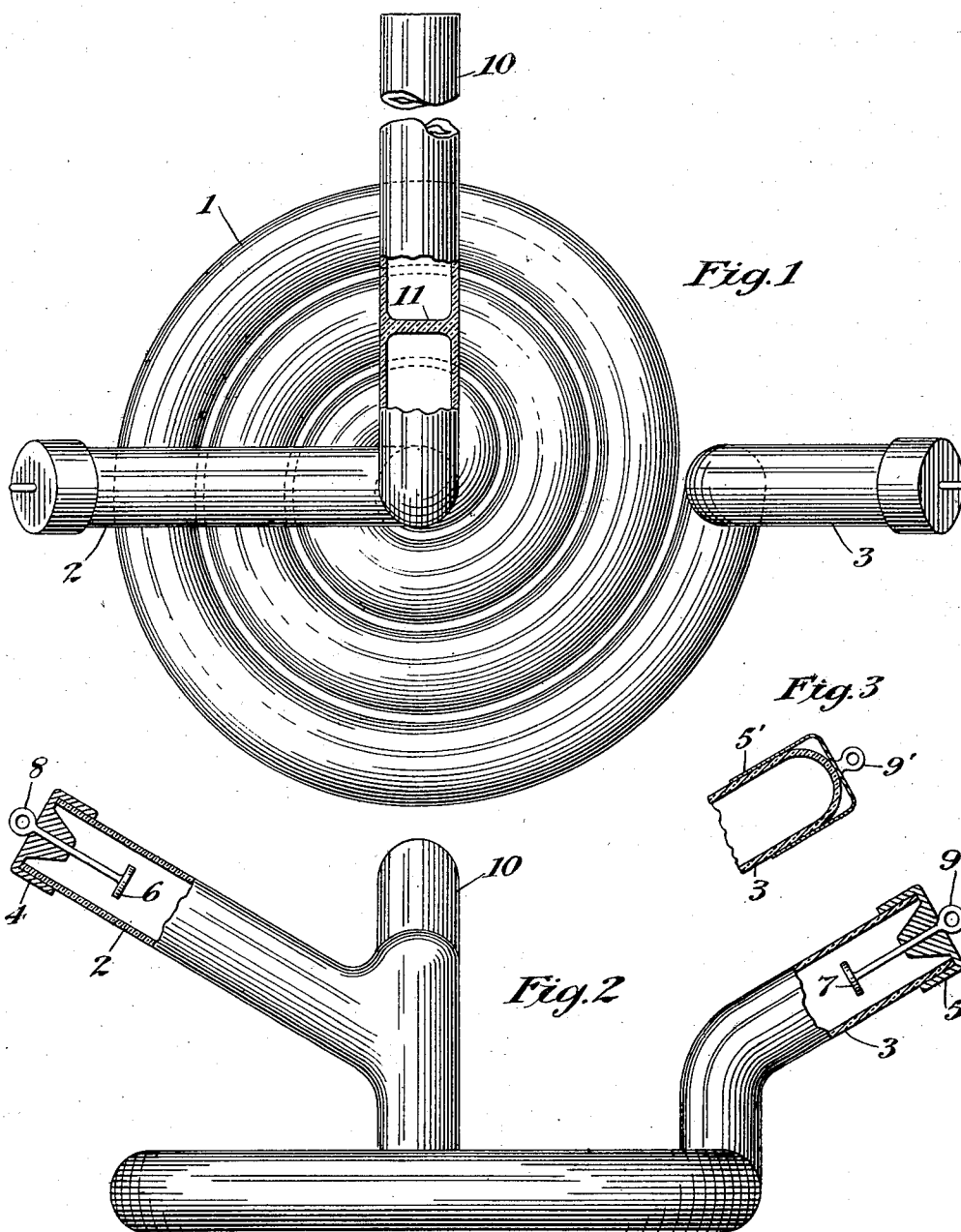


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SPIRAL VACUUM TUBE FOR THERAPEUTIC PURPOSES.

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NO MODEL.



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SPIRAL VACUUM-TUBE FOR THERAPEUTIC PURPOSES.

SPECIFICATION forming part of Letters Patent No. 754,079, dated March 8, 1904.

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To all whom it may concern:

Be it known that I, ROBERT MACHLETT, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Spiral Vacuum-Tubes for Therapeutic Purposes, of which the following is a specification.

This invention relates to vacuum-tubes used for therapeutic purposes, and is adapted to be used either for treatment with a high-tension and high-frequency current where the circuit is completed through the body of the patient or for treatment by means of the ultra-violet rays alone. Each of the above methods of treatment has its advantages in certain specific forms of disease in which the curative property of the X-rays and the ultra-violet light-rays has been demonstrated.

It has been found in many experiments made to investigate the therapeutic action of the rays upon the skin in the treatment of disease that when a high-tension current is passed through a vacuum-tube the air surrounding the tube is decomposed into ozone, and when the vacuum-tube is placed near or preferably in direct contact with the diseased portion of the skin this ozone attacks and destroys any toxic matter therein by oxidation. This action takes place whenever a vacuum-tube through which current is passing is used as described; but recent developments show that when the ultra-violet rays are present in large quantity the result is attained much more easily, and the nearer the rays can be brought to the diseased surface the more efficient will be treatment. It has been found that by using the body of the patient as one electrode of the tube—that is, by passing the current directly through the diseased portion from the tube—the ozone is generated in much greater quantities and much better results attained. In fact, in some cases cures are effected by this means which could not be reached by the ordinary methods. A serious difficulty experienced in passing the current direct to the body from the tube was that unless the contact-surface was relatively large and the current discharge distributed nearly uniformly over a large surface serious burns or very

painful sensations were caused by the concentration of the current at one point. Other experiments in electrotherapeutic treatments demonstrated that much better results were obtained with a tube of small diameter, so that the direct discharge or stream of rays between the terminals would entirely fill the tube, and also such a tube permits the use of a smaller terminal which does not absorb the gas as readily and so vary the vacuum of the tube. A further advantage of a tube of this description is that the direct rays can be brought much nearer to the portion of the body under treatment with the increased efficiency of results heretofore stated.

The object of this invention is to supply a tube which shall incorporate in its construction all of the features found to be necessary or desirable in the experiments heretofore mentioned and which shall be adaptable to the several uses stated in electrotherapeutic treatment, particularly in surface treatment or application. To accomplish this result, I provide a tube of relatively small and practically uniform diameter, which is preferably bent into a spiral form with projecting ends provided with electrodes or terminals of approved form. The advantage of this spiral form over many other shapes which have been tried by the inventor is that it is easily manufactured and is simple in its construction. All short bends, which are undesirable, are avoided and a uniform path of discharge is provided between the terminals. When this tube is applied to the body in light treatment, the rays are brought very near to the surface, and when used with one terminal for high-frequency treatment where the body of the patient forms the other pole the discharge between the tube and the body is distributed over a large surface, and owing to the corrugated form given to the contact-surface of the tube by the successive turns of the spiral a perfect contact over the entire surface is insured.

Referring now to the drawings accompanying this specification, Figure 1 represents a plan view of a tube such as described. Fig. 2 is a side elevation of Fig. 1.

At 1 is shown the central portion of a tube,

preferably of glass or other vitreous material transparent to the ultra-violet rays and which is bent into a spiral form, as described, and for the purposes hereinbefore stated. At 2 and 3 the ends of this tube are bent outward at a convenient angle to receive the terminal caps 4 and 5, carrying the electrodes 6 and 7, which may be of any approved form. At 8 and 9 suitable attachments are provided for the wires. A suitable handle may be provided for the use of the operator in applying the tube by forming an extension to the tube, such as 10, which may be separated from the operative and exhausted portion of the tube by a partition-wall, such as 11. When used for ordinary light treatment, both terminals are used and the discharge through the spiral is distributed over a large surface and also brought very close to the parts of the body under treatment. When used for high-frequency applications, only one terminal, preferably the one leading directly to the center of the spiral, such as 8, is used. The body of the patient forms the other terminal, and on account of the spiral form and corrugated contact-surface this discharge is distributed over a large area, providing a uniform application of the rays without danger of burning or other undesirable results. It is thus seen that this spiral form of tube possesses many advantages in the treatment of disease by the application of the ultra-violet rays to the diseased surface, and is therefore of great therapeutical value.

While I do not confine myself to the exact details of construction shown, I do hold and desire to cover in this patent a tube having a corrugated contact-surface of comparatively large area and which is preferably formed

by bending a tube of uniform and small diameter into a spiral form, which, it is evident, possesses many advantages and new functions not found in any tube heretofore mentioned.

In Fig. 3 is shown a form of terminal which may be used in connection with this tube and which has a particular advantage in not having any portion of said terminal inside of the tube itself. A thin metallic cap, such as 5', is provided to fit closely over the end of the tube. A suitable terminal for the wires, such as 9', may be added. The current on the inside of the tube being produced by induction is limited by the length of the cap 5', which is an advantage in cases where an excess of current might produce serious results.

What I claim is—

1. In a vacuum-tube for therapeutic purposes, the combination of a tube of relatively small diameter having a portion thereof so formed as to present a corrugated contact-surface, and one or more terminals adapted to supply current thereto, substantially as described.

2. In a vacuum-tube for therapeutic purposes, the combination of a tube of relatively small and uniform diameter having a portion thereof formed into a spiral presenting a relatively large contact-surface, and one or more terminals adapted to supply current thereto, substantially as described.

Signed at New York, in the county of New York and State of New York, this 21st day of January, A. D. 1904.

ROBERT MACHLETT

Witnesses:

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