Nov. 24, 1925. 1,562,460

W. D. McFEE

FULGURATOR

Filed April 26, 1922

FIG. 1

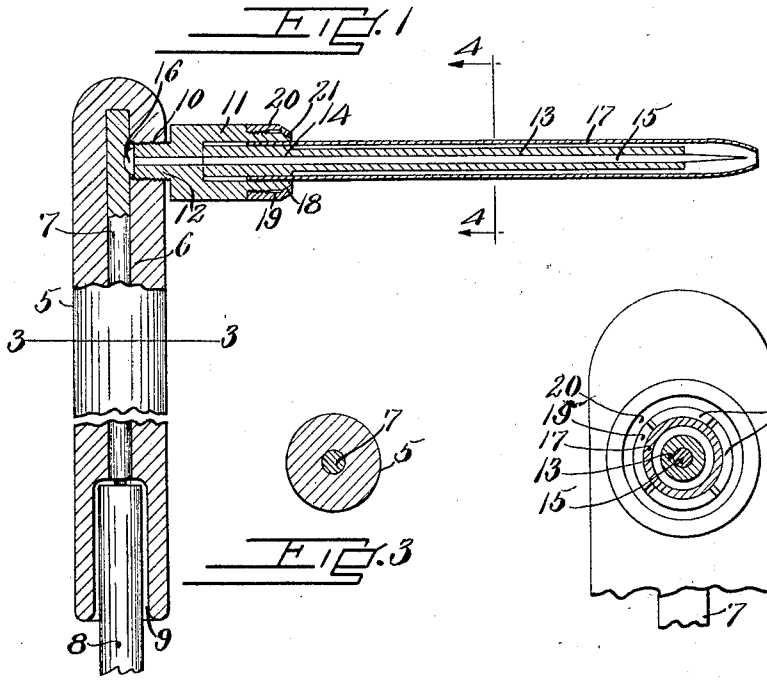


FIG. 3

FIG. 4

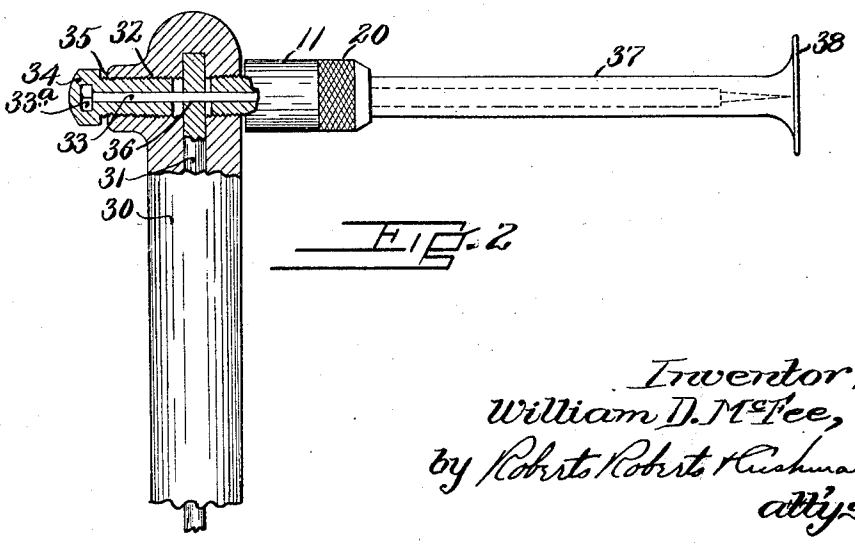


FIG. 2

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UNITED STATES PATENT OFFICE.

WILLIAM D. McFEE, OF HAVERHILL, MASSACHUSETTS.

FULGURATOR.

Application filed April 26, 1922. Serial No. 556,665.

To all whom it may concern:

Be it known that I, WILLIAM D. McFEE, a citizen of the United States of America, and resident of Haverhill, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Fulgurators, of which the following is a speecification.

This invention relates to therapeutical devices for producing a high frequency electrical discharge, and more particularly to a device of this kind for treating tonsils or other parts to which access is more or less difficult.

In the treatment of tonsils and other parts which are interiorly located, considerable difficulty has been experienced with devices of the type referred to for the reason that the electrical discharge frequently jumps from the electrode to parts other than the parts intended to be treated as the device is moved into and out of treating position and even while in such position. This is particularly true in treating tonsils where the tonsils are ordinarily located, at least in part, under other parts of the throat.

One object of the present invention is to provide a device of the character referred to in which the electrical discharge is restrained from jumping to parts other than those intended to be treated, and more particularly to prevent the discharge from jumping laterally from the electrode or in any direction other than forwardly from the end of the electrode.

Another object is to provide a quick and facile adjustment whereby the length of the gap across which the electrical discharge passes may be regulated and maintained constant during treatment without the operator being required to exercise a great amount of care in holding the device at the proper distance from the part to be treated.

Another object is to provide means for attaining the foregoing ends which may be readily sterilized and replaced or changed in case of breakage or in adapting the device to treat different parts of the throat.

According to the present invention the electrode is surrounded at its discharge end with a protector to prevent the electrical discharge from jumping laterally from the electrode and to cause the discharge to pass forwardly from the end of the electrode. The protector may have any one of the many forms depending upon the parts to be treated, but in any case it preferably extends beyond the end of the electrode so that the electrode cannot contact either with the part to be treated or any other part. The distance that the protector extends beyond the electrode may be varied to change the intensity of the electrical discharge, the discharge being less intense when the protector projects further beyond the end of the electrode inasmuch as the gap between the electrode and the part to be treated is then greater. For many purposes the protector may be shaped to contact with the part to be treated so that the discharge gap is accurately regulated by adjusting the distance from the end of the electrode to the end of the protector, and this distance may then be easily maintained constant during the treatment by virtue of the engagement of the protector with the part to be treated. This relative adjustment between the electrode and protector may be effected either by adjusting the protector longitudinally of the electrode or by adjusting the electrode longitudinally of the protector or by providing both of these adjustments. In treating exterior parts it is ordinarily sufficient to make the protector in tubular form with the small end only slightly larger than the end of the electrode, but for treating interior parts it is preferable in most cases to make the end of the protector relatively large so that the parts adjacent the part to be treated may be held away from the discharge by the protector. In treating certain parts, such as tonsils, where the adjacent parts tend to fold over the parts to be treated, the end of the protector may be provided with an exterior flange which may be slipped under such adjacent parts to hold them away from the discharge. In some cases it is desirable to make the end of the electrode relatively flat, as by making the aforesaid flange substantially radial, in order to bear on the part to be treated and to facilitate the holding of the electrode approximately perpendicular to the part to be treated.

In order to illustrate the invention typical species of the genus constituting the invention are shown by way of example in the accompanying drawings, in which,

Fig. 1 is an elevational view partly cut away and partly in section to show the structure;

Fig. 2 is an elevational view partly in section of a modification;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a section on the line 4—4 of Fig. 1.

The embodiment of the invention shown in Figs. 1, 3 and 4 comprises a portable fulgurator having a handle 5 of any suitable material preferably hard rubber. The handle 5 has a longitudinally disposed recess 6 to receive electrode 7. The electrical connection is provided by means of a flexible cable 8 entering the lower end of the handle and received in the enlarged portion 9 of longitudinal recess 6. Near the opposite end of handle 5 is a threaded socket 10 opening into the longitudinal recess 6. Member 11 is adapted to be mounted upon handle 5 by provision of an axial threaded extension 12 adapted to be received in socket 10. Member 11 has also a reduced axial extension 13 opposite to extension 12 and an axial bore 14 extending entirely through parts 11, 12 and 13 in which is received a discharge electrode 15, in this instance, in the form of a pin, the head 16 being adapted to contact with electrode 7 in handle 5. The point of electrode 15 extends beyond extension 13 and is kept from contact with parts to be treated by a protector 17 of any suitable material, preferably glass. Member 17 is preferably tubular in form and adjustably retained in position on member 11 by the provision of an annular depression or slot 18 in which protector 17 is received. The outer portion of member 11 overhanging recess 18 is reduced and longitudinally slotted to form the spring fingers 19 (Fig. 4) which are pressed into clamping engagement with protector 17 by means of a nut 20 screw threaded upon member 11, the outer ends of spring fingers 19 being beveled at 21 and contacted by an inwardly bent flange on nut 20.

The modification shown in Fig. 2 provides for the adjustment of both the protector and the discharge electrode. The form here shown has a handle 30 with an electrode 31 received in the longitudinal recess therein. The upper end of the handle has a bore 32 extending entirely therethrough and intersecting the slot in which electrode 31 is disposed. Into one side of bore 32 member 11, identical in all respects with the similarly indicated member in Fig. 1, is disposed. Discharge electrode 33, however, is longer than the corresponding electrode 15 in Fig. 1 and is suitably mounted in a nut 34 of insulating material such as hard rubber, as by molding the material when in plastic form about the head 33^a of the electrode. This nut has a reduced portion 35 provided with external threads adapted to be received in the bore 32 on the opposite side of the handle to member 11. When nut 34 with discharge electrode 33 is inserted through bore 32, the electrode passes through an opening 36 in electrode 31 and through the axial bore of member 11. Adjustably mounted on member 11 in Fig. 2 by the provision of clamping nut 20 is a modified form of protector 37 particularly adapted for the treatment of internal portions of the body. The outer end of protector 37 is preferably flared and provided with a radial flange 38 which may be placed in direct contact with the part of the body to be treated, the flange keeping other portions of the body out of range of the discharge and the flared opening confining the discharge to the parts enclosed thereby. In this modification, the protector 37 is adjustable longitudinally of the discharge electrode 33 by loosening nut 20 and moving protector 37 inwardly or outwardly as desired in the same manner as in Fig. 1. The discharge electrode 33 is further adjustable in respect to protector 37 by turning nut 34 in which the electrode is fast.

Protectors 17 and 37 serve to keep the discharge from spreading laterally and reaching parts of the body which do not need treatment. Protector 17 is particularly adapted for external treatment, the narrow orifice therein directing the discharge directly forward from the discharge electrode and preventing the electrode from coming in contact with the body. Protector 37 functions in a similar manner but permits a wider range of discharge. Its bell shaped end permits effective localization of the discharge. By loosening nut 20, protectors 17 and 37 can be quickly removed for the purpose of sterilizing them or for substituting sterilized protectors or for putting on protectors having different shaped tips.

I claim:

1. A therapeutic fulgurator having a handle, a member mounted on said handle and extending angularly therefrom, a discharge electrode on said member and projecting therefrom, a protector surrounding the discharge end of said electrode, and means for adjusting said electrode relative to said protector.

2. A therapeutic fulgurator having a handle, a member attached to said handle and having a reduced outer portion and an axial bore, a discharge electrode in said bore extending beyond said outer portion, a longitudinally extending annular groove in said member adjacent said reduced portion, and a protector adjustably supported in said groove and extending beyond said electrode to resist transverse discharge therefrom.

3. A therapeutic fulgurator having a handle, a member attached to said handle and

having an axial bore, a discharge electrode in said bore extending beyond said member, spring fingers on said member, and a protector surrounding the projecting end of said electrode to control the direction of the discharge, said protector being adjustably held by said spring fingers.

4. A therapeutic fulgurator having a handle, a member attached to said handle and having an axial bore, a discharge electrode in said bore, means for adjusting said electrode longitudinally of said member, and a protector mounted on said member and extending beyond said electrode to maintain the latter out of contact with the parts to be treated.

5. A therapeutic fulgurator having a handle, a discharge electrode projecting from the handle, a protector surrounding the electrode, and means on the handle adjustably securing the protector in position, said means including spring fingers engaging the protector and means for clampingly securing the fingers in engagement with the protector.

Signed by me at Boston, Massachusetts, this 18th day of April, 1922.

WILLIAM D. McFEE.