

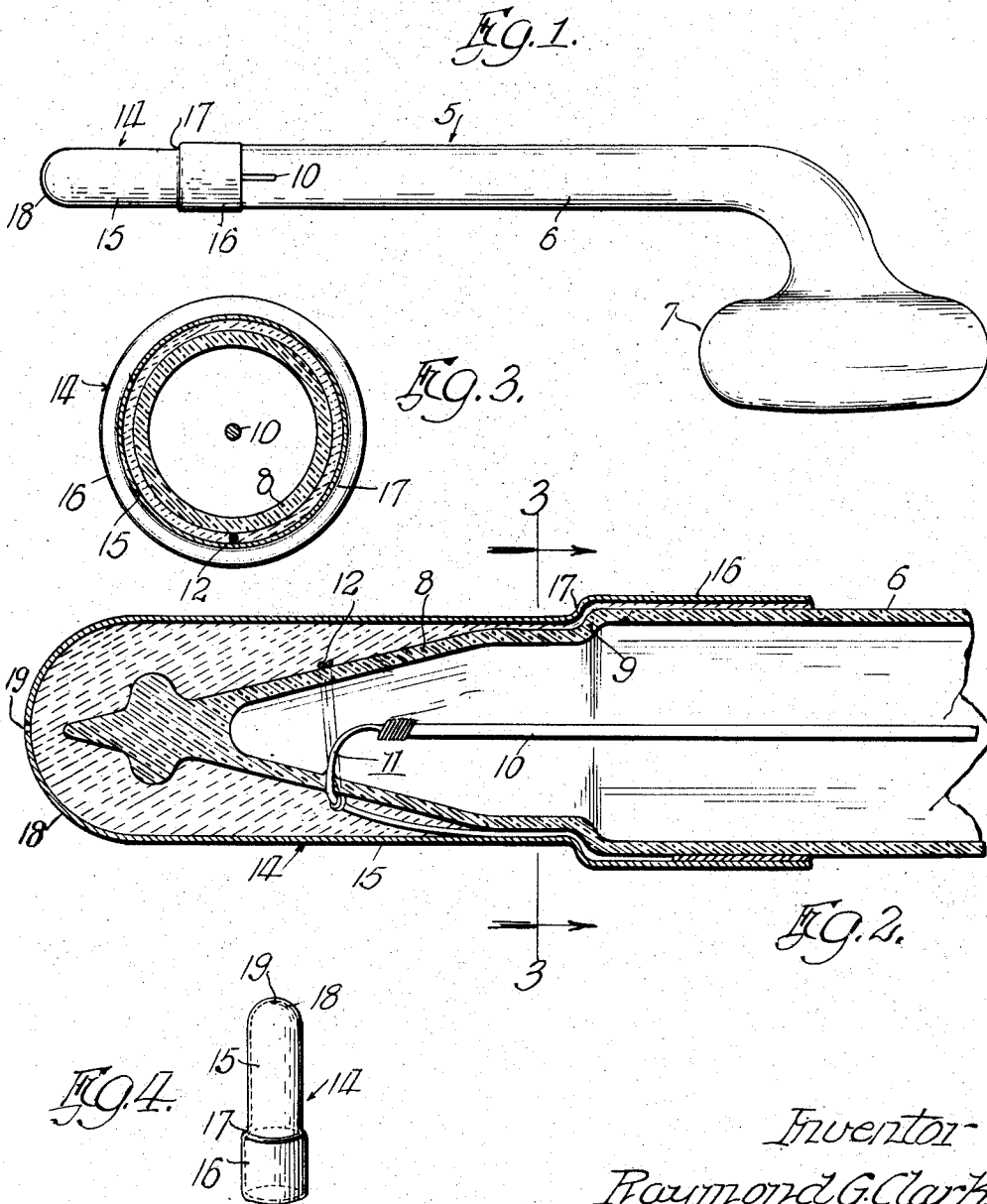
Jan. 19, 1926.

1,570,041

R. G. CLARK

ELECTRODE FOR HIGH FREQUENCY GENERATORS

Filed March 12, 1923



Inventor
Raymond G. Clark
by Clarence E. Wellhouse
Att'y.

UNITED STATES PATENT OFFICE.

RAYMOND G. CLARK, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
ADOLPH W. GAST, OF CHICAGO, ILLINOIS.

ELECTRODE FOR HIGH-FREQUENCY GENERATORS.

Application filed March 12, 1923. Serial No. 624,334.

To all whom it may concern:

Be it known that I, RAYMOND G. CLARK, a citizen of the United States, and a resident of Chicago, Illinois, have invented certain new and useful Improvements in Electrodes for High-Frequency Generators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in electrodes primarily designed for use with high frequency generators in therapeutic treatment, and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

An electrode of the kind, comprises an exhausted tubular glass body or stem with an operating head at one end and with the other end drawn and sealed to provide a glass extension of reduced diameter, through one side of which a conducting wire extends from the electrode rod within the body to a position for engagement and electrical connection with a metal terminal cap, which is sealed on said extension and is adapted for insertion into the socket at the end of the handle connected to the generator. As heretofore constructed, the metal terminal cap has been attached to the reduced end of the tubular glass body only,—terminating at the annular shoulder formed at the point where the part of the glass tube of reduced diameter meets the part which is of larger diameter.

It has been found that electrodes with terminal caps of the kind are apt to break in the neighborhood of the aforesaid shoulder, and this tendency to break is increased because of the fact that an operator, when withdrawing the electrode from the handle of the generator, is very likely to attempt to dislodge the electrode from the handle, in case it sticks therein, by swinging the electrode from side to side, instead of pulling it straight outwardly in the line of its longitudinal central axis.

The object of the invention is to provide a novel and improved terminal construction for the electrode, whereby a strong and efficient connection or joint is made between

the tubular glass stem of the electrode and the metal terminal cap is made to reinforce the tube at the point where the reduction in diameter begins, so that the danger of breakage in the plane of the shoulder above referred to, when inserting or removing the electrode from the handle of the generator or otherwise, is reduced to a minimum.

This object of the invention as well as its advantages will be more fully set forth as I proceed with my specification.

In the drawings:—

Fig. 1 is a view representing a side elevation of an electrode of the kind mentioned, embodying my invention.

Fig. 2 is a longitudinal, central, sectional view on an enlarged scale, of the terminal cap end of the electrode.

Fig. 3 is a transverse, sectional view in a plane indicated by the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the terminal cap of the electrode.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawing:—5 indicates an electrode embodying the novel improvements of the invention. 6 indicates the tubular body of the stem of the electrode, which is of small cross section, as compared to its length; 7 indicates the operating head, which may be of any well known form, depending upon the treatment to which it is to be applied, and as shown, is in the form of an enlarged, flat, bulb-like head, arranged with its central axis at substantially a right angle to that of the body, and is adapted for surface application to the parts to be treated; 8 indicates the terminal end of the glass stem, which is reduced in diameter and is tapered as shown, with an annular shoulder 9 formed at the point of reduction; 10 indicates the electrode rod within the stem; 11 indicates a wire conductor, having one end connected to the electrode rod 10 and having the other end extended through an opening in the reduced end 8 of the stem, being sealed therein, and then extending forwardly into contact with the metal terminal cap; 12 indicates a wire wrapped about the reduced end and adapted to assist in holding the conducting wire in place and from slipping down towards the part of the reduced stem end of smaller diameter; and 14 indicates the metal ter-

minal cap. All of the parts above described, except for the terminal cap, are as they have been made heretofore.

The terminal cap 14 consists of a tubular body 15 of somewhat larger diameter than that of the reduced end 8 of the glass stem, and of a length sufficient to completely enclose said reduced end, and of a ferrule extension 16 at its forward end, of a diameter slightly greater than the stem 6 of the electrode. The terminal cap is thus formed with an annular shoulder 17 corresponding to and adapted to engage in the neighborhood of the transverse shoulder 9 in the glass stem. The end of the metal terminal cap is spherical, as indicated at 18, there being provided therein the usual vent opening 19.

The metal terminal end is applied to the stem in the usual manner, being first partially filled with cement and then forced on the stem until the annular shoulder 17 is brought up against the annular shoulder 9 in the glass stem, the cement filling the space between the inner surface of the tubular metal cap and the tubular body of the glass stem, and the conductor wire 11 being engaged against the inner surface of the metal terminal cap so as to make electrical contact therewith. The excess of cementitious material escapes through the vent opening 19.

With the ferrule extension 16 embracing the end of the glass stem 6 forward of the shoulder 9 and sealed thereon, any strain on the end of the metal cap tending to impart a shearing strain to the reduced end 8 of the glass stem in or near the transverse plane of the annular shoulder 9, will be resisted by the ferrule extension 16, and the main part of the stem 6 which is of the larger diameter.

The advantage of a construction of the kind and its strength compared to terminal caps attached to the stems of electrodes as heretofore, will be manifest to those familiar with the art.

A distinctly improved result is brought about in the novel electrode when attaching the terminal cap to the glass tubular body of the electrode. This arises from the fact that the ferrule extension 16 is engaged and sealed upon the tubular body or stem 6, and since said ferrule extension is of substan-

tial length, an exact alignment of the longitudinal central axis of the terminal cap with the longitudinal central axis of the tubular stem or body is insured and such alignment is in no way effected by any lack of alignment in the reduced end part 8 of the glass stem.

Another advantage of the present invention is brought about by the fact that a larger superficial contact is made between the ferrule and the tubular stem of the electrode, thereby distributing the potential strain between the terminal cap and the glass stem of the electrode over a larger area.

In constructions as heretofore, where the terminal cap ends at the shoulder formed between the reduced end and the main body of said stem, a potential strain is produced, which will fatigue, age and tend to make the glass brittle, resulting in easy breakage at that point. This effect is particularly noticeable in electrodes of the kind where the electrode rod 10 is omitted.

I claim as my invention:—

1. In an electrode of the kind described, the combination of a tubular glass body having a reduced end extension and a terminal cap enclosing and being cemented to said reduced end and including a part extending beyond said reduced end part to embrace a part of said tubular body.

2. In an electrode of the kind described, the combination of a tubular glass body having a reduced end extension, the junction of said body and end extension providing an outwardly extending annular shoulder, and a terminal cap adapted to fit over said reduced end, said cap including a ferrule like extension at its open end, the junction of said body and ferrule extension of said cap providing an inwardly extending annular shoulder adapted to coact with said shoulder on the body, said ferrule extension being adapted to extend beyond said coacting shoulders to embrace a part of said body, and a cementitious material for securing said cap to the body.

In testimony that I claim the foregoing as my invention I affix my signature this 28th day of February, 1923.

RAYMOND G. CLARK.