

July 1, 1924.

1,499,341

W. J. CAMERON

DENTAL PULP TESTER

Filed March 20, 1922

Fig. 1.



Fig. 2.

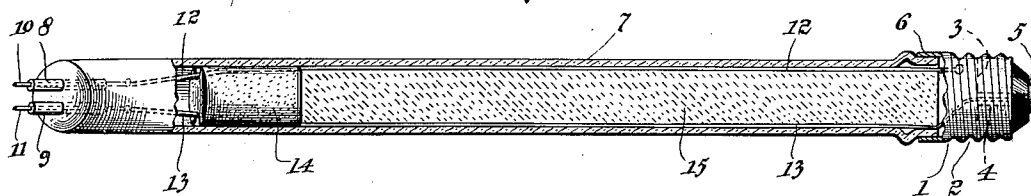
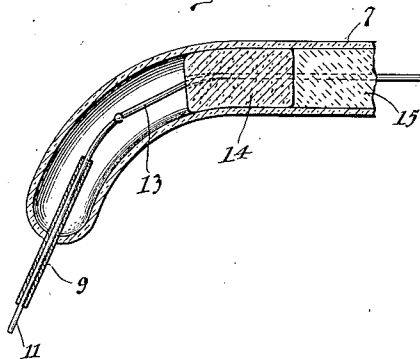


Fig. 3.



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Patented July 1, 1924.

1,499,341

UNITED STATES PATENT OFFICE.

WILL J. CAMERON, OF CHICAGO, ILLINOIS.

DENTAL PULP TESTER.

Application filed March 20, 1922. Serial No. 545,392.

To all whom it may concern:

Be it known that I, WILL J. CAMERON, a subject of the King of Great Britain, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dental Pulp Testers, of which the following is a specification.

My invention relates generally to surgical and dental appliances, and more especially to the class of such appliances that are used in making examinations and diagnosis of teeth to determine the condition of the enamel, and generally the nervous condition and sensitiveness of the parts under examination.

It frequently occurs that a nerve dies before there is even a minute fracture in the enamel and sometimes the enamel has been worn substantially through the dentine without affecting the nerve of that tooth. I have found that a mild electric current will disclose the condition of the enamel and also by the reflex may ascertain the nervous condition below the enamel without any danger of affecting either of these parts or the patient who is undergoing diagnosis. I am enabled in this way to find defects in the enamel that are so small as to be below the range of visibility, and I am also able to determine the sensitiveness of the nerves over very limited areas without subjecting the patient to extreme pain or causing the tissue to be irritated or damaged. While this appliance has been primarily designed for use by dentists for the testing of teeth and ascertaining the physical and nervous condition thereof, it of course is capable of employment for purposes other than those herein described.

I prefer to carry out my invention in the manner disclosed in the accompanying drawings which show a preferred embodiment thereof.

In the drawings;

Figure 1 is a schematic face view of a patient illustrating one method in which my appliance may be used.

Figure 2 is a longitudinal elevation of my appliance a portion thereof being in longitudinal section, and the view being enlarged.

Figure 3 is a sectional detail of the operation end of my appliance.

In the drawings, it will be seen I have employed the same reference characters to

designate like parts throughout the views, and said drawings disclose a typical structure for testing teeth and the nerves thereof. The structure shown comprises a plug which consists of a cylindrical metallic shell 1 having a threaded portion 2 in which is positioned a suitable non-conducting closure 3 having a central opening 4 therethrough, and which has a central contact element or terminal piece 5 upon the exterior thereof. One portion 6 of the shell of the plug is smooth and receives the end of the main body or casing 7 of the appliance which is securely attached by a moisture-proof and chemical proof adhesive or cement. This body 7 is preferably a tube of what is commercially known as "milk" glass of the desired length and diameter, and its end opposite shell 1 is closed and may be either curved in arc-shape, as shown in Figures 1 and 3 of the drawings, or it may continue straight to its end as will be readily understood.

Imbedded or fused in the glass closure at the end of the body are a pair of metallic tubes or bushings 8 and 9 that are arranged with their axes substantially parallel with each other and extending substantially parallel with the axis of the adjacent end of the body. These tubes 8 and 9 act as guides or holders for a pair of very small terminals 10 and 11, respectively, that fit snugly in the bores of said tubes and have their ends extended or projected beyond the inner and outer ends of the tubes, as seen. I prefer to form these terminals of nickel or other similar material so that they will not readily oxidize. The inner ends of these terminals are soldered or otherwise suitably secured to conductors 12 and 13 extending throughout the length of the body and the shell, and lead, respectively, to the wall of shell 1 and to the central terminal piece 5 heretofore mentioned.

In order to spread conductors 12 and 13, and retain them separated to their greatest extent, I interpose therebetween in the body adjacent the operating end of the latter a suitable spreader 14 in the form of a plug that is preferably of non-conducting material of fibrous character, such as wool-felt or wood-pith which is of a diameter sufficient to tightly fit the bore of the body element 7 after it has been forced into the latter. The conductors are also retained in spaced or separated positions and close to

the interior surface of the body by filling the remaining portion of said body back of plug 14 with a cementitious material 15 such as plaster-of-Paris, or the like, and, after this filling operation, (which need not be here described), the ends of the conductors which are connected with the terminal pieces 10 and 11 are secured to respectively shell 1 and the terminal piece 5, as heretofore alluded to.

When the appliance is screwed into a suitable socket and the electric current switched on the operator may touch the extended or projected ends of terminals 10 and 11 preferably to the exposed portions of the teeth under examination, and in the event the enamel or outer shell thereof is broken or worn thin the patient will immediately receive a light shock, but where the nerve has been retracted and absorbed the enamel will complete the circuit without shocking the patient. It will be understood that the appliance is not ordinarily operated in connection with the full service current, but usually this current is first passed through reducers or resistance devices to materially cut down the voltage and according to the amount of current required for a reflex will determine the physical condition of the dentine and the nerve.

It will be appreciated that I may modify the precise structure shown in the drawing without materially departing from the principles of my invention, and in this connection it may be stated that the tubular bushings 9 and the spacing plug 14 may be omitted, and the terminals 10 and 11, if sufficiently stiff may be embedded in the end of the glass tube in the same manner as the bushings. All such alterations are therefore contemplated as coming within the scope of my invention as expressed in the appended claims.

What I claim is:—

1. A surgical and dental appliance comprising an electric plug connector, a tubular body mounted therein and extending therefrom; said body being closed at the end opposite said plug, tubular bushings extending through the closed end of said body, terminals mounted in said bushings, and conductors leading from said terminals to the respective electrical elements of said plug.

2. A device for testing defective teeth comprising a plug connector, a tubular body, one end thereof being secured to said plug and its opposite outer end being closed, and

electrical conductor elements leading from said plug and extended through the closed end of said body; said conductor elements being spaced apart throughout their length whereby when the outer ends of said conductor elements are placed in contact with a tooth a circuit is formed across said conductors.

3. A surgical and dental appliance comprising a tubular body closed at its outer end, terminals extended through the closed end of said body, conductors leading from said terminals to the opposite end of said body, a spacing plug within said body adjacent the inner ends of said terminals and spacing said conductors, and an electrical plug connector connecting said conductors with a suitable electric circuit.

4. A surgical and dental appliance comprising a tubular body closed at its outer end, terminals extended through the closed end of said body, conductors leading from said terminals to the opposite end of said body, a spacing plug within said body adjacent said terminals, an insulating filler within said body and spacing said conductors, and a plug connector at the opposite end of said body and electrically connected with said conductors.

5. A surgical and dental appliance comprising an elongated-tubular body having its outer end bent laterally and closed, terminals extended through the closed end of said body, conductors leading from said terminals to the opposite end of said body, a spacing plug within said body adjacent the inner ends of said terminals and spacing said conductors, and an electrical plug connector connecting said conductors with a suitable electric circuit.

6. A surgical and dental appliance comprising an elongated tube closed at its outer end, terminals disposed in spaced relation and extended through the closed end of said tube, an electrical plug connector closing the opposite end of said tube, and conductors leading from the portions of said terminals within said tube; said conductors extending to the opposite end of said tube in spaced relation to each other and connected to the respective elements of said plug connector whereby said terminals are connected with a suitable electric circuit.

Signed at Chicago, county of Cook and State of Illinois, this 3rd day of February, 1922.

WILL J. CAMERON.