March 29, 1927. 1,622,887

W. SMITH

METHOD OF DIAGNOSTIC ANALYSIS

Filed Aug. 3, 1925

Fig. 1.

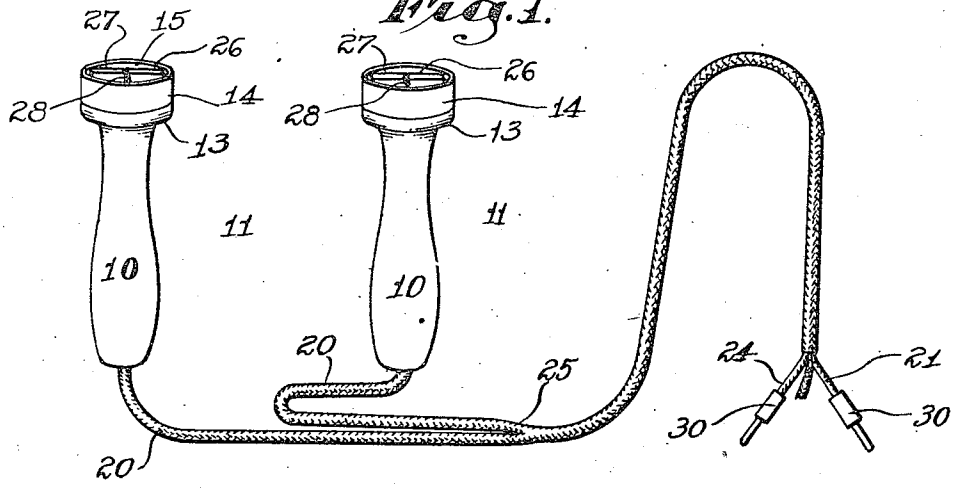


Fig. 2.

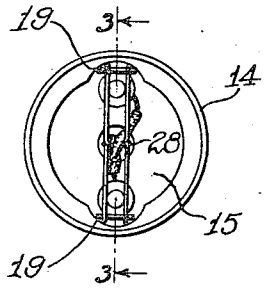


Fig. 3.

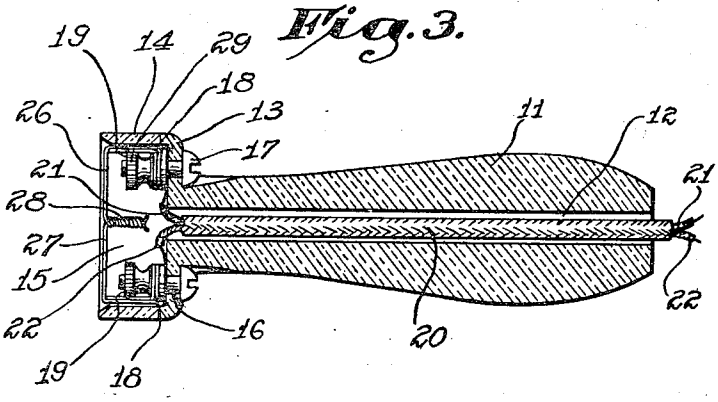
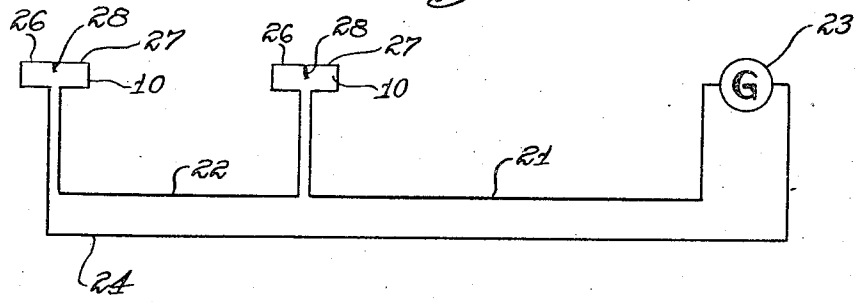


Fig. 4.



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UNITED STATES PATENT OFFICE.

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METHOD OF DIAGNOSTIC ANALYSIS.

Application filed August 3, 1925. Serial No. 47,670.

This invention relates to a new and improved method of detecting differences in temperature in various parts of the human body.

At the present time, in order to find out if the portion of the body under examination is feverish or if there is a congestion present, the doctor often pounds or taps the portion of the body under observation with his hands and if the pounding or tapping hurts the patient this usually satisfies the doctor that there is a congestion present. This method is ineffective and often harmful to the patient. It is a primary object of the present invention to provide a method whereby any differences in temperature of the various parts of the body due to congestion or local trouble will be positively detected.

Other objects and advantages of the invention will be apparent from the description to follow taken in connection with the accompanying drawing in which—

Figure 1 is a perspective view of the pair of thermocouples and conductors attached thereto, used for carrying out the improved process.

Figure 2 is an enlarged top plan view of one of the thermocouples shown in Figure 1.

Figure 3 is an enlarged longitudinal view of one of the thermocouples taken on the plane indicated by the line 3—3 of Figure 2 and looking in the direction of the arrows.

Figure 4 is a diagrammatic view of the thermocouples connected to a galvanometer.

Referring to the figures of the drawing in detail, the apparatus used for carrying out the improved method comprises a pair of thermocouples indicated generally at 10. Each thermocouple 10 is formed with an elongated handle portion 11, cylindrical in shape so as to be conveniently grasped by the hand of the operator. This handle portion 11 may be made of wood or other suitable material. Passing through the center of the handle portion 11 is a bore 12. The handle 11, at one end thereof, terminates in a flared or shouldered portion 13. Mounted on the upper periphery of said shouldered portion 13 and secured thereto by glue or other suitable substance is a collar or ring member 14 formed of rubber or mica or other suitable substance. By reason of this construction, a chamber 15 is formed, which chamber 15 communicates with the bore 12 in the handle 11 for a purpose which will be presently explained. Formed in the shouldered portion 13 and on either side of the handle portion 11 is an opening 16. Mounted in each of said openings 16, is a screw 17. Mounted on the shank of each of the screws 17 is a bridge member, said bridge member consisting of a flat base 18 having a central opening through which the shank of the screw 17 passes, and an upstanding web portion 19, substantially T-shaped, which T-shaped portion when in position on the screw 17 extends upwardly to a point substantially adjacent the upper edge of the chamber 15.

Extending through the bore 12 of the handle 11 of one of the thermocouples and protected by an insulated covering 20 are conductors 21 and 22. The conductor 21 is connected to the shank of one of the screws 17, and the conductor 22 is connected to the shank of the other of said screws 17 in said thermocouple. The conductor 21 leads to the positive post of a galvanometer shown diagrammatically at 23, said galvanometer being provided with the usual scale and pointer (none of which is here shown). Passing through the bore 12 of the handle 11 of the other of the thermocouples 10 is a conductor 24 which is connected to the shank of one of the screws 17 and leads to the negative post of the galvanometer 23. Also passing through said bore 12 is the other end of the conductor 22, which end of said conductor 22 is secured to the other of the screws 17, both of said conductors 24 and 22 being provided with an insulated covering. The conductor 22 joins the conductors 21 and 24 at the point indicated at 25 in Figure 1 and permits a limited movement of the thermocouples with respect to each other.

Attached to the shank of one of the screws 17 and connected to the conductor 21 is a wire 26, which wire 26 is looped around said shank and its free ends brought upwardly over the T-shaped web portion 19 of the bridge member, said free ends then extending across the top of the chamber 15 to a point about the center thereof. Secured to the shank of the other screw 17 and connected to the conductor 24 is another wire 27, which wire 27 is also looped around the shank of the screw 17 and its free ends brought upwardly over the T-shaped portion 19 of the bridge member, the said free ends of said wire 27 extending across the top of the chamber 15 to a point about the

center thereof where the ends of the wire 27 are joined to the ends of the wire 26, forming a union or juncture 28. The wire 26 is formed of a different metal than the wire 27, and I secure the best results by using one wire made of copper and the other made of constantan. To removably secure the bridge member and the conductors on the screws 17, a nut 29 is provided for each screw 17. As will be understood, the conductors 21 and 24 are connected to the galvanometer 23 by means of plugs 30.

In practice, the method used to detect the difference in the temperature of the body is as follows: the conductors 21 and 24 having previously been connected to the galvanometer 23, one of the thermocouples 10 is placed on any desired part of the body of the patient where the temperature is normal. The normal heat of the body passing through said thermocouple to the galvanometer pushes the indicator on said galvanometer to one side of the zero mark. Then the other thermocouple is placed on another part of the body or various parts thereof until a part is found that is of the same temperature as the part on which the first thermocouple was placed. This is told by reason of the indicator on the galvanometer returning to zero mark because the temperatures at both points are the same, which also indicates that both parts of the body on which the thermocouples are placed are of normal temperature. This step is necessary in order to prove that both parts are healthy and normal. When two parts of the body are thus found to be normal in temperature, the temperature on the galvanometer indicated by either of said parts is used as a standard or criterion by which to judge the condition or temperature of other parts of the body with relation thereto. This is accomplished by leaving one of said thermocouples on the part of the body where it was placed and removing the other from the body which will result in the indicator being pushed again to one side of the zero mark to indicate the temperature of said part of the body against which the thermocouple is placed. The other thermocouple which has been removed from the body is then moved over the body or the portion thereof under observation and when the said thermocouple comes into contact with a part of the body that is feverish or has a temperature or has a variation in temperature from that of the part of the body on which the fixed thermocouple is placed, the heat given off by said feverish portion is transferred to the union 28 of the wires 26 and 27 of said thermocouple and passes through said thermocouple and its connections and moves the indicator on the galvanometer to either side of its zero mark.

I claim:

1. The herein described method of diagnostic analysis using a pair of thermocouples and a galvanometer, which consists in applying the thermocouples to two separated healthy tissue portions of the body spaced vertically from the afflicted portion to give a zero reading on the galvanometer, then removing one of said thermocouples and applying it to the portion of the body under observation and note the direction and degree of deflection of the galvanometer, and removing the other thermocouple and applying it to another portion of the body substantially horizontal with the portion under observation to obtain a galvanometric reading and determine the extent of inflammation.

2. The herein described method of diagnostic analysis using a pair of thermocouples and a galvanometer, which consists in applying the thermocouples to two separated healthy tissue portions of the body spaced vertically from the afflicted portion to give a zero reading on the galvanometer, then removing one of said thermocouples and applying it to the portion of the body under observation and noting the direction and degree of deflection of the galvanometer, then removing the other thermocouple and applying it to another portion of the body substantially horizontal with the portion under observation to obtain a galvanometric reading and determine extent of inflammation, and finally proving existence of the diseased tissue by removing one of the thermocouples from the said horizontal position and applying it to a known healthy portion of the body and noting the direction and amount of deflection of the galvanometer.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

WILLIAM SMITH.