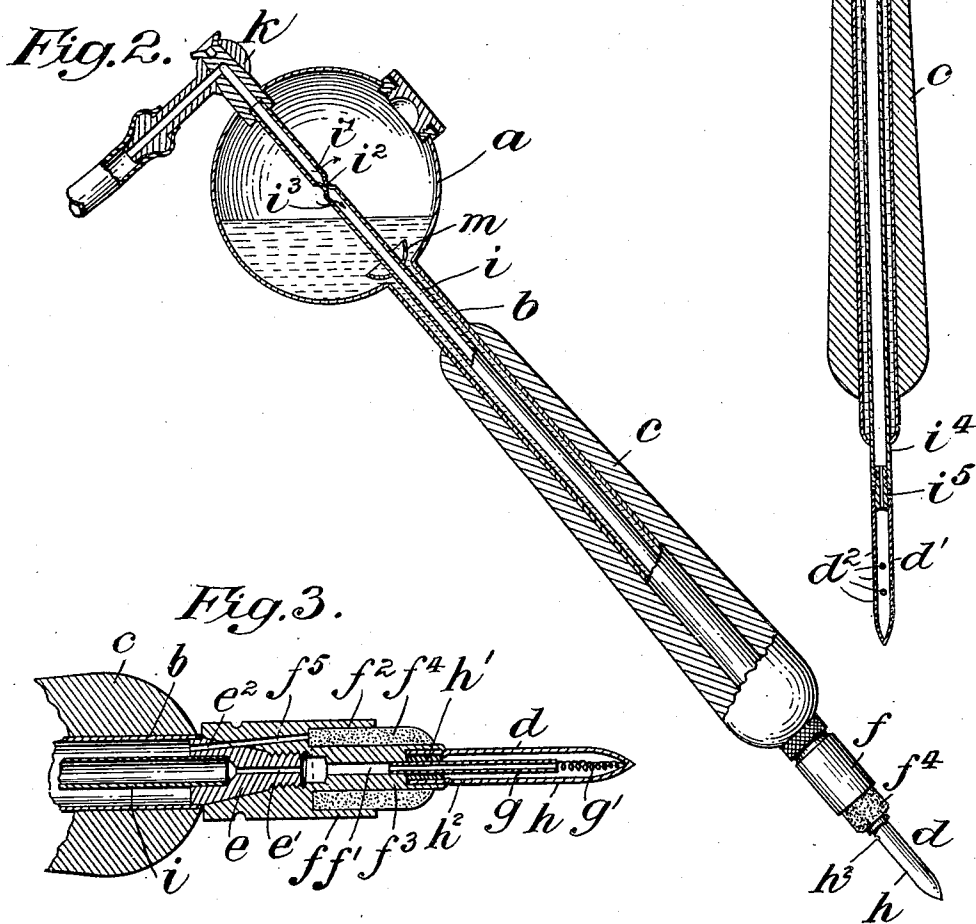
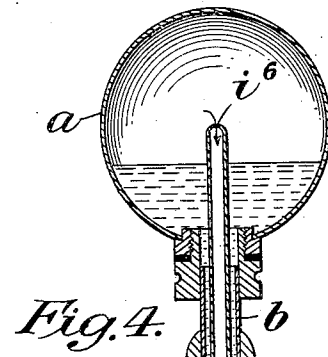
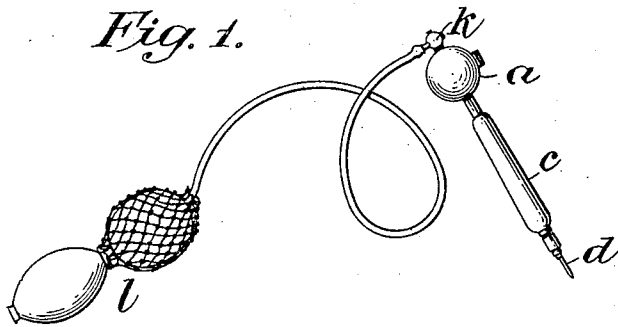


J. P. MÜLLER.
THERMOCAUTER.
APPLICATION FILED JULY 13, 1909.

946,556.

Patented Jan. 18, 1910.



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UNITED STATES PATENT OFFICE.

JOHN P. MÜLLER, OF NEW ROCHELLE, NEW YORK.

THERMOCAUTER.

946,556.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN P. MÜLLER, a citizen of the United States, residing in the city of New Rochelle, county of Westchester, in the State of New York, have invented certain new and useful Improvements in Thermocauters, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to instruments, such as are used in surgery as cauteries and in the art of pyrography as tools for burning wood, leather, etc., and it has for its object to produce an instrument of this character which shall be specially adapted for the use of alcohol as a burning fluid, and otherwise to improve the construction of such instruments.

The invention will be more fully explained hereinafter with reference to the accompanying drawing in which—

Figure 1 is a view in elevation of the improved thermocauter with the usual devices for supplying air connected therewith. Fig. 2 is a detail view on a larger scale, partly in longitudinal section and partly in elevation, of the thermocauter shown in Fig. 1. Fig. 3 is a detail view, on a still larger scale, in longitudinal section, through the point. Fig. 4 is a view in longitudinal section of a slightly different form of the thermocauter shown in Fig. 2.

The thermocauter shown in Figs. 1, 2 and 3 is one in which the vapor of the alcohol or whatever other burning fluid may be employed, is mixed with air before it reaches the working point. It comprises a reservoir *a*, which is preferably spherical and has communicating therewith and extended therefrom an outer tube *b* which, having a suitable insulating covering *c*, forms the handle of the instrument, and has secured at its outer extremity the working point *d* to be described. The outer end of the tube *b* is closed by a suitable plug *e* which is perforated centrally, as at *e'*, for the passage of the mixture of vapor and air, and is screw threaded to receive a cap *f* which carries the working point and is also perforated axially, as at *f'*, for the passage of the mixture of air and vapor. In the end of the cap *f* is secured a tube *g* which conducts the mixture to the extremity of the shell *h* and supports, within the extremity of the shell *h*, a coil *g'* of platinum wire, as usual. The end of the cap *f* is chambered to receive the inner end

of the shell *h* and the shell is secured by slightly crimping the reduced end of the cap *f* upon the shell, a ring or collar *h'* being slipped within the shell to support the inner end of the shell during the crimping of the extremity of the cap. The cap is also chambered, as at *f*², around the reduced central portion *f*³, to receive the wicking *f*⁴ for convenience in effecting the preliminary heating of the point in order to establish combustion within the shell, as hereinafter described, and may supply fluid from the interior of the tube *b* through a duct *e*² in the plug *e* which registers with a duct *f*⁵ in the cap *f* when the cap is rotated to place the duct *f*⁵ in line with the duct *e*². A slight turn of the cap *f* in either direction serves to shut off the supply of fluid to the wicking when the desired result has been accomplished. The tube *b*, aside from its function as a handle, serves to conduct the burning fluid from the reservoir into such proximity to the working point that the fluid will be vaporized by the heat, the vapor returning to the reservoir where it is mixed with air and thence conducted to and burned within the shell *h*, from which the products of combustion escape through the exhaust *h*² provided therefor. For the purpose of thus conducting vapor or the mixture of air and vapor to the point there is provided an inner tube *i*, which, in the construction clearly shown in Figs. 2 and 3, is extended diametrically through the reservoir *a*. Through a suitable swiveled connection *k* air is supplied to the reservoir from any suitable source, such as suitable bulbs *l*, the air escaping from the tube *i* through an opening *i'* into the reservoir, in which it circulates and mixes with the vapor from the alcohol or other fluid contained therein. The tube *i* is completely closed at the center of the reservoir, as at *i*², and on the opposite side of the closure has an opening *i*³ through which the mixture of vapor enters the tube *i* and is conducted to the point. Both of the openings *i'* and *i*³ are formed as close as is practicable to the center of the reservoir so that, the reservoir being never quite half full, neither opening can ever be covered by the liquor no matter in what position the tool may be held. For the further purpose of guarding against the entry of any liquid into the inner tube *i*, even when the instrument is held in a vertical position with the point upward, a guard *m* is secured around

the tube *i* near the end of the outer tube *b*, so that any liquid which may run down on the outer surface of the tube *i* when the instrument is held with the point upward will not reach the inlet *i*³.

It will now be understood that in the use of the instrument illustrated in Figs. 1, 2 and 3, the cap *f* is first turned so as to permit the burning fluid to saturate the wicking *f*⁴. The fluid being then ignited on the wicking, the shell, cap and plug are heated to a degree at which the liquid will be vaporized and the cap is then turned to shut off the further supply of liquid to the wicking. The instrument being held with the tube below the level of the reservoir, the liquid which runs down in the outer tube *b* is vaporized at the extremity of the tube and the vapor passes back into the reservoir *a* where it is thoroughly mixed with the air which enters through the air inlet *i*'. This mixture of air and vapor enters the tube *i* through the inlet *i*³ and passes to the point where it burns within the shell, heating the point to incandescence while the products of combustion pass out through the exhaust opening *h*².

The modified form of the instrument shown in Fig. 4 is not adapted to have air mixed with the vapor in the reservoir *a*, but is adapted to conduct the unmixed vapor to the point *d'*, from which it passes into the atmosphere through the holes *d*² provided for the purpose and is burned outside of the shell or point *d'*. The point or shell forms a continuation of the inner tube *i*⁴, being secured at the end thereof by a suitable coupling *i*⁵, and at its inner end has, at the center of the reservoir *a*, a vapor inlet *i*⁶. The outer tube *b* is secured to the reservoir and, as before, serves not only as the handle of the instrument, being provided with a suitable insulating covering *c*, but serves to conduct the liquid into proximity to the point so that the liquid shall be vaporized. The vapor thus formed passes back into the reservoir *a* and thence into the tube *i*⁴ by which it is conducted to the burner tip and is burned outside thereof as already described.

Various other modifications will suggest themselves and it is to be understood that the invention is not limited to the details of construction shown and described herein.

I claim as my invention:

1. In a thermocauter, the combination of
55 a reservoir for the burning fluid, a tube adapted to support the burning point and connected with the reservoir at a point which is normally below the fluid level when the thermocauter is in use to conduct the
60 burning fluid from the reservoir into proximity to the working point to be vaporized thereby and to return the vapor to the reservoir, and a second tube connected with the reservoir independently of the first tube and
65 at a point which is normally above the fluid

level when the thermocauter is in use to conduct the vapor from the reservoir to the working point.

2. In a thermocauter, the combination of a reservoir for the burning fluid, an outer tube adapted to support the working point and connected with the reservoir at a point which is normally below the fluid level when the thermocauter is in use to conduct the burning fluid into proximity to the working point to be vaporized by the heat thereof and to return the vapor to the reservoir, and a second tube within the first tube and connected with the reservoir independently of the first tube and at a point which is normally above the fluid level when the thermocauter is in use to conduct the vapor from the reservoir to the working point.

3. In a thermocauter, the combination of a reservoir for the burning fluid, an outer tube adapted to support the working point and connected with the reservoir at a point which is normally below the fluid level when the thermocauter is in use to conduct the burning fluid into proximity to the working point to be vaporized by the heat thereof and to return the vapor to the reservoir, and a second tube within the first tube and connected with the reservoir independently of the first tube at a point which is normally above the fluid level when the thermocauter is in use to conduct the vapor from the reservoir to the working point, the last named tube having an inlet for the vapor located substantially in the center of the reservoir.

4. In a thermocauter, the combination of a reservoir for the burning fluid, a tube adapted to support the working point and to conduct the burning fluid into proximity to the working point to be vaporized by the heat thereof and to return the same to the reservoir, a second tube extended substantially diametrically through the reservoir, and adapted to conduct the vapor to the working point, said tube being closed at substantially the center of the reservoir and having an inlet for the vapor on one side of the closure substantially at the center and an outlet for air on the other side of the closure substantially at the center of the reservoir and a connection for an air supply to said tube.

5. In a thermocauter, the combination of a reservoir for the burning fluid, an outer tube adapted to support the working point and to conduct the working fluid into proximity to the working point to be vaporized and to return the vapor to the reservoir, an inner tube to conduct the vapor from the reservoir to the working point and having an inlet substantially central with respect to the reservoir, and a guard surrounding the inner tube to prevent the flow of the fluid to the inlet of the inner tube when the thermocauter is held with the point elevated.

6. In a thermocauter, the combination of
a reservoir for the burning fluid, a tube
adapted to support the working point and
connected with the reservoir at a point which
5 is normally below the fluid level when the
thermocauter is in use to conduct the burn-
ing fluid from the reservoir into proximity
to the point and to return the vapor to the
reservoir, a second tube connected with the
10 reservoir independently of the first tube at a
point which is normally above the fluid level
when the thermocauter is in use to conduct
the vapor from the reservoir to the point,
and means to supply burning fluid from the
15 first named tube to the working point out-
side of the same for the purpose of giving
the initial heat.

7. In a thermocauter, the combination of

a reservoir, a tube extended therefrom, a
plug in the end of the tube having an eccen- 20
tric duct, a cap mounted on the plug and
having a duct adapted to be alined with
the first named duct, a wick chamber com-
municating with the last named duct, and a
burner point supported by the cap. 25

8. A burner point for a thermocauter com-
prising a shell, a cap chambered to receive
the shell, and a ring within the inner end of
the shell, the outer end of the cap being
crimped upon the shell about the ring. 30

This specification signed and witnessed
this 12th day of July, A. D., 1909.

JOHN P. MÜLLER.

Signed in the presence of—

ELLA J. KRUGER,
AMBROSE L. O'SHEA.