A. B. CAMPBELL.

ELECTRICALLY HEATED PERFORATOR.

APPLICATION FILED APR. 24, 1920.

1,361,442. Patented Dec. 7, 1920.

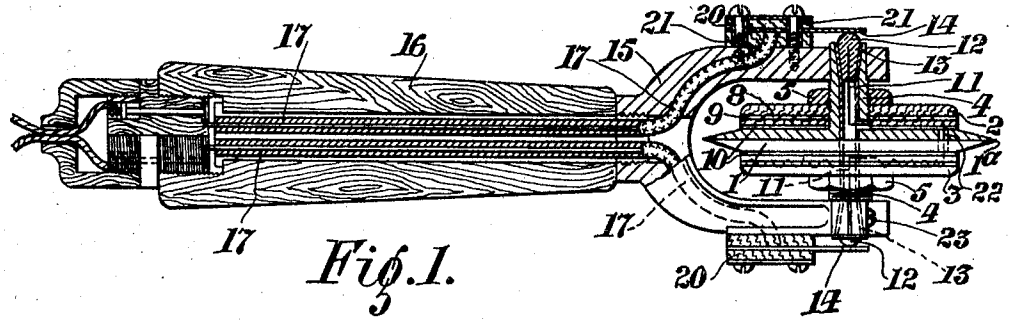


Fig. 1.

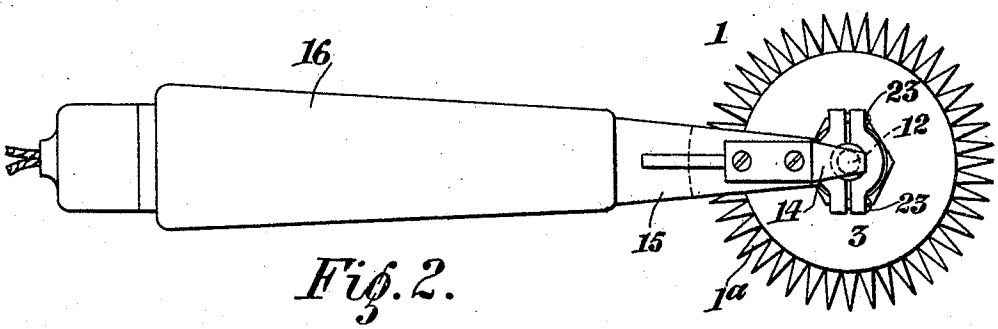


Fig. 2.

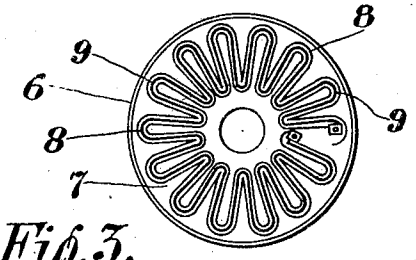


Fig. 3.

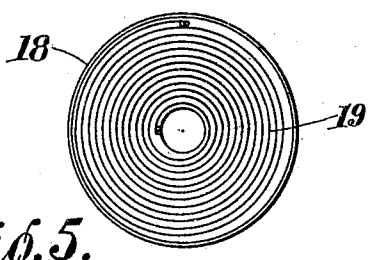


Fig. 5.

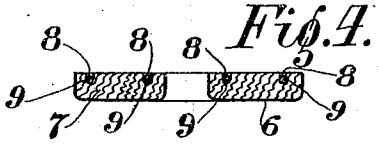


Fig. 4.

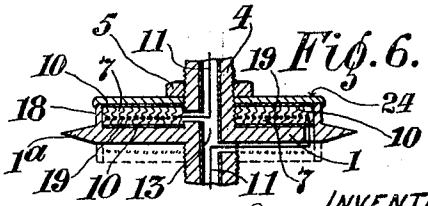


Fig. 6.

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UNITED STATES PATENT OFFICE.

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ELECTRICALLY-HEATED PERFORATOR.

1,361,442. Specification of Letters Patent. Patented Dec. 7, 1920.

Application filed April 24, 1920. Serial No. 376,212.

To all whom it may concern:

Be it known that I, ALEXANDER BLACKWOOD CAMPBELL, 302 Crow road, Glasgow, Scotland, a subject of the King of Great Britain, have invented a certain new and useful Improved Electrically-Heated Perforator, of which the following is a specification.

This invention relates to electrically heated perforators such as are used for perforating cloth and other materials by burning small holes therein.

Under this invention the electrically heated perforator, which has the perforator wheel heated by one or more electric heating elements arranged in conjunction with the wheels and carried on the same axle, is characterized by the axle being hollow and the leads being taken through the axle to contacts carried at the ends thereof and which, during the revolution of the axle, contact with contacts on the handle. The perforator has also other novel features.

I have hereunto annexed explanatory drawings showing, by way of example, a convenient mode of constructing the perforator.

Figure 1 is a sectional view, with part in elevation, of the perforator.

Fig. 2 is a side elevation of the perforator.

Fig. 3 is a plan view and Fig. 4 a cross section of one of the heating devices.

Fig. 5 is a plan view and Fig. 6 a cross section of a modified form of the heating arrangement.

Referring to the drawings whereon the same reference numerals wherever repeated indicate the same parts—

The metallic perforating wheel 1, shown in half section and half elevation in Fig. 1, is located between two heating devices 2, 3, which are simply slid into position on the axle 4 of the wheel and are held in place by nuts 5. Each heating device, as shown at Figs. 3 and 4, may comprise a metallic casing 6 constituting a tray which is filled with asbestos cement 7 in a plastic condition and, while plastic, a properly shaped former is placed in the cement so as to form the sinuous groove 8 therein for the reception of the heating element 9 which would also be of sinuous formation with loops radiating outward from the center toward the circumference as indicated at Fig. 3. Suitable terminals are provided, in known manner, in connection with the element. Each element is insulated from the perforating wheel by means of a mica or other suitable insulating washer 10. The leads 11 for the heating elements are conducted through the center of the hollow axle 4 the one to the one end as shown in section, Fig. 1, and the other (shown dotted in Fig. 1) to the other end of the axle both being fitted in, or to, contacts 12 preferably of tapered formation and which are each simply inserted in place within a mica insulator 13 fitted in the hollow axle. The contacts, which are rounded at their outer ends, as shown at Fig. 1, contact with contact springs 14 secured to and suitably insulated by insulating material 20 and mica sleeves 21 from the jaw 15 and handle 16 of the device. The wire connections 17 for the supply of electrical energy to the heating elements may be led through the handle and connected up with a source of electricity supply in any suitable well known manner. 22 is a wire connection between the two elements. The electricity passes from one contact 14 and one lead 11 to one element and then by the connection 22 to the other element, return lead 11, and other contact 14.

In the modification shown at Figs. 5 and 6 the heating device is made as a part of the wheel 1 and may be only at one side thereof. The wheel, in this case, is made with a hollow part at the one side with a circumferential wall 18 in which is asbestos cement 7, a spiral or other heating element 19 being laid in place in the cement and then the hollow is filled up with asbestos cement as shown at Fig. 6. 24 is a cover plate and 10, mica washers. The axle 4 of the wheel is hollow as before and has the lead 11 to the element 19 passing therethrough, the return lead 11 passing through the wheel and then to and through the hollow axle as before.

There may, of course, as indicated in dotted lines, Fig. 6, be two elements fitted in this way, one at each side of the wheel and be connected up in a manner similar to that at Fig. 1.

It will be seen, Figs. 1 and 2, the heating elements are arranged at each side of the perforating wheel and transmit the heat thereto so that all the points are uniformly heated. The heating devices revolve with the wheel and its axle.

It is obvious the parts can be readily taken apart as the axle and wheel can be

withdrawn by unscrewing the screws 23 and then the nuts 5 unscrewed so as to enable the heating devices to be withdrawn and the heating elements removed and replaced.

The single element arrangement is somewhat cheaper but is not quite so efficient as the double element.

Having now fully described my invention what I claim and desire to secure by Letters Patent is:—

1. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle and electric heating means arranged in conjunction with said wheel and having its leads conducted through said hollow axle.

2. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle, rubbing contacts at the ends of the hollow axle, and an electric heating device in conjunction with said wheel and having its leads passing through the hollow axle to said rubbing contacts.

3. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle, electric heating devices mounted axially on said wheel with leads conducted through its hollow axle, and means for detachably securing said heating devices to said wheel.

4. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle, rubbing contacts on the ends of the hollow axle, electric heating devices mounted axially on said wheel with leads conducted through its hollow axle, and means for detachably securing the heating devices to said wheel.

5. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle and an electric heating device mounted axially on said wheel, said device comprising a heating element embedded in a foundation of non-conducting material and having leads taken through the hollow axle of said wheel.

6. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle, rubbing contacts on the ends of the hollow axle, and a heating device mounted axially on said wheel, said device comprising a heating element embedded in a foundation of non-conducting material with leads taken through the hollow axle of said wheel to said rubbing contacts at the ends thereof.

7. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle and an electric heating device mounted axially on said wheel, said device comprising a tray and a heating element embedded in non-conducting material therein with leads taken through the hollow axle of said wheel.

8. In an electrically heated perforator, the combination of a perforating wheel having a hollow axle, rubbing contacts at the ends of the hollow axle, and a heating device mounted axially on said wheel, said device comprising a tray and a heating element embedded in non-conducting material in the tray with leads taken through the hollow axle of said wheel to said rubbing contacts at the ends thereof.

9. For use in an electrically heated perforator a heating device consisting of a dish-shaped receptacle and a heating element in the form of a flat coil having its convolutions embedded and separated from one another in non-conducting material in the receptacle.

10. For use in an electrically heated perforator a heating device comprising a flat circular receptacle, asbestos cement filled into the receptacle in plastic condition and formed, while plastic, with a groove and a heating element in the form of a flattened coil located in said groove.

11. An electrically heated perforator comprising, in combination, a handle member, electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, and electric heating means arranged in conjunction with the perforating wheel with leads conducted through the hollow axle of said wheel to establish electrical connection with the contacts on said handle member.

12. An electrically heated perforator comprising, in combination, a handle member, resilient electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, rubbing contacts at the ends of the hollow axle co-acting with the resilient contacts on said handle member, and electric heating means arranged in conjunction with said wheel with leads taken through the hollow axle of said wheel to the rubbing contacts at the ends thereof.

13. An electrically heated perforator comprising, in combination, a handle member, resilient electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, and electrical heating elements arranged in conjunction with the wheel but insulated therefrom with leads conducted through the hollow axle to establish electrical connection with the contacts on said handle member.

14. An electrically heated perforator comprising a handle member, resilient electric contacts on said member, a perforating wheel having a hollow axle rotatably carried by said handle member, rubbing contacts at the ends of the hollow axle of said wheel co-acting with the contacts on said handle member, and electrical heating elements arranged in conjunction with the

wheel but insulated therefrom with leads taken through the hollow axle to the rubbing contacts at the ends thereof.

15. An electrically heated perforator comprising, in combination, a handle member, resilient electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, two electric heating devices one at each side of the wheel, leads conducted from the devices through the hollow axle to tapered contacts fitted in the hollow axle and making rubbing contact with the said resilient contacts of the handle.

16. An electrically heated perforator comprising, in combination a handle member, resilient electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, rubbing contacts at the ends of the hollow axle of said wheel co-acting with the contacts on said handle member, electric heating devices mounted co-axially on the wheel with leads taken through the hollow axle to the rubbing contacts at the ends thereof, and means for detachably securing the heating devices to the wheel.

17. An electrically heated perforator comprising, in combination, a handle member, resilient electric contacts on said handle member, a perforating wheel having a hollow axle rotatably carried by said handle member, two electric heating devices one at each side of the wheel, leads conducted from the devices through the hollow axle to tapered contacts fitted in the hollow axle and making rubbing contact with the said resilient contacts of the handle and means insulating said rubbing contacts from the axle.

In testimony whereof I affix my signature in presence of two witnesses.

A. BLACKWOOD CAMPBELL.

Witnesses:
WM. WALLACE,
MARY GREEN.