(No Model.) 2 Sheets—Sheet 1.

F. H. SODEN.

ELECTRO-THERAPEUTIC HEATING PAD.

No. 473,133. Patented Apr. 19, 1892.

Fig. 1

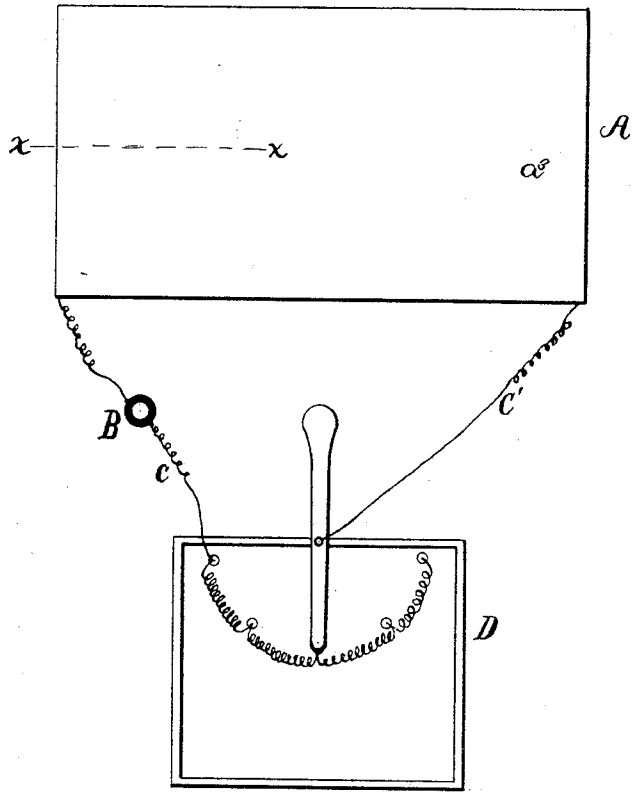
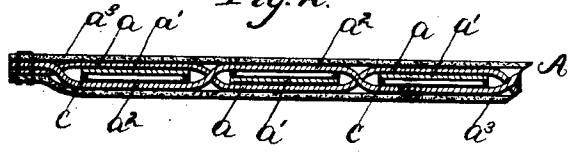


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2

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Fig. 3.

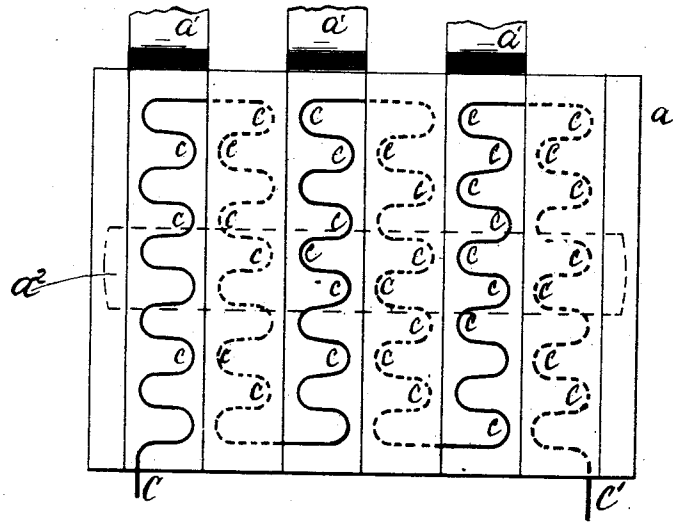


Fig. 4.

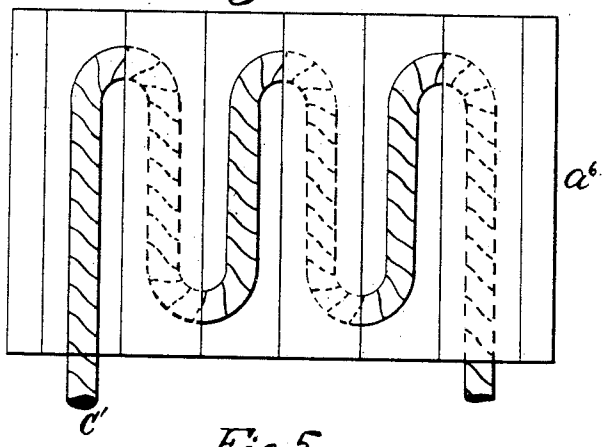
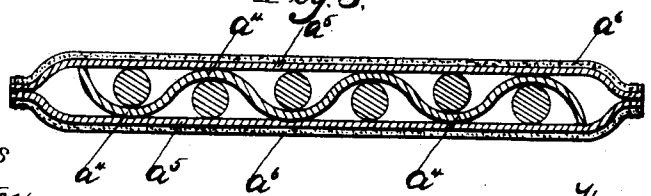


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS H. SODEN, OF CHICAGO, ILLINOIS.

ELECTRO-THERAPEUTIC HEATING-PAD.

SPECIFICATION forming part of Letters Patent No. 473,133, dated April 19, 1892.

Application filed September 1, 1891. Serial No. 404,480. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. SODEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Therapeutic Heating-Pads, of which the following is a specification.

In carrying out my invention I provide a "therapeutic electric heating pad or plaster" (as I propose terming it) by arranging a suitable length of heating-conductor between or within a sheet of some suitable flexible non-conducting material which will not burn by contact with the heating-conductor when a current of electricity is passed through the latter, a sheet or sheets of asbestus being highly serviceable for the purpose aforesaid. The current of electricity can be derived from any suitable source of supply, and in connection with a circuit-wire for supplying the heating-conductor I employ any suitable construction of adjustable resistance, so as to regulate the current and thereby govern the heat which is to be supplied by the heating-pad to the patient. The sheet or sheets of asbestus or other like material can, if desired, be covered with any suitable material, such as flannel or other suitable cloth, and since the heating-pad is flexible it will readily conform to the body of the user.

In the accompanying drawings, Figure 1 represents the heating-pad in circuit with a battery and adjustable resistance. Fig. 2 represents a section through a portion of Fig. 1 on line x x on a somewhat larger scale. Fig. 3 represents the heating-pad, with certain covering-strips thrown back so as to expose the heating-conductor. Fig. 4 illustrates the inner portion of the heating-pad, with the heating-conductor wound about a rope or cord of non-conducting material. Fig. 5 illustrates a section through the heating-pad involving a variation in details of construction.

In Fig. 1, A indicates the electric heating-pad, which is in circuit with a battery B through the medium of conductors C and C′, and D denotes an adjustable resistance for regulating the current.

In Figs. 2 and 3 the heating-pad A comprises a sheet a of asbestus, which is bent so as to provide it with a series of channels or depressions alternately arranged at opposite sides of the sheet and adapted to receive the heating-conductor, which is bent to form a series of reverse curves c along such channels or depressions. The wire is carried along one channel at one side of the sheet and then carried through the sheet to the next depression at the opposite side of the sheet and then brought back along said second depression, and so on, by which arrangement I attain a suitable length of heating-conductor within the heating-pad. The heating-conductor thus arranged within the grooves or depressions is covered by strips a' of asbestus, which can be secured at their ends to the sheet a in any suitable way, and as a means for holding the strips a' at points between their ends I provide a tongue a^2, consisting of a strip of asbestus, which is carried through the sheet a at points between the grooves or depressions in the latter, as illustrated in Fig. 2, it being also observed that said tongue is indicated in dotted lines in Fig. 3. The foregoing construction is then provided with any suitable covering—for example, with sheets a^3 of flannel or other suitable cloth. By thus arranging the heating-conductor within the heating-pad the latter will preserve its flexibility, and when bent or rolled the heating-conductor along one channel cannot come in contact with the heating-conductor along the next adjacent channel or channels. I do not, however, limit myself to the foregoing construction, since the heating-conductor can be embedded in a flexible sheet of asbestus or other analogous material, which will not burn, in various ways.

As an illustration of another way of constructing the plaster I have shown in Figs. 4 and 5 a corrugated sheet a^4 of asbestus and wrapped the heating-conductor about a cord c', of asbestus or other non-conducting material, which is carried back and forth along the gutters formed by the corrugations, it being observed that the heating-conductor is first carried along a gutter at one side of the sheet and then carried along a gutter at the opposite side of the sheet, and so on. As illustrated in Fig. 5, the sheet a^4 is simply confined between a couple of sheets a^5 of asbestus or analogous material, and the whole then provided with a covering consisting of one or more sheets a^6 of flannel or other suitable

cloth. The heating-pad can of course be made of any desired size and can have its inclosed heating-conductor arranged in any suitable number of rows, and again the heating-conductor can be disposed in any other suitable way, it being apparent that the foregoing description is suggestive of many modifications which could be made without departing from the spirit of my invention.

With regard to the covering of flannel or the like I find the same desirable, since it is not only agreeable to the user, but also prevents the asbestus from rubbing off. As a matter of special construction the employment of the tongue a^2 is also desirable, since it holds the sheets and serves to maintain the asbestus in contact with the heating-conductor. I may of course provide more than one tongue or I may use suitable cords in place of the same.

What I claim as my invention is—

1. A therapeutic electric heating-pad comprising a heating-conductor confined within a flexible sheet or sheets, substantially as and for the purpose described.

2. A therapeutic electric heating-pad comprising a heating-conductor confined within a flexible sheet of asbestus or like material, provided with a suitable covering, substantially as and for the purpose set forth.

3. A therapeutic electric heating-pad comprising a heating-conductor arranged within depressions in a flexible sheet, such as set forth, and a covering for the same, substantially as and for the purpose set forth.

4. A therapeutic electric heating-pad comprising a heating-conductor arranged within the grooves of a sheet a, covering-strips a', and a covering a^3, as set forth.

5. The combination of a therapeutic electric heating-pad, as set forth, and an adjustable resistance in circuit with the source of supply and the heating-conductor in the heating-pad, substantially as and for the purpose described.

6. A therapeutic electric heating-pad comprising a flexible sheet of asbestus, a heating-conductor held against the same, and a tongue for holding the parts together, substantially as described.

FRANCIS H. SODEN.

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