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ELECTRIC MASSAGE APPARATUS

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Fig. 1.

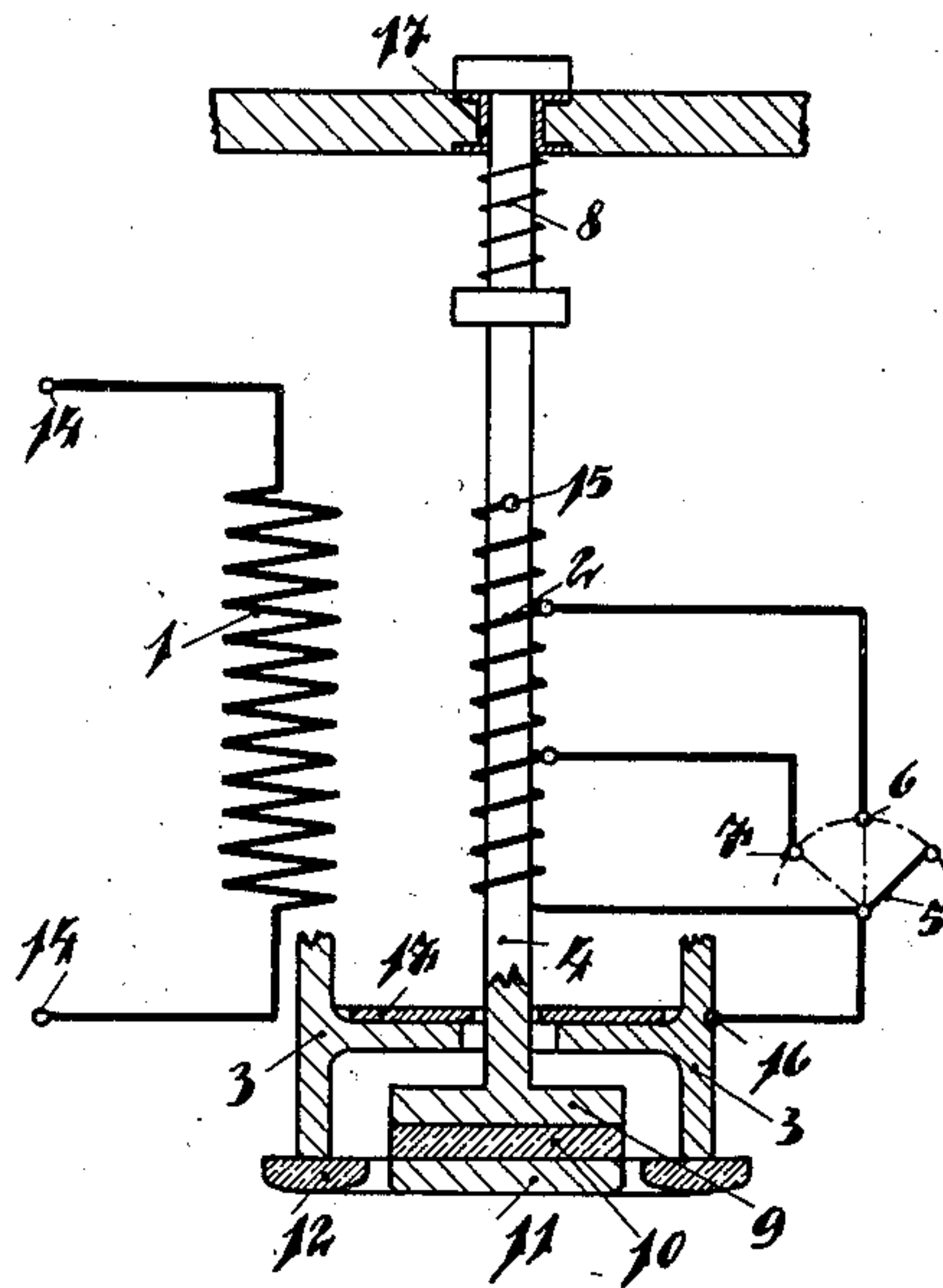


Fig. 2.

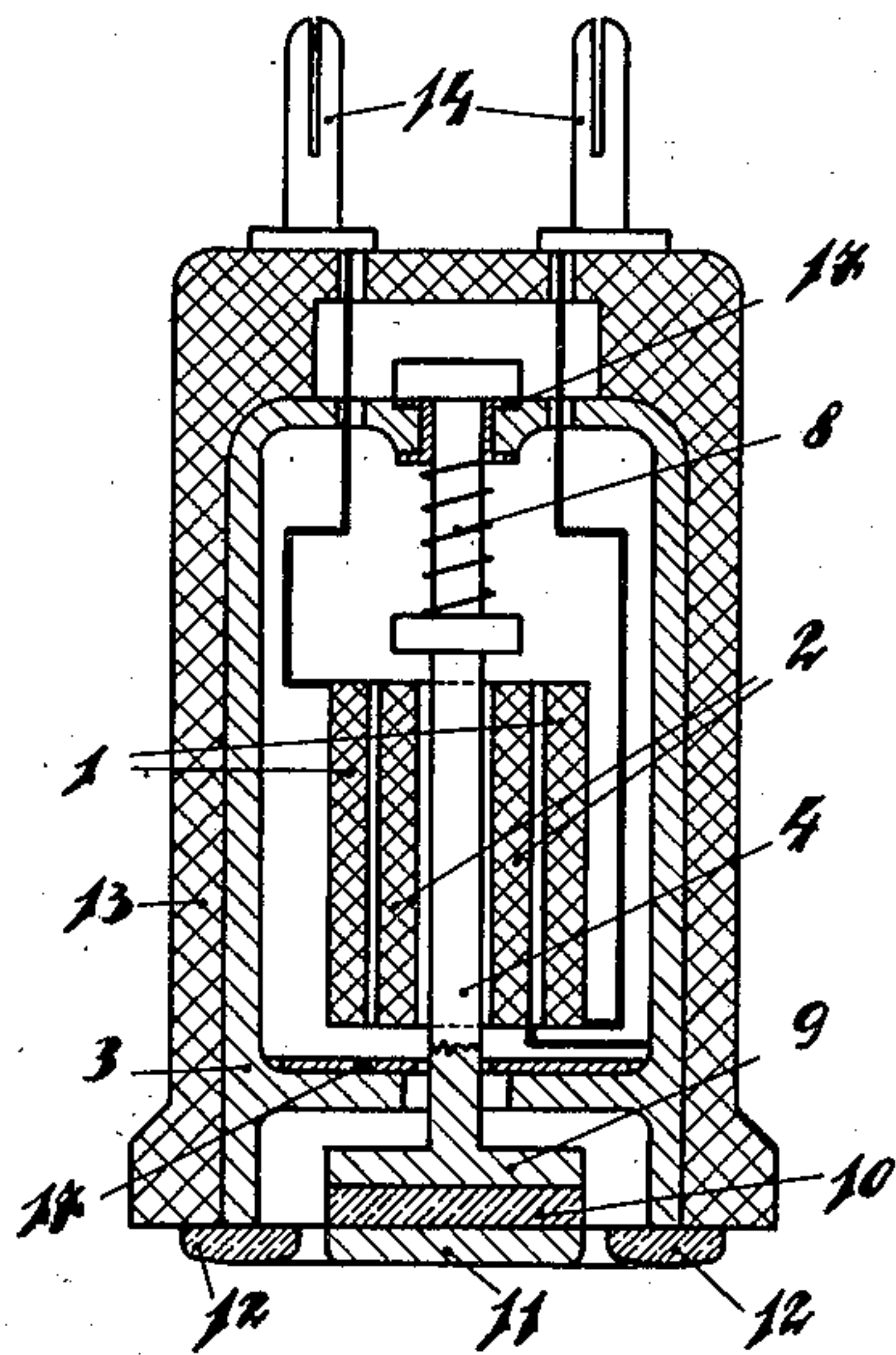
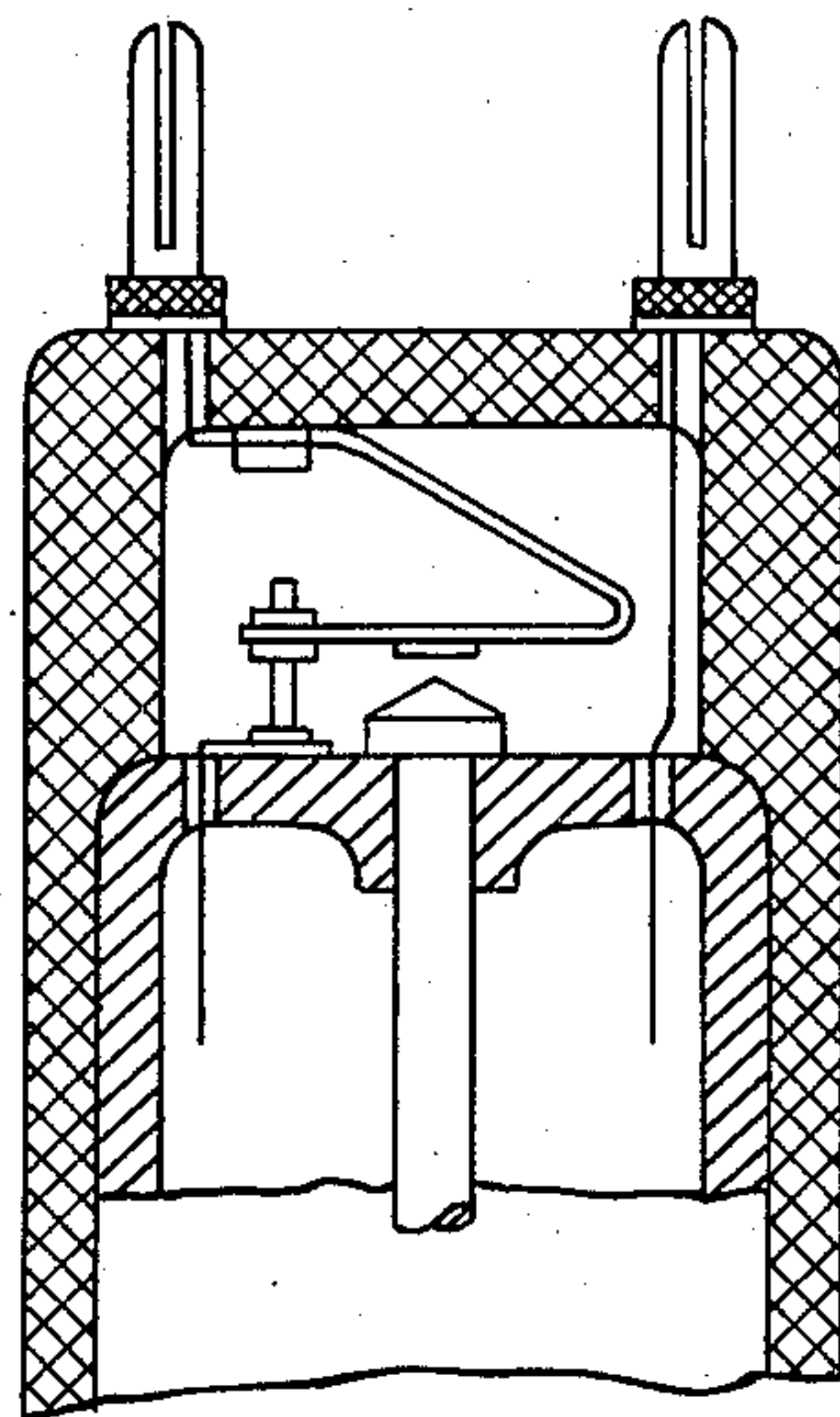


Fig. 3.



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## UNITED STATES PATENT OFFICE

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## ELECTRIC MASSAGE APPARATUS

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5 Claims. (Cl. 174—177)

This invention relates to an electric massage apparatus the vibrating element of which vibrates under the influence of an alternating field produced by an alternating current circulating in a primary coil, the portion of the skin to be treated being penetrated by electric current and receiving heat supplied by the apparatus, characterized in that the secondary circuit producing the alternative field is closed by a fixed portion of the apparatus resting on the portion of the skin to be treated, by this portion of the skin and by the vibrator of the apparatus, the secondary circuit and the alternative current circulating therein being interrupted as soon as the vibrator moves away from the portion of the skin to be treated.

An embodiment of the invention is illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a diagram showing the electric portion of the apparatus.

Fig. 2 is a longitudinal section through the apparatus.

Fig. 3 is a sectional view showing the arrangement of the circuit breaking device.

A primary coil 1 and a secondary coil 2 are mounted on a soft iron core 4 guided in insulated rings 17. One of the extremities of the secondary coil 2 is connected to the core 4 at 15 and the other extremity to a fixed part 3 of the apparatus at 16, this fixed part 3 being a conductor of electricity. The fixed part 3 may also be made of insulating material and in this case the second extremity of the secondary coil 2 is fixed directly to a zinc ring 12 which carries the fixed part 3.

The core 4 carries at its lower end 9 a copper plate 11. Between this plate and the lower portion 9 of the core 4 a plate 10 is arranged having an electric resistance as far as possible equal to that of the copper plate 11. For this reason the plate 10 is preferably made of aluminium. The core 4 and the plates 10 and 11 constitute the vibrator which is pressed constantly in downward direction by a spring 8. It is evident that the strength of the spring, the amplitude of vibration, the maximum and minimum lift of the vibrator and the like can be regulated by means of a regulating screw or the like. A lever 5 and intermediate contacts 6, 7 enable the adjustment of the tension between the plate 11 and the ring 12 and also that of the force of vibration.

When it is desired to use the apparatus the primary coil 1 is connected to a source of alternating current, for example to the lighting supply main by means of a plug contact 14. The appa-

ratus is then placed on the portion of the skin to be treated in such a manner that the skin is in contact with the fixed portion, namely the ring 12 and with the vibrator, that is the plate 11. The alternating current circulating in the secondary coil 2 then travels to the portion of the skin to be treated.

Under the influence of this primary current the vibrator rises and moves away from the portion of the skin to be treated. The derived circuit and the current therein are interrupted, the spring 8 forces the vibrator in downward direction whereby again closing the circuit so that the cycle recommences. The primary and secondary coils are arranged in such a manner that the heat which is produced is absorbed as far as possible by the portion of the skin to be treated; this heat and also the intensive massaging effect produced by the vibrator cause intensive perspiration from the portion of the skin being treated. The perspiration in combination with the copper plate and zinc ring form a battery cell, the pulsating current of which likewise passes through the portion of the skin to be treated with a number of pulsations twice as high as the periodicity of the secondary circuit and current. This pulsated current is likewise interrupted as soon as the vibrator moves away from the portion of the skin to be treated.

It is evidently possible to transpose the copper and zinc to substitute copper for zinc and zinc for copper. In this case an intermediate ring made for example of aluminium is inserted between the fixed part 3 and the copper ring. It is also possible to provide instead and in the position of this ring and this plate constituting the galvanic cell a source of constant current independent of the apparatus itself and electrically connected on the one hand to the vibrator and on the other hand to the fixed part of the apparatus.

It is also possible to connect the primary coil to a source of continuous current. In this instance it is sufficient to interpose in the primary current a circuit breaking device, the movable part of which may be formed by the vibrator itself as shown in Fig. 3.

No matter whether the primary coil is supplied with alternating or continuous current, the arrangement above described considerably increases the frequency of vibration relative to an apparatus in which the circuit is not interrupted when the vibrator moves away from the portion of the skin to be treated.



I claim:—

1. An electric massage apparatus, comprising in combination a fixed part of the apparatus, insulated rings in said fixed part, a soft iron core  
5 guided in said rings acted upon by a primary coil supplied with electric current and by a helicoidal spring forming the vibrating system, a secondary coil surrounding said soft iron core and surrounded by said primary coil, one end of said secondary  
10 coil connected to said core and the other end of said secondary coil connected to said fixed part on the apparatus, said soft iron core brought to vibrate by the combined action of said primary coil and said spring, said vibrator being under  
15 the influence of an alternating field produced by an alternating current inducted in said secondary coil and supplying electric current and heat through the intermediary of said vibrator and the fixed part of the apparatus to the portion of the  
20 skin to be treated, the secondary coil circuit being closed through the fixed part of the apparatus bearing against the body across the portion of the body being treated and the vibrator, said circuit and said alternating current circulating  
25 therein being interrupted when the vibrator moves away from the body.

2. An apparatus as specified in claim 1, in which pulsating current is supplied to the portion of the skin to be treated and which circulates at  
30 the same time as the alternating current from the secondary coil, comprising at least two elements forming a galvanic cell, the circuit of which is closed by the portion of the skin to be treated,

this circuit being interrupted when the soft iron core moves away from the portion of the skin to be treated, the galvanic elements being a ring at the end of the fixed part and the plate at the end of the vibrator, excited by the perspiration  
5 of the portion of the skin to be treated.

3. In an apparatus as specified in claim 1 a galvanic cell composed of a copper plate and a zinc plate, one of said plates rigidly connected to the fixed portion of the apparatus and the  
10 other to the vibrator and of an intermediate plate interposed between said copper plate and said fixed part of the apparatus, the electric resistance of this intermediate plate being substantially equal to that of the copper plate. 15

4. In an apparatus as specified in claim 1 a galvanic cell composed of a copper plate and a zinc plate, one of said plates being rigidly connected to the fixed portion of the apparatus and the other to the vibrator and an intermediate  
20 plate made of aluminium and interposed between said copper plate and said fixed part of the apparatus, the electric resistance of this intermediate plate being substantially equal to that of the copper plate. 25

5. An apparatus as specified in claim 1, comprising a primary and a secondary coil arranged in such a manner that the heat radiated thereby is absorbed chiefly by the portion of the skin to be treated. 30

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