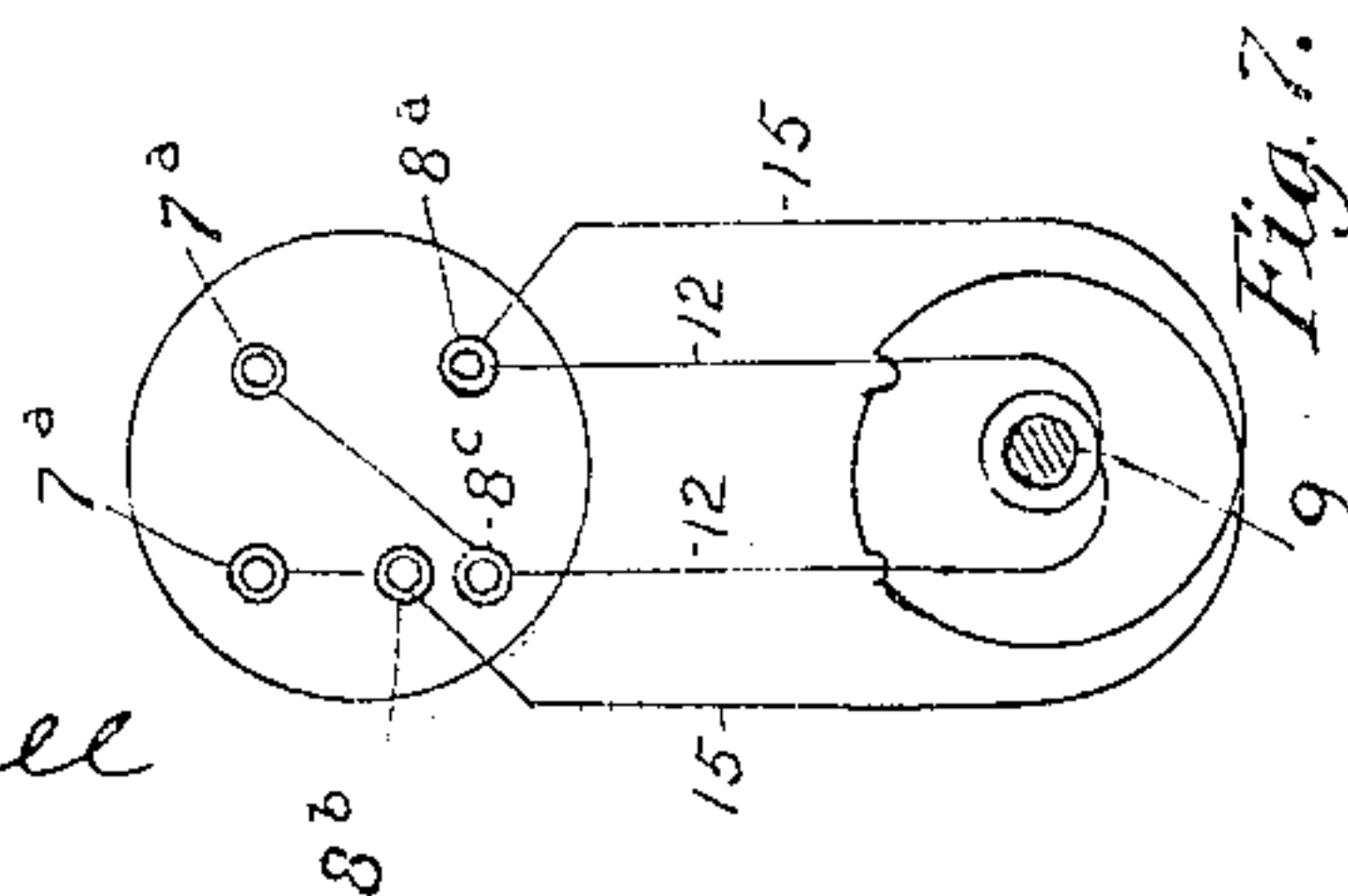
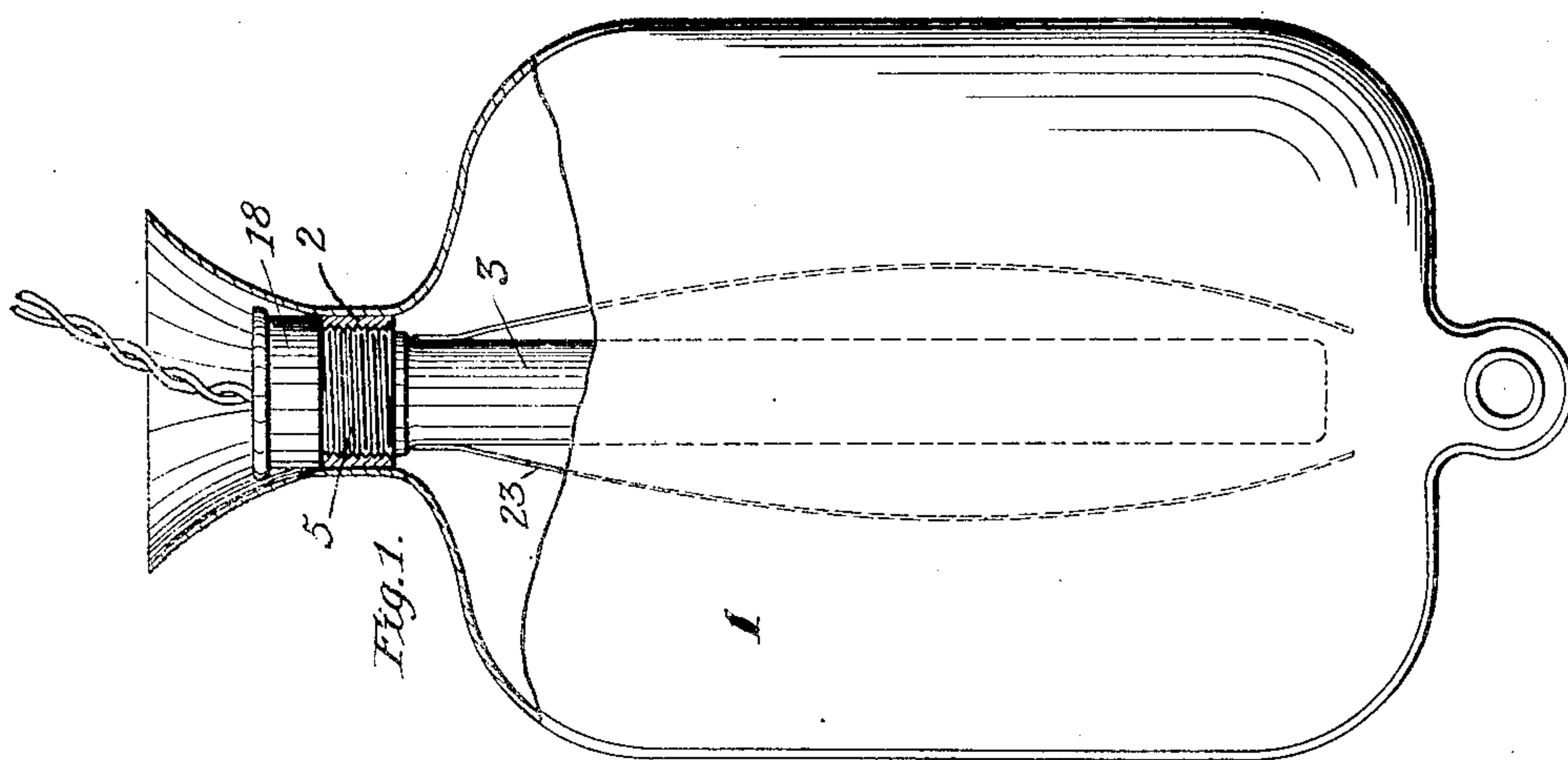
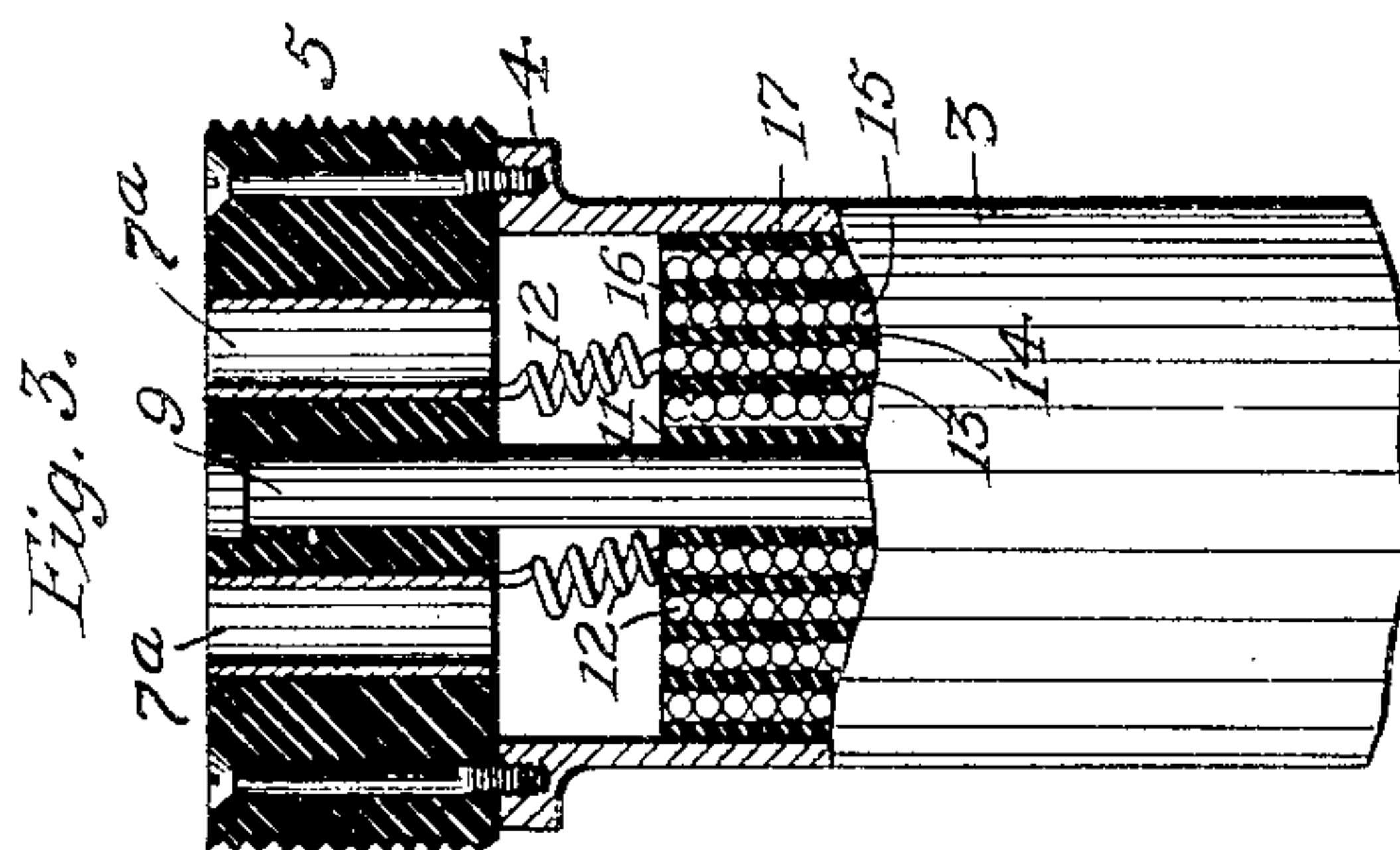
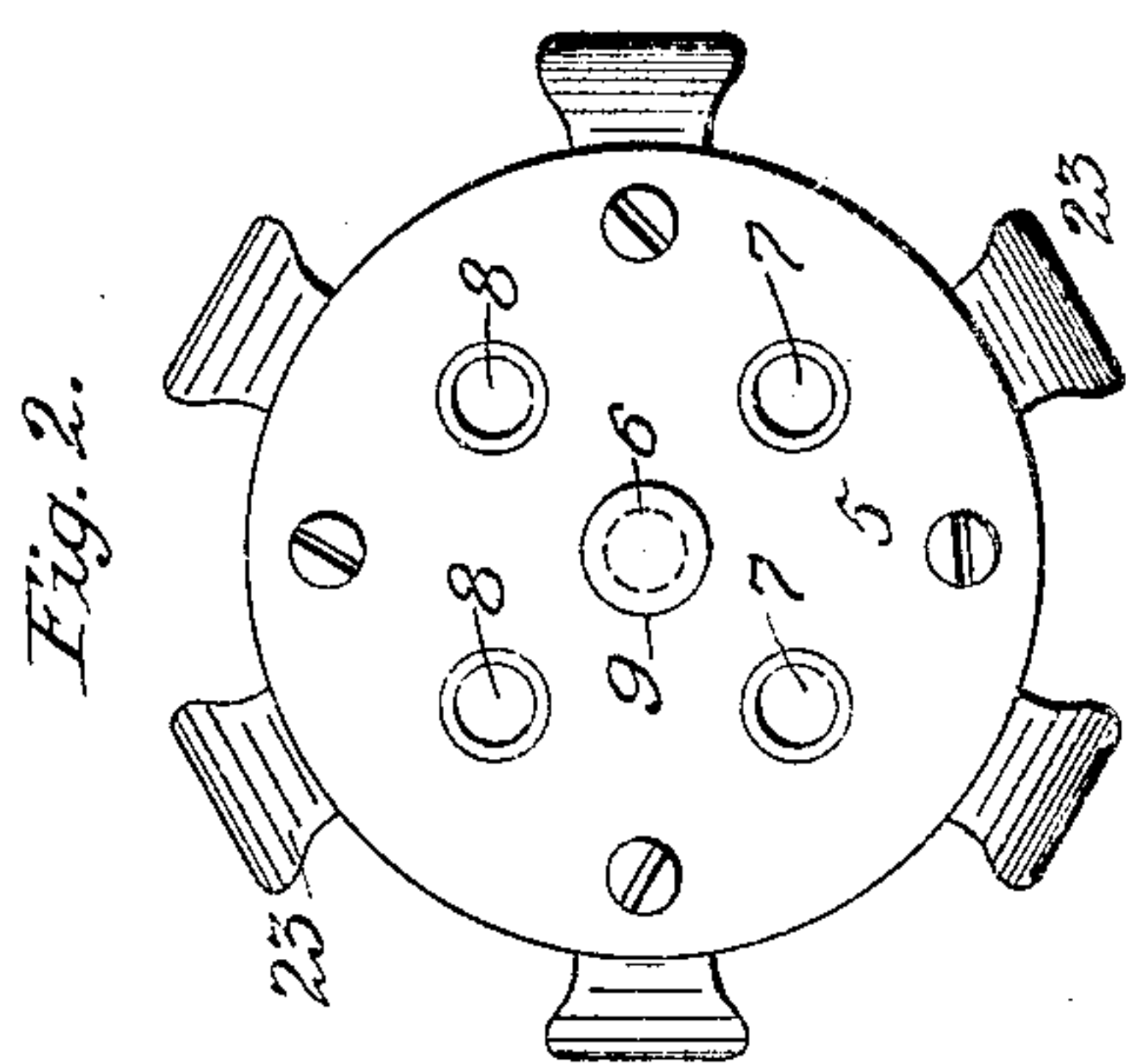
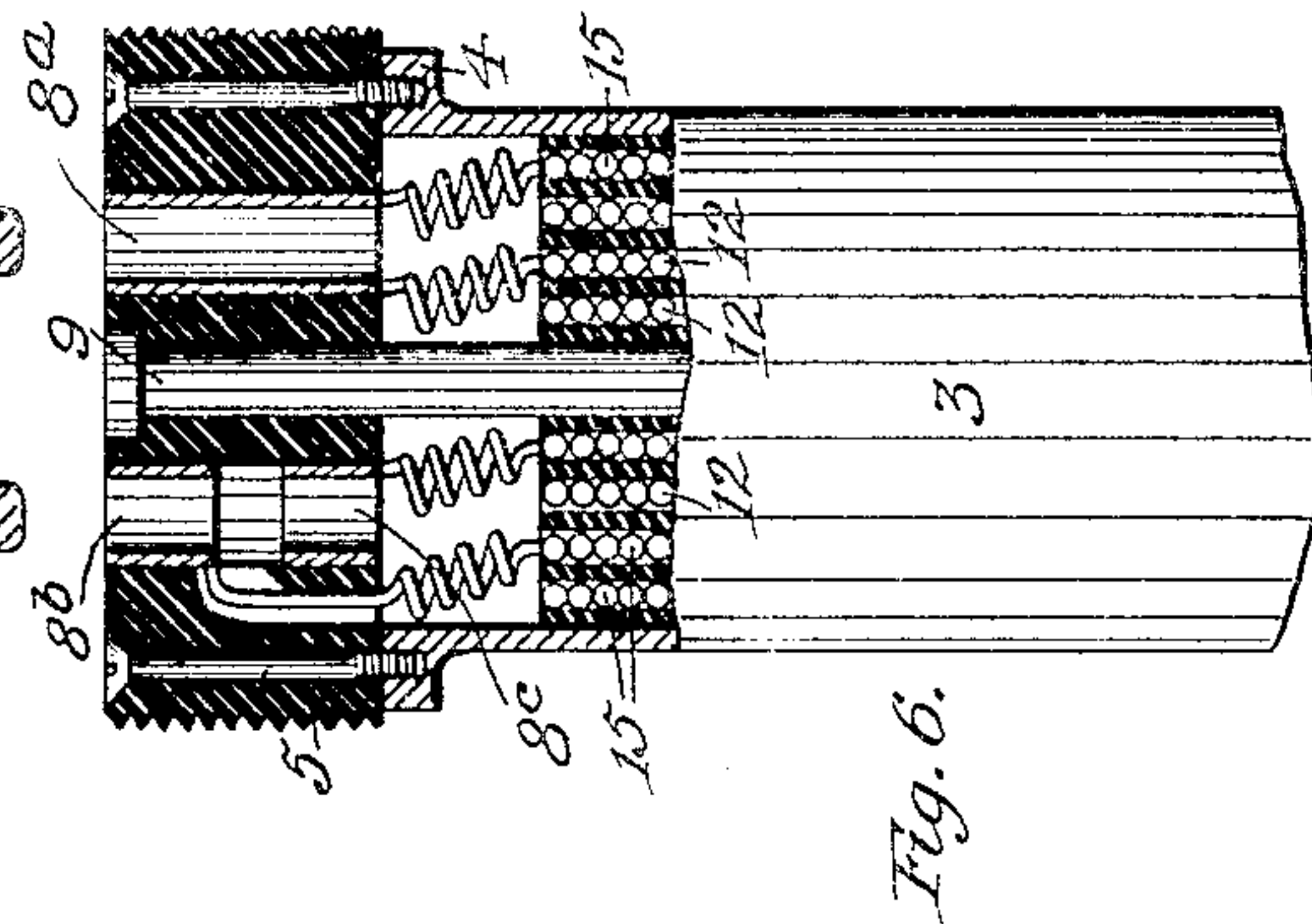
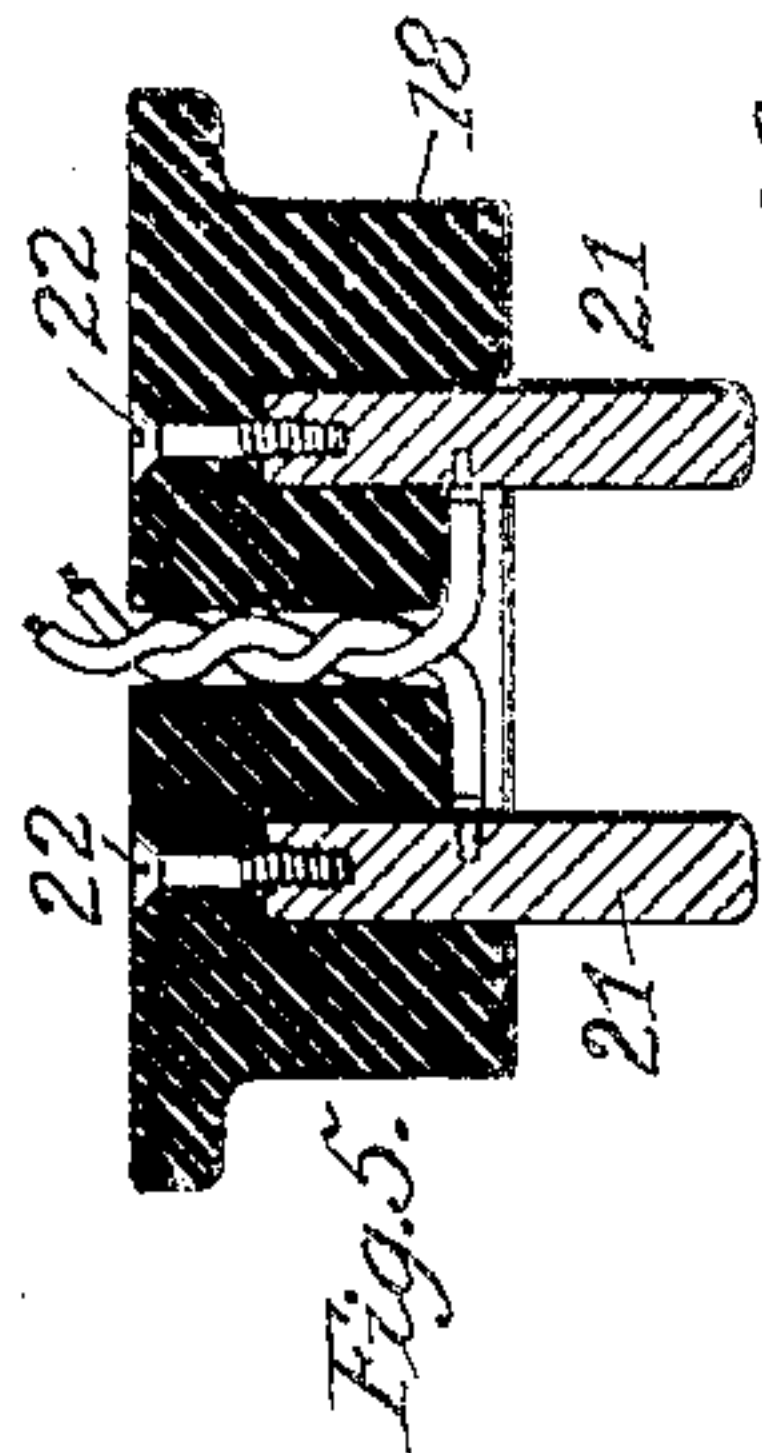
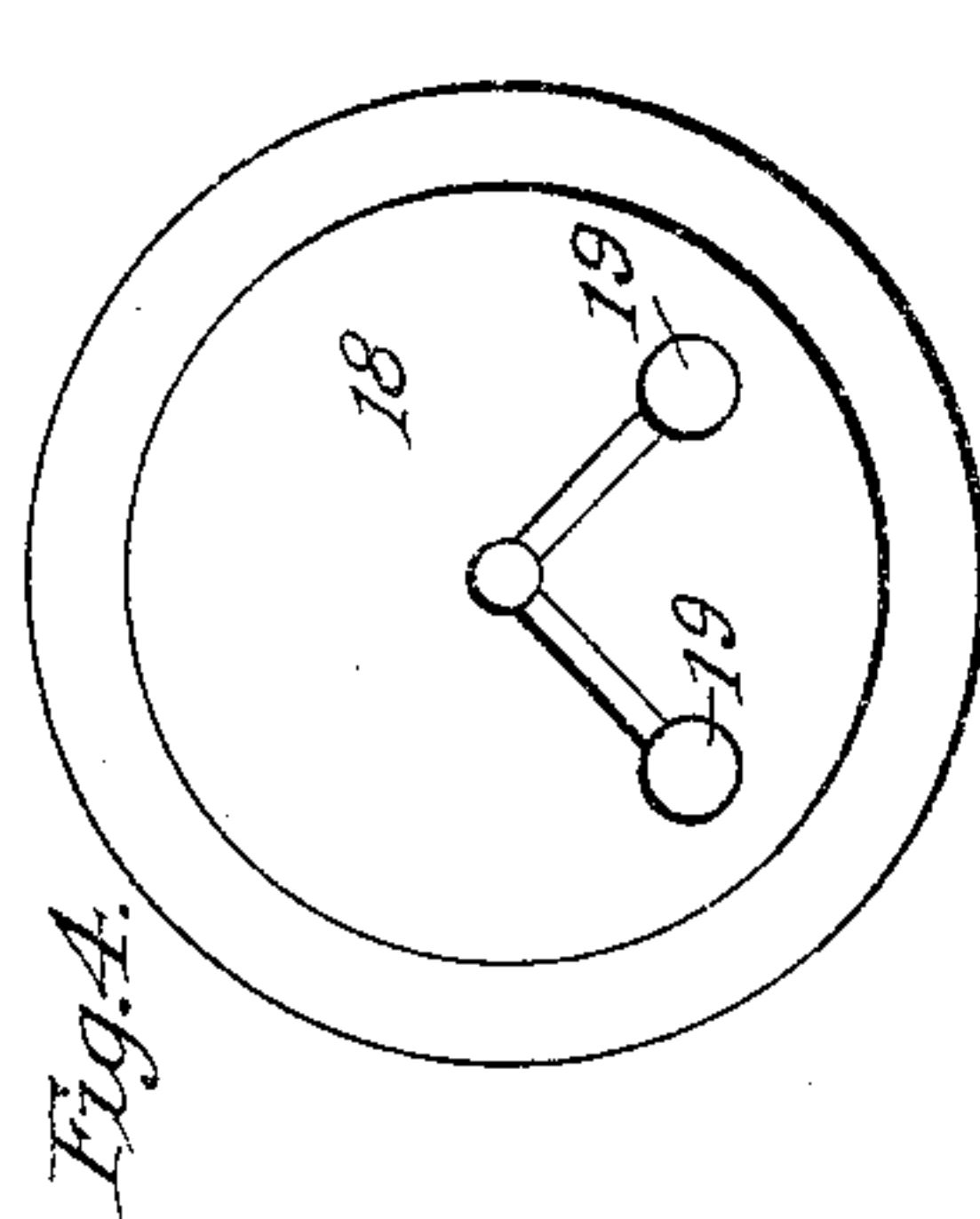


No. 804,759.

PATENTED NOV. 14, 1905.

J. A. NOBLE.
ELECTRICAL HEATER.
APPLICATION FILED MAY 8, 1905.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN ALBERT NOBLE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-FOURTH TO EDGAR C. GRIBBLE, ONE-FOURTH TO ALONZO C. GRIBBLE, AND ONE-FOURTH TO JAMES DAVIS, OF SAN FRANCISCO, CALIFORNIA.

ELECTRICAL HEATER.

No. 804,759.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed May 8, 1905. Serial No. 259,403.

To all whom it may concern:

Be it known that I, JOHN ALBERT NOBLE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Electrical Heaters, of which the following is a specification.

My invention relates to electrical heaters intended more particularly for heating water—as, for example, in hot-water bottles or bags, fountain-syringes, &c. In this connection my invention has special reference both to means for heating the water and to means for keeping it hot without substantially increasing its temperature.

The objects of my invention are to provide means for quickly raising the temperature of water and also means for retaining it in a heated condition.

With special reference to hot-water bottles, my object is to provide a simple electrical heating apparatus which can be easily applied to and removed from an ordinary bottle, such heating apparatus also forming the closure for the bottle.

An embodiment of my invention is shown in the accompanying drawings, in which—

Figure 1 is an elevation of a hot-water bottle, partly broken away, with my water-heater in position. Fig. 2 is a top plan of the heater. Fig. 3 is a vertical section of the upper part of the heater, taken through the holes which permit the connections to be made for high resistance with the windings in series. Fig. 4 is a bottom plan of the reversible insulating-cap which carries the circuit-closing plugs. Fig. 5 is a cross-section of the same. Fig. 6 is a vertical section of the heater, taken through the holes which permit the connections to be made for low resistance with the windings in multiple. Fig. 7 is a diagram of the electrical connections.

The receptacle, bag, or bottle 1 may be made of any desired character, preferably a hollow water-tight structure of rubber. I have shown an ordinary hot-water bottle having a flaring mouth and provided at the neck with a threaded collar 2 to receive the closure and which in this case supports the removable electrical heater, which is both a heater and a closure.

The heater is inclosed by a shell 3, closed at the bottom and having a flange 4 at the top. Resting on this flange and secured to it by

screws is an externally-threaded insulating-block 5, of fiber, porcelain, or other suitable material, having a central vertical passage 6 and four other vertical passages 7 7 and 8 8. Passages 7 7 have metallic linings or bushings 7^a 7^a, and one passage 8 has a similar bushing 8^a, while the other has a sectional or two-part divided bushing 8^b 8^c. In the central opening 6 is a rod 9, having a countersunk head and extending throughout the shell. This rod is inclosed by insulation 11, which may be of mica, asbestos composition, or any suitable material. A wire winding 12 incloses this insulation from top to bottom and is in turn surrounded by insulation 13. Upon the insulation 13 the winding 12 is continued and is coiled upwardly. One of its ends is in electrical connection with one bushing 7^a and also with bushing 8^c. The other terminal is connected to the other bushing 8^a, as shown in Fig. 3. Next to the upward winding of coil 12 is insulation 14. A winding 15 is coiled upon this downwardly, surrounded by insulation 16, and then returned upwardly. Insulation 17 is placed between this upward winding and the shell 3. One end of winding 15 is connected to bushing 8^b, the other end to bushing 8^a.

A reversible circuit-closer is provided consisting of an insulating-cap 18, having sockets 19 in its lower surface. These sockets are set off the center of the cap and contain two conducting-plugs 21, held by screws 22. The supply-conductors enter a perforation in this cap and are connected, respectively, to the plugs 21. The cap is reversible, inasmuch as it can be turned either so that its plugs will enter the passages 7 7 in block 5 or so that they will enter the passages 8 8, and as the plugs are set away from the center the cap will in either case register correctly with the block 5.

The heater is inserted in the bottle and the thread of block 5 screwed into the collar in the bottle-neck. Curved spring-arms 23 are secured by brazing or otherwise to the shell 3, which act as guards to keep the bag from coming into contact with the heater.

When the cap is plugged into the holes 7 7, the coils 12 and 15 are in series, affording a high resistance. This is not intended as a heating-current, but is used for maintaining the heat of water in the bottle, which has been previously heated. Thus hot water might be

poured into the bag and kept hot by the current when the coils 12 and 15 are in series. Ordinarily, however, the water in the bottle is heated by plugging the cap into holes 8 8, 5 which brings the two coils into multiple and establishes a lower resistance, and consequently accomplishes the quick heating of the water.

By using hot-water bottles where it is essential that they be kept hot it is a matter of difficulty as such bags are ordinarily constructed. Hot water must be kept ready, the bag frequently removed, filled, and again replaced, disturbing the patient both in removal and replacement. Of course it is impossible to preserve a uniform temperature with the ordinary bags. My device obviates all these difficulties. The water can be heated to any degree desired and a sufficient degree of heat thereafter maintained for any length of time in the manner heretofore described without disturbing the patient by the removal and replacement of the bottle, the disarrangement and rearrangement of the bed-coverings, &c.

I have indicated no source or supply of electricity, but have shown the conductors, which are supposed to lead some proper connection with such a supply.

I do not limit myself to the precise constructions and arrangements herein described and shown in the accompanying drawings, as I desire to avail myself of such modifications and equivalents as fall properly within the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electrical heater comprising a tube or shell, a wire winding within the same, an insulating-block secured thereto and having passages in electrical communication with said winding and a removable cap, having plugs adapted to fit said passages.

2. In combination with a receptacle having a filling-opening and provided with means for engaging a closure for said opening, a tube or shell, a wire winding therein, an insulating-block provided with corresponding engaging means, and having passages in electrical communication with said winding, and a removable cap having plugs adapted to fit said passages.

3. In combination with a receptacle having a filling-opening and provided with means for engaging a closure for said opening, a tube or shell, a wire winding therein, an insulating-block provided with corresponding engaging means, and having passages in electrical com-

munication with said winding, and a removable cap having plugs adapted to fit said passages.

4. An electrical heating device comprising a shell, separate windings therein forming resistances, a cap connected to a source of electrical energy and having plugs, and means for connecting said plugs with said windings so as to place said windings either in series or in multiple.

5. In combination with a receptacle for water, an electrical heating device comprising a shell, separate windings therein forming resistances, a cap connected to a source of electrical energy and having plugs, and means for connecting said plugs with windings so as to place said windings either in series or in multiple.

6. In combination with a receptacle for water composed of flexible material, an electrical heating device, means for removably securing the same within the receptacle, and guards for preventing contact between the receptacle and said heating device.

7. In combination with a receptacle for water composed of flexible material, an electrical heating device, means for removably securing the same within the receptacle, and arms secured to the heater forming guards preventing contact between the receptacle and said heating device.

8. An electrical heater comprising a shell, separate windings therein forming electrical resistances, a block secured to the tube and having two pairs of hollow bushings in electrical connection with said windings, and a cap having two plugs set away from its center and reversible for connection with either pair of bushings.

9. An electrical heater comprising a shell, an insulated electrical rod extending longitudinally in the same, a winding on said rod, insulation surrounding said winding, a return of said winding on said insulation, insulation surrounding said return-winding, another winding insulated from said return-winding, insulation surrounding said other winding, a return of said other winding, insulation between said return and the shell, a block secured to the shell and having two pairs of hollow bushings and a cap having a pair of plugs adapted to enter either pair of bushings.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 22d day of April, 1905.

JOHN ALBERT NOBLE.

Witnesses:

L. W. SEELY,
CELESTE ANSELL.