

S. E. FLICHTNER.
STARTER AND CIRCUIT FOR VAPOR DEVICES.
APPLICATION FILED JAN. 9, 1905.

956,066.

Patented Apr. 26, 1910.
2 SHEETS—SHEET 1.

Fig. 1

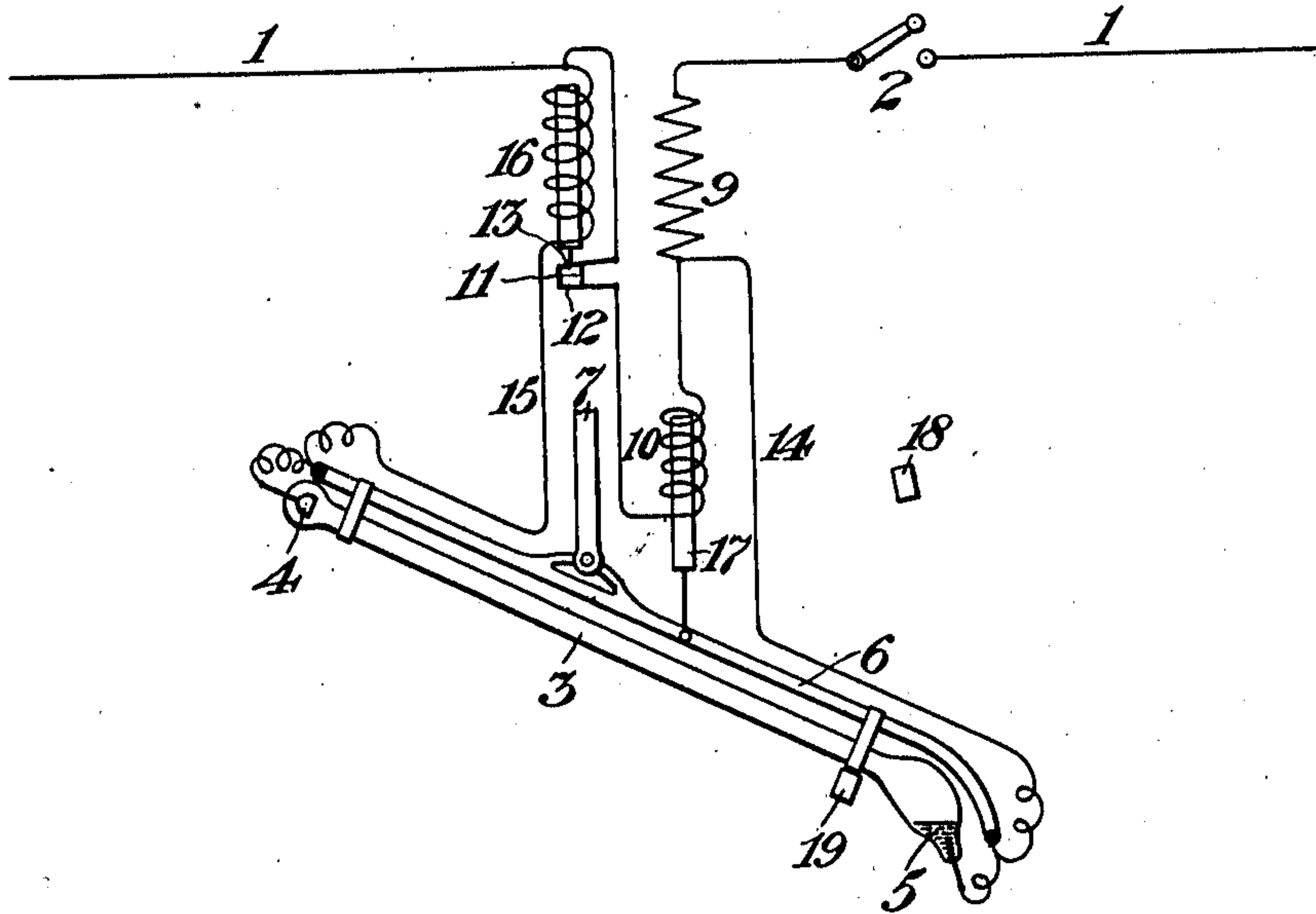
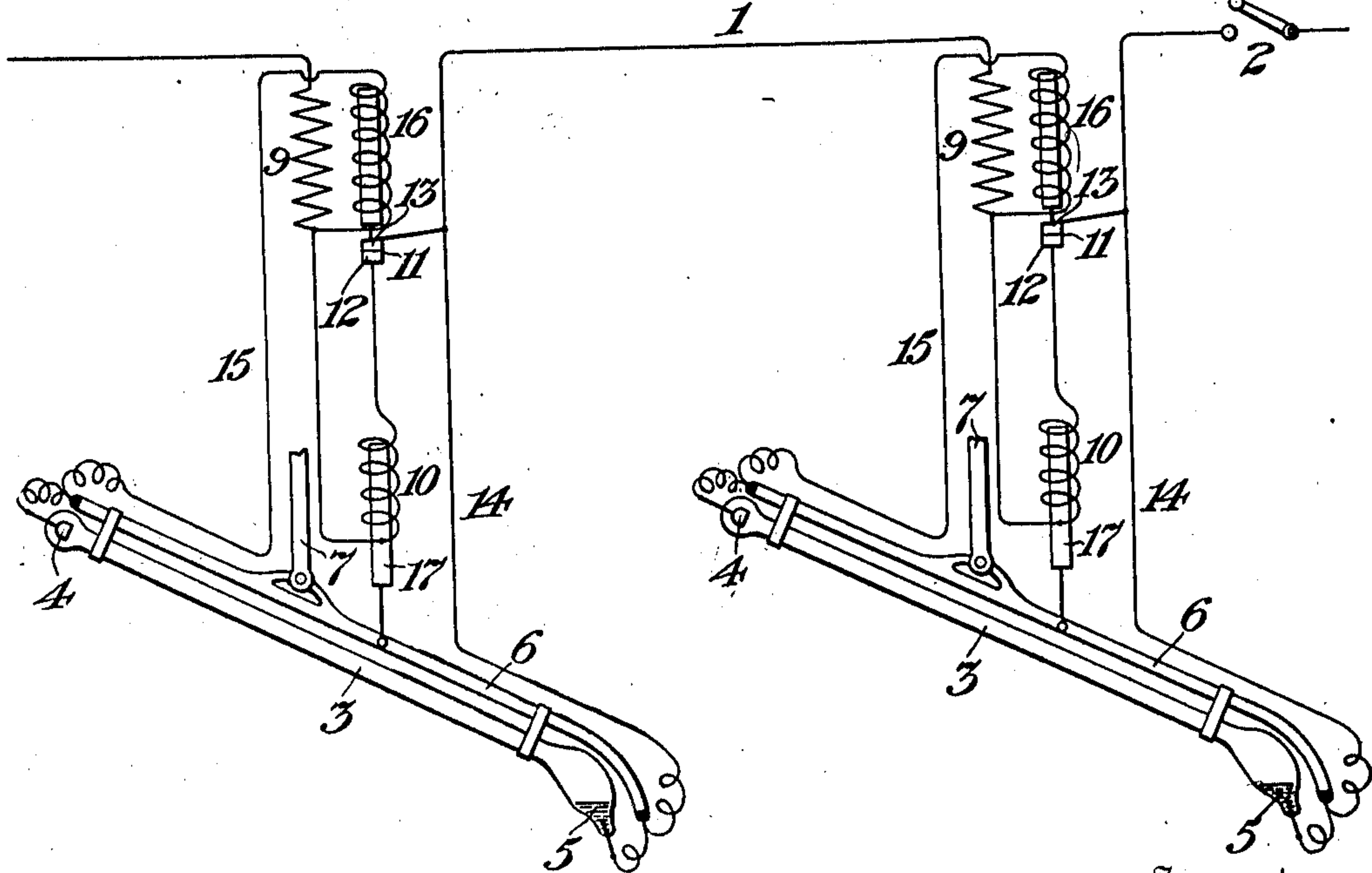


Fig. 2



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STARTER AND CIRCUIT FOR VAPOR DEVICES.

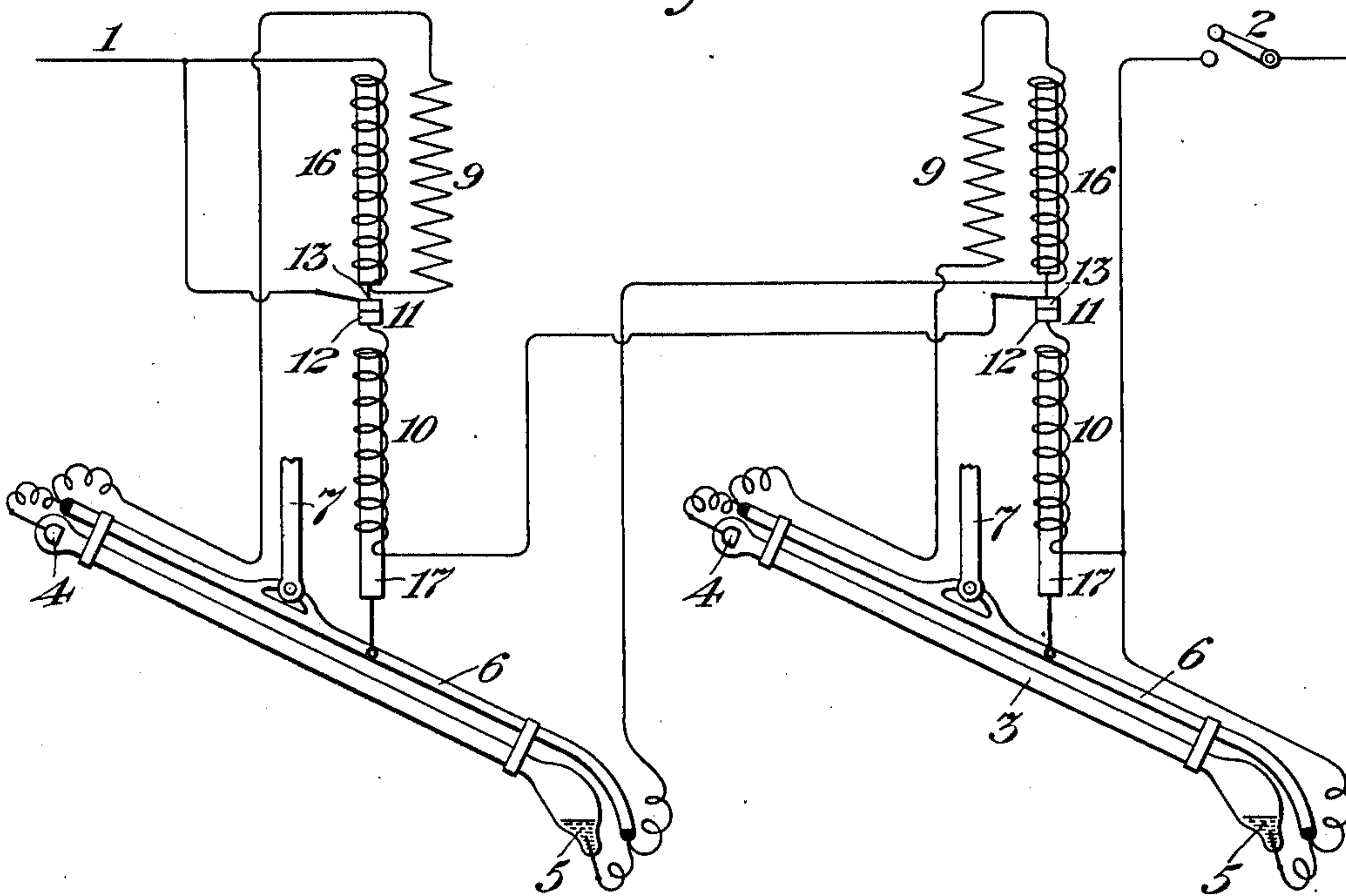
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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STARTER AND CIRCUIT FOR VAPOR DEVICES.

956,066.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed January 9, 1905. Serial No. 240,276.

To all whom it may concern:

Be it known that I, STANWOOD EDWARDS FLICHTNER, a citizen of the United States, and resident of Englewood, county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Starters and Circuits for Vapor Devices, of which the following is a specification.

A standard type of mercury vapor apparatus, represented by the well-known mercury vapor lamp, is now one in which the apparatus operates in a more or less inclined position, the starting of the lamp being accomplished by first bringing the electrodes into communication by a mechanical tilting of the apparatus and afterward releasing the apparatus to establish a flow of current through it. The described tilting and restoration of the apparatus has heretofore generally been accomplished by hand.

The object of the present invention is to provide automatic means whereby, on the closure of the main circuit, the lamp or other vapor device will be automatically tilted and restored. The invention is concerned also with the circuits and devices whereby such an automatic action may be readily accomplished, and is applicable to the starting of a single device or to a number of devices in series.

The invention is illustrated in diagrammatic views, Figure 1 showing the circuits adapted for operating a single mercury vapor lamp; and Figs. 2 and 3 showing different sets of circuits which can be utilized for starting two lamps in series.

Referring to the first figure of the drawing, 1 is a main conductor including a main switch, 2. The vapor apparatus is shown at 3, the same being provided in this instance with a solid positive electrode, 4 and a mercury negative electrode, 5. The lamp is supported upon a rod or bar, 6, which rod or bar is itself pivoted to a supporting arm, 7. The lamp may rest normally in substantially the position indicated in Fig. 1; that is to say, slightly off the horizontal.

The original path for the current at the time of closing the main switch 2 is through a resistance, 9, a solenoid or magnet, 10, a switch or cut-out, 11, having a stationary terminal, 12, and a movable terminal, 13, and thence to the circuit on the other side of the apparatus. In shunt to the solenoid or mag-

net 10 and the switch 11 is a circuit indicated by the conductor, 14, extending to the negative terminal 5 and a conductor, 15, passing through a solenoid or magnet, 16, into connection with the main line conductor. This shunt circuit is completed whenever the mercury is caused to extend from the positive electrode 4 to the negative electrode 5, which takes place when the lamp is tilted to or a little beyond a horizontal position in a reverse sense from that shown in Fig. 1. The conductors 14 and 15 may be supported on their way to and from the respective electrodes of the lamp by the rod 6. If the said rod is of conducting material, the conductors will be suitably insulated therefrom, say by special means or by the normal insulation of the surrounding conductors. If the said rod is of insulating or non-conducting material, there will be no need of care in respect to the insulation of the conductors 14 and 15. The solenoid or magnet 10 is placed in operative relation to a core or armature, 17, attached to the rod or bar 6 at one side of its pivot, as shown. The magnet or solenoid 16 is located in operative relation to the movable element 13 of the switch or cut out 11. Assuming now that the relations are such as have been described, the first action of the apparatus after the closing of the main switch 2 will be to lift one end of the rod 6 and the corresponding end of the lamp 3 through the action of the magnet or solenoid 10 upon its armature 17. This will tilt the lamp 3 sufficiently to cause a metallic contact to be made between the electrodes thereof through the flow of mercury from one end of the lamp to the other. Such metallic connection having been established the described shunt circuit will be closed causing the magnet or solenoid 16 to be energized and thereby lifting the contact 13 away from the contact 11 and breaking the original circuit. In this way the magnet or solenoid 10 becomes deenergized thereby releasing the core or armature 17 and allowing the lamp to fall by gravity to its operating position which is the same as that illustrated in Fig. 1. Stops, 18 and 19, may be provided for limiting the tilting of the lamp in opposite directions. Fig. 2 has substantially the same arrangement of circuits and the operation of the devices will be clearly understood from what has been already said respecting the operation of the single device

shown in Fig. 1. In this figure the current may be assumed to enter from the left hand side of the circuit 1, where it passes through the elements 9, 10, 12 and 13 to the second device where it also passes through the elements 9, 10, 12 and 13 to the main circuit once more. The passage of current through the path described leaves the two lamps, 3, 3, and causes a closure of the circuit inside the said lamps, after which the restoration of the lamp to operative position takes place as before.

Referring to Fig. 3, it will be seen that the original circuit contains the operating coils 10, 10 for lifting the lamps and is provided with cut-outs, 11, 11, operated by coils 16, 16. When this arrangement of circuits is provided, it will be seen that, if either of the cut-outs 11, 11, is operated so as to cause a separation of the terminal 13 from the terminal 12 thereof, then the original circuit is interrupted. This is a simplification of the circuit illustrated in Fig. 2. The resistance 9 and the coils 16 remain in the lamp circuit, although one of the coils 16 need not be made to act operatively upon either of the cut-outs.

In both arrangements of circuits the action described will be automatically repeated in case the single lamp or either of the series lamps should go out. Should the lamps fail to light at the first tilting operation, the circuit of the solenoids 10, 10, will not be opened and the lamps will remain in an inverted position. Attention would thus be directed to them and the operator would naturally open and close the main switch, repeating the operation as many times as may prove necessary.

The invention described herein is applicable to lamps or other vapor or gas devices whether the gas or vapor contained therein is mercury vapor or some other suitable gas or vapor.

I am aware of the Patent #794,745, issued July 18, 1905, to Recklinghausen. The present invention claims to accomplish the starting of a similar lamp by a somewhat different means which is found to be advantageous in many cases. For example, Recklinghausen's lamp utilizes a magnet in series and thus carries the operating current at all times. This requires the running po-

sition of the lamp to be different from its non-operating position. It further requires the tilting coil to be insulated and otherwise designed, so that it may properly produce or transmit momentary potential kicks that are required for the maintenance and operation of such lamps as they are frequently used. This is not wholly advantageous. On the other hand, applicant's arrangement provides a magnet and shunt which may be cut out during operation. Applicant's arrangement also provides for the same running and non-operating position of the tube. There are as well other advantageous differences between the two systems which will be obvious upon consideration and need not be here further described.

I claim as my invention:—

1. A plurality of gas or vapor electric devices serially operated and adapted to be started by tilting, in combination with a single shunt circuit for all of said devices containing suitable tilting magnets and an automatic cut-out for said shunt operated by the initiation of current through said devices.

2. A plurality of serially operated gas or vapor electric devices adapted to be started by tilting and a common shunt to said devices including individual tilting magnets therefor.

3. The combination with a plurality of vapor devices adapted to operate in an inclined position, of a common circuit for automatically tilting the said devices, and a common cut-out for accomplishing the opening of the tilting circuit thereby permitting the restoring of the devices to operative position.

4. The combination with a plurality of vapor devices, circuits and connections whereby the same may be automatically started, and a single common cut-out for the said circuits and connections.

Signed at New York, in the county of New York, and State of New York, this 27th day of December, A. D. 1904.

STANWOOD E. FLICHTNER.

Witnesses:

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