

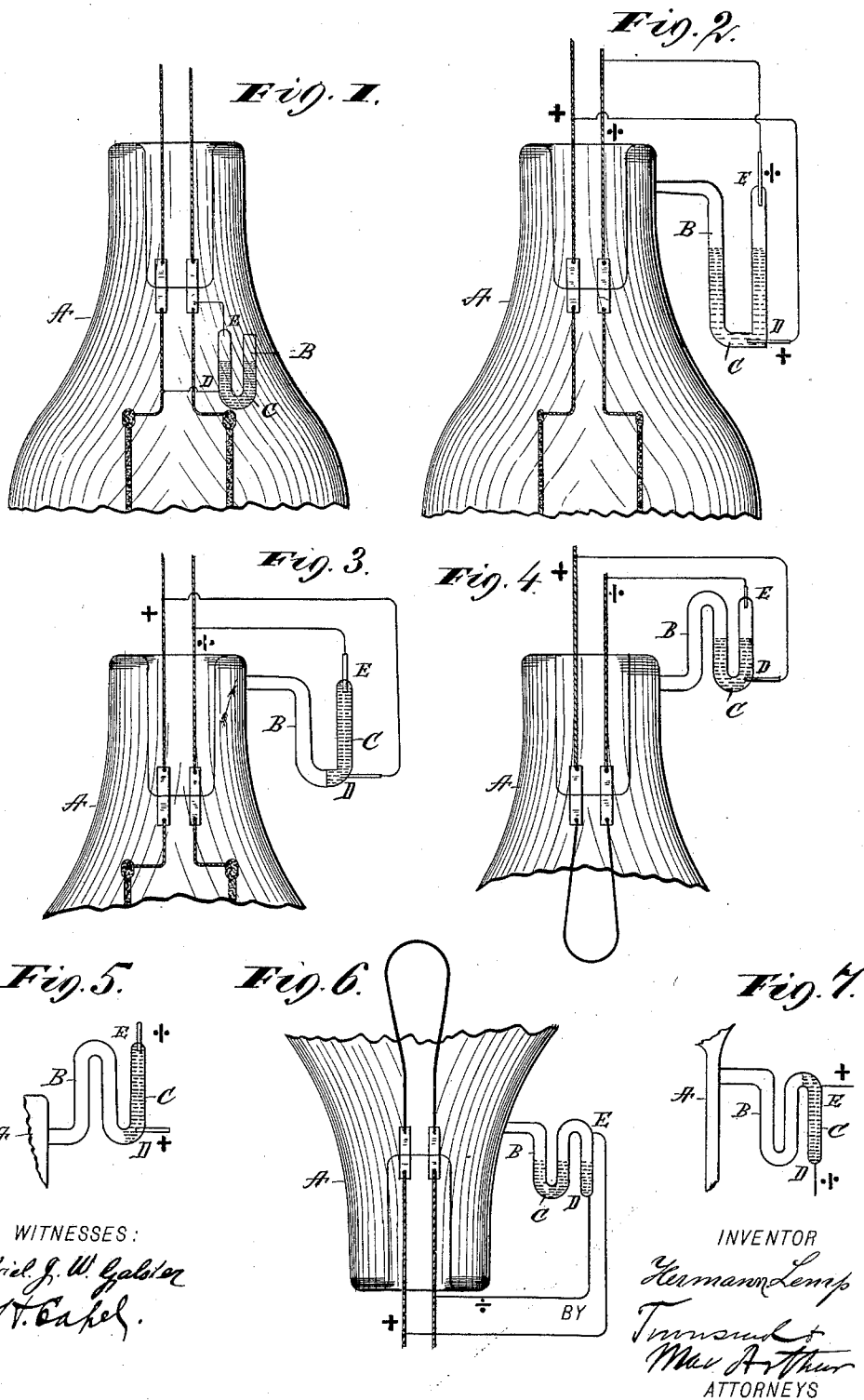
(No Model.)

2 Sheets—Sheet 1.

H. LEMP.
CUT-OUT.

No. 463,213.

Patented Nov. 17, 1891.



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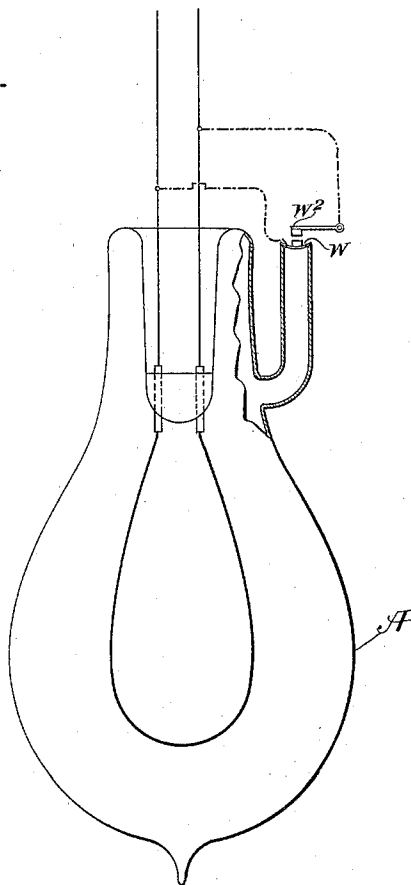
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Fig. 8.



ATTEST:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

HERMANN LEMP, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE SCHUYLER ELECTRIC COMPANY, OF CONNECTICUT.

CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 463,213, dated November 17, 1891.

Application filed June 21, 1887. Serial No. 241,997. (No model.)

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a certain new and useful Improved Cut-Out, of which the following is a specification.

My invention relates to incandescent lamps of that type wherein an incandescent filament forming part of a continuous conductor is sealed in an exhausted, or substantially exhausted, glass globe, tube, or bulb.

The object of my invention is to provide a simple and effective means for cutting out such a lamp from the working circuit on which it may be placed in case the vacuum in the lamp is destroyed either by the breaking of the globe and the admission of air thereto or by the generation of vapors within the lamp by the arc formed on the rupture of the filament.

To this end my invention consists in utilizing the abnormal pressure within the lamp, due to the admission of air or the generation of a gas therein, to close a short-circuiting device around the lamp. This abnormal pressure, due to either of the causes above mentioned, may be brought to bear upon any suitable device—such as a diaphragm, a body of liquid, or other equivalent device—which is held suspended in a state of equilibrium under normal conditions of the lamp, and which is actuated by the abnormal pressure within the lamp to close a short-circuiting contact. The device last mentioned I shall term for the purpose of this specification a “manometric circuit-closer.”

In the accompanying drawings, forming a part of this specification, I have illustrated two ways in which my invention may be carried into effect.

Figure 1 illustrates a lamp embodying my invention with the cut-out located entirely within the lamp. Fig. 2 illustrates a lamp embodying my invention with the cut-out located outside of the lamp. Fig. 3 is the same as Fig. 2 with the short-circuiting contact closed. Figs. 4, 5, 6, and 7 illustrate a modification of my invention. Fig. 8 illustrates a further modification.

In the drawings, A indicates a glass globe

or bulb of a lamp which is wholly or substantially exhausted of air, so that upon the admission of air thereto or the generation of a gas therein the tension within such globe is increased. The manometric circuit-closer is constructed as follows:

B is a bent glass tube communicating at one end with the exhausted bulb and sealed at the other.

C is a body of mercury in said bent tube making contact with one side of the circuit, as indicated at D, under all conditions of the lamp. The sealed end of the glass tube makes suitable connections with the other side of the circuit, as indicated at E. Under normal conditions the mercury standing at equal height in either leg of the bent tube makes contact only with one side of the circuit. When, for any reason, however, the tension within the glass globe is increased, as by the breaking of the globe and the admission of air thereto or the generation of a gas therein, the mercury is forced up toward the sealed end of the tube, thereby closing contact with the opposite side of the circuit and short-circuiting the lamp.

The bent tube may be located entirely within the globe, as indicated in Fig. 1, or it may be located outside the globe, as indicated in Figs. 2, 3, 4, 5, 6, and 7, the only condition to be observed being that one end of the tube shall communicate with the exhausted globe and the other end be sealed and contain a vacuum between the sealed end and the mercury or a pressure substantially equal to the pressure within the globe of the lamp under normal conditions.

The form of lamp shown in Figs. 1, 2, and 3 can only be used in connection with an upright lamp, as the mercury would escape if the lamp was overturned.

By providing the mercury-tube, however, with a double bend, as indicated in Figs. 4, 5, 6, and 7, the position of the lamp may be readily reversed, as will be apparent from inspection of the figures, in which Figs. 4 and 5 show the lamp in an inverted position, Figs. 6 and 7 in an upright position, the contact being open in Figs. 4 and 6 and closed in Figs. 5 and 7.

In Fig. 8 I have illustrated that modifica-

tion of my invention which involves the use of a diaphragm in place of a liquid column. The diaphragm indicated at W may be of any desired material, placed over an opening to
 5 a space communicating with the space within the lamp. The diaphragm is normally kept depressed or sunken by the weight of the outside atmosphere; but upon admission of air to the lamp the diaphragm moves out-
 10 wardly, so that a shunting-contact carried by it will establish a shunt connection, as shown by making contact with a spring W².

It will be understood that the glass globe of the lamp is so far exhausted of air that the
 15 expansion of the same will not serve to actuate the manometric circuit-closer, which is designed to be actuated only by the admission of air upon the breaking of the globe or the generation of vapor of high tension within
 20 the lamp.

I am aware of the patents to Edison, Nos. 214,637, 218,866, and 227,227, and make no claim to anything therein shown or described.

What I claim as my invention is—

25 1. The combination, with an incandescent lamp having an exhausted or substantially exhausted globe, of a normally open shunt around the same and a manometric circuit-closer normally communicating with the ex-
 30 hausted space and positively actuated by the pressure of air admitted to the lamp or gas generated therein to close and maintain closed said shunt, substantially as specified.

2. The combination, with an incandescent

lamp having an exhausted or substantially 35 exhausted globe, of a manometric circuit-closer normally communicating with the exhausted space and responding to increases of pressure within the lamp due to the admission of air or the generation of a vapor, and a shunt- 40 ing contact around the lamp normally open, but closed and kept closed by such increased pressure, substantially as specified.

3. The combination, with an incandescent lamp having an exhausted or substantially 45 exhausted globe, of a manometric circuit-closer consisting of a suspended body of liquid communicating with said globe and actuated by the admission of air to the globe or the generation of gas therein to close a shunt- 50 ing contact around the lamp.

4. The combination, with an incandescent lamp having an exhausted or substantially exhausted globe, of a manometric circuit-closer 55 consisting of a suspended body of conducting liquid communicating with said globe and normally in contact with one side of the circuit and adapted to be forced into contact with the other side of the circuit on the destruc- 60 tion of the vacuum within the lamp.

Signed at Hartford, in the county of Hartford and State of Connecticut, this 17th day of June, A. D. 1887.

HERMANN LEMP.

Witnesses:

R. E. DUNSTON,
 CHAS. E. DUSTIN.