

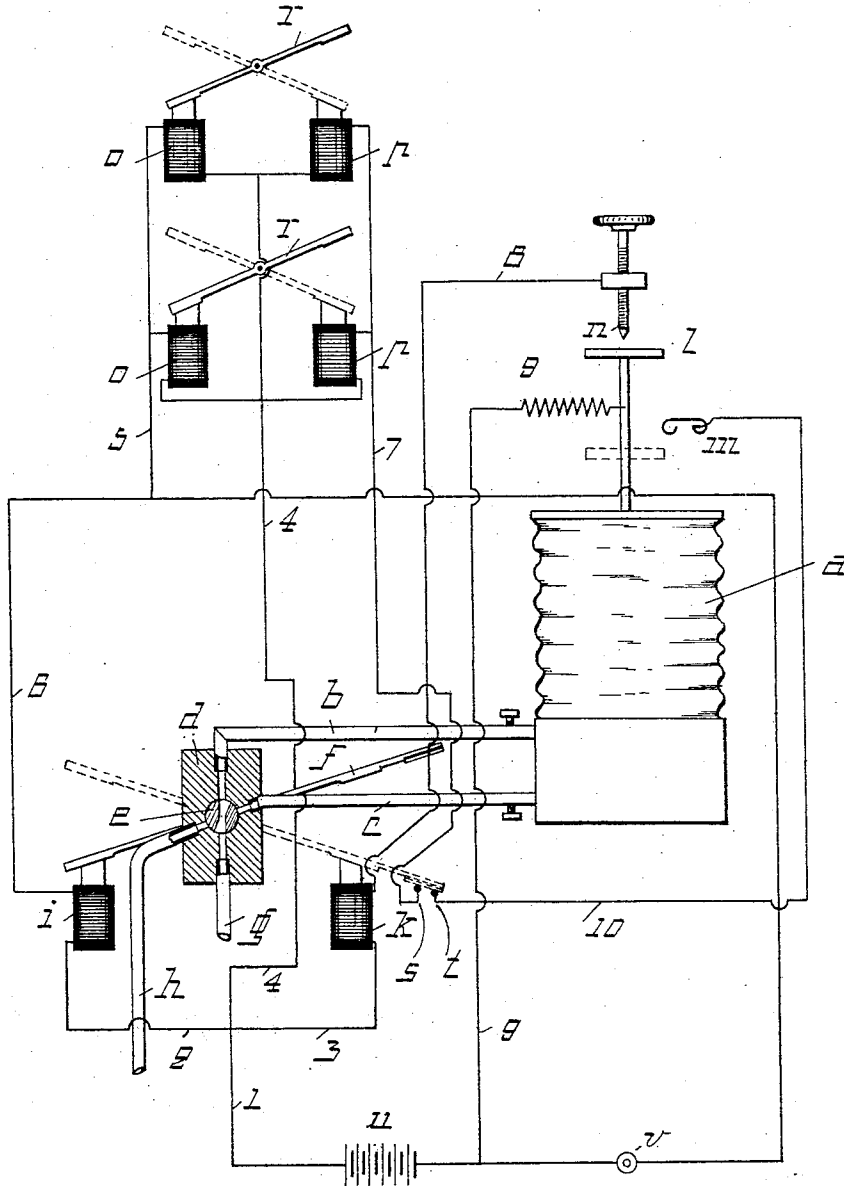
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APPARATUS FOR AUTOMATIC EXTINGUISHING OF LAMPS AFTER A CERTAIN TIME.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ERIK ARTUR FAGERLUND, a subject of the King of Sweden, and resident of Stockholm, Sweden, have invented certain new and useful Improvements in Apparatus for Automatic Extinguishing of Lamps After a Certain Time, of which the following is a specification.

This invention relates to an apparatus for kindling gas jets or incandescent lamps or the like and the automatic extinguishing thereof after a certain time.

The invention consists briefly therein that an electromagnet placed in an electric circuit at the closing of the current attracts an armature connected with a gas cock or such like, the gas being thereby admitted in a bellows of any suitable construction, which expands at the supply of the gas, by which a movable contact is displaced. This movable contact will in one position of the bellows engage a fixed contact, the current being thereby closed through another electromagnet which actuates the gas cock in opposite direction to the former one. The gas cock is hereby reversed and the interior of the bellows is put in communication for example with the open air so that the gas, in same can escape, the bellows resuming hereby its normal position. At the end of the movement of the bellows the movable contact will cooperate with a fixed contact, whereby a circuit provided with an electromagnet in each lamp is closed, said electromagnet actuating cocks or contacts in such manner that the gas supply or the current to the lamps ceases whereby the lamps will be extinguished.

The invention is illustrated on the annexed drawing, which shows the coupling scheme of the apparatus.

a indicates a bellows or the like, which by means of two tubes *b* and *c* is combined with a two-way-cock *d*, the plug *e* whereof is provided with an electromagnet-armature *f*.

g indicates a gas supply-pipe and *h* a gas outlet pipe which can open into the open air or at any gas-jet.

i and *k* are two electromagnets, located under each one of the arms of the armature *f*.

The bellows *a* is provided with a contact *l* which in the constructional form shown on the drawing is raised when the

bellows is being filled with gas and is lowered when it is being emptied.

m is a fixed contact, located so as to cooperate with the contact *l* as this one is near its normal position. *n* is another fixed contact, suitably in the form of an adjustable screw in a fixed nut, against which screw the contact *l* will press, when the bellows *a* is expanded on account of the gas pressure.

o and *p* indicate two electromagnets corresponding to the electromagnets *i* and *k* and arranged at each lamp, that is to be kindled or extinguished. These electromagnets actuate an armature *r*, which is combined with the plug of a gas cock, or with a switch if an electric light source is to be kindled or extinguished.

The electromagnet armature *f* connects, when occupying its normal position, indicated on the drawing by means of dotted lines, the two contacts *s* and *t* with each other.

u indicates a galvanic battery and *v* a push contact.

The different parts of the apparatus are connected with each other in the following way: The battery *u* and the push contact *v* are placed in a main circuit *1*, which on the one hand by means of the branch circuits 2, 3 and 4 is connected with the one pole of the electromagnets *i*, *k* and *o* and *p* respectively, and which on the other hand by means of the branch circuits 5 and 6 is connected with the other pole of the electromagnets *o* and *i* resp. The other pole of the electromagnet *p* is by means of the circuit *7* connected with the contact *s* and the other pole of the electromagnet *k* by means of the circuit *8* with the contact *n*. From the main-circuit *1* a branch-circuit *9* is drawn to the movable contact *l* and from the fixed contact *m* the circuit *10* is drawn to the contact *t*.

The manner of operation of the apparatus is the following:—At the pressing on the push contact *v* the current is closed through the main circuit and the branch-circuits 5—0—4 and 6—*i*—2. The armatures *f* and *r* will then occupy the positions shown by full lines, by which firstly the lamp at the armatures *r* is kindled, secondly the interior of the bel-

lows —a— is connected with the gas supply-pipe —g— by the pipe —b—. The bellows is then expanded the contacts —l— and —m— being firstly connected with each other, without any reversing taking place; as the contacts —s— and —t— are not connected. Finally, however the contact —l— will be connected with the contact —n—, the circuit $u-9-1-n-8-k-3-1-u$ being closed. The armature —f— is then reversed to the position indicated in dotted lines. Thereby firstly the contacts —s— and —t— will be connected with each other, secondly the interior of the bellows —a— is brought in communication with the outlet pipe —h—. The bellows is then emptied so as to lower the contact —l— this one finally being connected with the contact —m—. Hereby the circuit in $10-t-s-7-p-4-1-u-9-l-m$ is closed and the armatures —r— are reversed so as to extinguish the lamp attached to same. The apparatus has now resumed its normal position and can again be brought to action by pressure on the push contact —v—.

For regulating purposes the pipes —b— and —c— can be provided with screws, by means of which the channels can be more or less narrowed as well as the positions of the contacts —m— and —n— can be regulated.

On the drawing only two pairs of electro-magnets —o— and —p— and two armatures —r— are shown. In case a greater number of lamps is used, as usual in most cases, all the electromagnets —o— of these lamps are coupled in parallel between the circuits 4 and 5 and all the electromagnets —p— in parallel between the circuits 4 and 7.

What I claim is:

1. In an apparatus for the automatic operating of lamps after a certain time, a time measuring device, comprising an expanding body, a gas supply pipe, and an electrically operated organ, through which said supply pipe communicates with said expanding body.

2. In an apparatus of the character described, a time measuring device comprising an expanding body, a gas supply pipe communicating therewith, an electrically operated organ controlling the communication of the supply pipe with the expanding body, and a magnet controlled armature connected to and adapted to operate said organ.

3. In an apparatus for the automatic operating of lamps after a certain time, a bellows, a gas supply pipe communicating therewith, an electrically operated organ controlling communication between said pipe and bellows, and an armature co-operating with magnets connected to and adapted to operate said organ.

4. In a device of the class described, a bellows, a gas supply pipe communicating therewith, an electrically operated cock,

comprising a movable plug and an armature coöperating with magnets connected to and adapted to operate said plug.

5. In an apparatus of the class described, a bellows, a gas supply pipe communicating therewith, an electrically operated cock comprising a movable plug, controlling the communication between said gas supply pipe and bellows, an armature connected to said plug and a pair of electro-magnets, suitably positioned, whereby said magnets upon being respectively excited, cause the armature to oscillate therebetween, thus operating the plug to open and close communication between the gas supply pipe and bellows.

6. In an apparatus of the character described, a time measuring organ, comprising a bellows, a gas supply pipe communicating therewith, an electrically operated cock provided with a movable plug, an armature connected to said plug, a pair of electric magnets, suitably positioned, whereby when the respective magnets are excited the armature will oscillate between them, one of said magnets forming part of an electric circuit provided with a switch.

7. In a device of the character described, a time measuring device comprising an expanding body, a gas supply pipe communicating with said expanding body, an electrically operated cock, adapted to control the communication between said gas supply pipe and the expanding body, an armature secured to the said cock, and electro-magnets so positioned that when respectively excited the armature will be oscillated therebetween, in opposite directions an electric circuit, provided with a switch, one of said magnets forming a part thereof, and a second electric circuit, including the other magnet and provided with a switch which is operated by the expanding body.

8. In an apparatus of the class described, an expanding body, contacts secured thereto; and fixed contacts apart from said body, and adapted to coöperate with the contacts secured to said body.

9. In an apparatus of the character described, a time measuring device comprising an expanding body, contacts secured thereto, fixed contacts positioned at the limits of expansion and contraction of the time measuring device and an electric source, comprising poles, whereby the two sets of contacts coöperate at certain intervals, the contacts carried by the expanding body being connected with one pole of said electric source.

10. In an apparatus of the character described, a time measuring device, comprising an expanding body, contacts secured thereto, fixed contacts positioned at the limits of expansion and contraction of the expanding body, an electric source comprising poles, and an electromagnet, the contacts

secured to the expanding body are connected with one pole of said electric source, while one of the fixed contacts is connected with the other pole of said source through said electro-magnet.

11. In an apparatus of the character described, a time measuring device comprising an expanding body, contacts secured thereto, fixed contacts positioned at the limits of expansion and contraction of said body; an electric source comprising poles, and a switch the contacts secured to the expanding body, being connected with one pole of said electric source, and the fixed contact being connected by means of a switch with the other pole of said source.

12. In an apparatus of the character described, a time measuring device comprising an expanding body, contacts secured thereto, fixed contacts, positioned at the limits of expansion and contraction of the expanding body, coöperating therewith; an electric source; comprising poles, an electromagnet, and a switch, the contacts on said expanding body being connected to one pole of said electric source, while the fixed contacts are connected with the other pole of said source, one of them through said electro-magnet, acting upon an armature, and forming part of said switch, the other contact being connected to its pole through the switch.

13. In an apparatus of the character described, a time measuring device, comprising an expanding body, a gas supply pipe and a gas outlet pipe, a stop cock, a plurality of magnets an armature coöperating with said magnets and connected to said stop cock, whereby communication is alternately permitted between the expanding body and the gas supply and the gas outlet pipes.

14. In an apparatus of the class described, an expanding body, a gas supply and a gas outlet pipe communicating with

said expanding body, a cock, comprising a movable plug adapted to regulate the communication, alternately between the gas supply and the gas outlet pipe and the expanding body, an armature connected to said plug, a pair of magnets coöperating with the armature, electric circuits one of said magnets being in parallel in said electric circuit with a series of magnets in the lamps acting upon armatures in one direction, and a switch whereby the other magnet, by means of said switch, which is operated by the expanding body, is put into an electric circuit.

15. In an apparatus of the class described, an expanding body, a gas supply pipe and a gas outlet pipe communicating alternately with the expanding body; a cock, comprising a plug adapted to control the communication between the gas supply, the gas outlet pipe and the expanding body; an armature connected to said cock, two magnets coöperating with the armature, one of said magnets being in parallel in an electric circuit with a series of magnets in the lamps, acting upon armatures in one direction; and the other magnet being, by a switch operated by the expanding body, but into an electric circuit; said armatures in the lamp being acted upon in an opposite direction by means of a series of magnets, put in parallel in an electric circuit, provided with a switch, operated by the armature of the cock and a switch, operated at the normal position of the expanding body.

The foregoing specification signed at Stockholm, Sweden this 30th day of July 1908.

ERIK ARTUR FAGERLUND.

In presence of—

HJALMAR ZETTERSTROM,
HARRY ALBIHN.